UNIVERSITY OF PIRAEUS

Department of Banking and Financial Management

Postgraduate Program

THESIS

"Intra-Industry effects of European Bank M&A Announcements"

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List of the countries involved in our study

	AT	Austria	EMU
	BE	Belgium	EMU
	DE	Germany	EMU
	DK	Denmark	---
	ES	Spain	EMU
	FI	Finland	EMU
	FR	France	EMU
	GR	Greece	EMU
	IE	Ireland	EMU
	IT	Italy	EMU
	LU	Luxembourg	EMU
	NL	Netherlands	EMU
	NW	Norway	---
	PT	Portugal	EMU
	SE	Sweden	---
	SW	Switzerland	---
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	NW	Norway	---
	PT	Portugal	EMU
	SE	Sweden	---
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Brief review of this Thesis

We already know from numerous precedent studies, that bank Mergers and Acquisitions (M&As) generate strong positive valuation effects for targets on average (and possibly bidders engaged in the negotiations), while the evidence of the impact on acquirers is mixed.

Our study will be focused on neither bank acquirers nor bank targets of the M&As, but **on all the rival banks of the Target (**banks headquartered in the same country as the target bank of the M&A announcement**)**.

My objective is to determine whether the information coming from Bank M&A announcements is relevant to the valuation of the banks engaged in the M&A only, or it is transmitted to the other banks (referred to as rival banks) in the industry.

The rational hidden behind this theory is that Bank M&A announcements can signal prospects for the banking industry. Since the value of a bank is partially dependent on prospects of the industry, rival bank values can respond to a bank M&A announcement.

After calculating the effects of the Bank M&A announcements to the rival Bank Portfolios, we attempt to explain why the intra-industry effects, vary across M&A announcements (cross-sectional analysis).

We FOUND that European bank M&A announcements generate significant positive intra-industry effects, on average.

Our analysis of 218 European bank M&A announcements over the 1996-2001 period, confirms favorable intra-industry effects. Specifically, the Mean Portfolio Abnormal Return for the event window [-1,0] is 0.47% and rises up to 0.58% for the [-1,1] window. When examining only the 95 cases where the target was traded in a Stock Exchange, we got a Mean Portfolio Abnormal Return for the event window [-1,0] equal to 1% and 1.4% for the [-1,1] window.

This evidence suggests that the revaluation of all rival banks begins together with the announcement of the M&A.

After conducting a cross sectional analysis to the above results, we found that the intra-industry effects across bank M&A announcements are conditioned on event and rival bank specific characteristics. They are positively related to the valuation effects for the corresponding target bank, which implies that the degree of signal to the industry is conditioned on the degree of signal about the target bank. They are inversely related to the prior price performance of rival banks. Furthermore, the valuation effects are more favorable for smaller rival bank portfolios and for announcements with high Deal Value.

However, several characteristics didn't prove to be significant for the valuation effects noticed in the targets. These are the percent of shares of the target that according to the announcement will be acquired, whether the control of the target company is taken or not by the acquirer, the percent of individual rival Banks that are ultimately acquired in one year after the announcement of the event and whether we have a domestic or international M&A.

Finally, we rejected the hypothesis that the abnormal returns to rival banks of in-market mergers and acquisitions are positively related to the degree of concentration of the local markets. Thus, our evidence does not support the view that in-market acquisitions would have anti-competitive effects.

Overall, our analysis suggests that bank M&As transmit a signal about bank rivals, and that the strength of the signal is not only influenced by event-specific characteristics, but also by rival bank-specific characteristics.

The rest of the study is organized as follows: The introductory section describes what has happened in recent years by presenting the facts of M&A activity in the European banking sector, differences and similarities in M&A activity domestically and abroad; and M&As leading to the creation of financial conglomerates. This section also looks at concentration and capacity indicators and their relations to M&As. It focuses on the rationale for M&As (why they take place) and their implications for banks in terms of risks and advantages for the whole sector.

The main section describes the motive of our study, gives a detailed literature Review and a thorough description of the followed Methodology. The focus is given on the Intra Industry Effects of the M&A Announcements and on their Cross-Sectional Analysis.

Introducing European Bank M&As

In this analysis, we study Mergers and Acquisitions (M&As) involving the European banking sector over a five year time period (1996-2001). The questions discussed in this theoretical section are : "**what**" happened, "**why**" and "**how**" did it happen, and "**what are the implications**" of these European Bank M&As*.

From a historical point of view we observe that until the 1980s the financial industries in most EU Member States operated in highly regulated markets and government ownership played a more significant role. The market for corporate control was less developed at that time. A bias existed towards stability of ownership structures and cross-shareholdings in some countries. At the same time, markets for banking services were predominantly local by nature. All in all, the environment prevailing until the 1980s limited M&As as efficient ways to change the strategies of relevant players and the structure of the market.

In the late 1980s and 1990's, the European banking sector experienced two significant Merger and Acquisition waves (M&As). Both waves appear to be largely related to the increasing integration of the European economies, which are a direct result of the European Union integration strategy. In particular, the *Second Banking Directive***, issued in 1989 and implemented in January 1993, tried to remove most of the barriers to cross-border bank mergers. It introduced the idea of a single banking license that is valid throughout the European Union. The 'relevant market' was expanded to include the whole Union. The creation of the European Monetary Union has further reduced barriers because it has put all banks of the participating countries under the supervision of the European Central Bank. Besides that, the introduction of the EURO has eliminated exchange rate risk within the EU and has made it easier for customers to compare prices of services between banks in different countries.

So, in the last two decades, we observe great changes in the banking industry. M&As are changing the structure of the European banking sector. However, they are not a driving force for change themselves. M&As are responses to the driving forces for change and to changes in market structures. The major forces driving these

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* *This introductory analysis contains quantitative and qualitative information from central banks and banking supervisory authorities (such as the Banking Supervision Committee of the European System of Central banks), gathered and evaluated under the provision of ECB.*

** *Directive 89/646/EEC.*

changes are : national deregulation, integration of international capital markets, dis-intermediation, demographics, information technology, entry of new competitors, and particularly the creation of the Euro, that can create the need for larger size to operate on capital markets. Larger size, with a large capital will facilitate underwriting and trading in specific segments of the capital markets. All the aforementioned reasons, along with the expected bank attempts to exploit potential synergies, economies of scope and scale*, and other benefits, will further increase competition between the European banks.

Historical Background on European Bank M&As

The M&A activity in Europe shows different patterns depending on the market sectors (mutual banks, publicly owned banks, savings banks), the size of the market and thus the relative size of the institutions by international comparison. The EU countries have also, in the past, experienced their own specific pace and history of banking system re-structuring. Before studying the recent developments, some of these patterns may be recalled since they can, to an extent, explain these recent developments.

During the late 1980s and early 1990s a restructuring and concentration process took place in a number of smaller EU countries such as NL and DK. This process led to the creation of large national institutions, ready to compete in the Single Market or a regional part of it. In the early 1990s, in the wake of the Scandinavian banking crisis, M&As to create large institutions took place in SE and FI. The UK banks were not as small in international comparison, but a cycle of M&As also took place in the late 1980s and early 1990s. In Spain, a similar process took place during the early nineties, involving especially savings banks. In the same period in many countries, privatization efforts were pursued, in the wake of which many publicly owned banks were sold to private investors. Moreover, a tendency arose for institutions with a mutual ownership structure to "demutualise"; in some countries (such as the UK and IE and, to some extent, DK and DE) institutions (e.g. building societies and savings banks) that had a mutual ownership organisation abandoned this organisational form and converted their corporate ownership to other private legal forms. Both privatisation efforts and "demutualisation" have increased the scope for M&As by increasing the number of institutions that can legally participate in M&As.

* *The economies of scale are important, but the most significant factor of competitive advantage in a Bank M&A, is not scale but operating efficiency.*

The Economic Rationale for Bank M&As

A large literature has reviewed the various motives for bank mergers and acquisitions (Hawawini-Swary (1990), Pillof-Santomero (1997) and others). In principle, the decision to merge or acquire a firm should be motivated by the desire to increase the wealth of shareholders of the acquiring firm. But agency conflicts between shareholders and managers could also lead to situations in which the decision to acquire is motivated by the managers' self interest.

What can the Banks involved in a MorA gain?

Answering to the above question, we will be able to better understand the reasons for European Bank M&As, and together with a basic knowledge of the European Economic environment, we will be able not only to understand but also to predict the direction of all the forthcoming changes in the European Banking Sector.

The eleven main motives, of M&As the Banking Sector are:

1. Cost-based Economies of Scale : Cost efficiency is achieved by lowering average cost per unit of output through expanding a single line of business.

2. Brand-based Economies of Scale : Large size will allow to obtain brand recognition at a lower cost . This is a special type of cost-based economies of scale, related to marketing costs per unit of product sold. The strategic importance of brand (which does not yet exist in banking, is often recognized as a potential key source of competitive advantage in the future, when consumers of financial services will shop on the Internet.

3. Revenue-based Economies of Scale : Size and a large capital base will allow to underwrite large loans or securities issues, having a positive impact on the demand for underwriting services. In the context of the Euro and integrated capital markets, size will be one source of competitive advantage on capital markets.

4. Safety net-based Economies of Scale : As a bank becomes very large, it is more likely to be qualified as 'too big too fail" by the public authorities. This would provide a competitive advantage in terms of both a lower funding cost for a given level of capital

and risk, and larger positions accepted by counterparties. The systematic bailing out of insolvent banks in Europe is documented in Goodhart-Schoenmaker (1993). Boyd-Graham (1998) have expressed great concern that many of the bank mergers in the United States were creating large "too big too fail" banks.

5. Cost-based Economies of Scope : Cost efficiencies achieved by offering a broad range of products or services to a customer base. They could originate from the large fixed costs incurred in gathering an information database or a computer equipment which can be used to provide a large set of services.

6. Sales (revenue)-based Economies of Scope: The hope of cross-selling new products to an existing customer base. This relies on the assumed preference of investor for one-stop shopping. The case of banking and insurance products is often quoted. It must be noted that doubts have been expressed about the preference of consumers for one stop shopping in the case of the merger between Citibank and Travelers (Hamel (1998) and Authers (1998)).

7. Financial diversification-based Economies of Scope : Standard portfolio theory shows that a portfolio of imperfectly correlated risks will reduce the overall volatility of profit. According to Pilloff-Santomero (1997), lower volatility may raise shareholder wealth in several ways. First the expected value of bankruptcy costs may be reduced. Bankruptcy costs refer in large part to the loss of franchise value resulting from a default. Second, if the firm faces a convex tax schedule, then expected taxes paid may fall. Third, earnings from lines of business where customers value bank stability (the case of long term customer relationship) may be increased. Finally, levels of certain risky activities, barely profitable, could be increased because the necessary amount of capital would be reduced.

The argument is that a business exhibiting a low correlation with an existing portfolio of business will have a low marginal risk, therefore creating the need for a lower capital requirement and a lower threshold of acceptable earnings. Financial diversification can be obtained through the offering of a range of products, to servicing different customers groups, or through spreading credit risk across industries or regions. The assumption here is that firm-based diversification is more efficient than diversification purchased on the market.

8. X-Efficiency : X-efficiency refers to the fact that given a current volume of output, a firm is not operating with maximum cost efficiency, i.e. it has a too high cost structure. This source of efficiency is often cited as the prime motivation for domestic merger, as two banks merging can more easily coordinate the reduction of the size of a too large branch network.

9. Market Power : Horizontal merger which reduces the number of firms operating into one market may lead to less competition and higher margins. Mergers across industries may allow higher profit due to *tying* strategies which allow the firm to package a bundle of goods.

The first nine motives were discussed from a perspective of increasing the value of shareholders' wealth. One can notice that, in some cases, the increase in wealth of shareholders does not correspond to a social optimum. Exploiting the benefits of a public safety net or market power will create economic inefficiencies. Moreover, agency conflicts between management and shareholders could lead managers to attempt to increase their own expected utility.

10. Defense-based Economies of Scale : Achieving size (capital clout) that acts as a defensive measure against takeover.

11. The 'quiet life' or hubris hypotheses : The argument is that higher profit driven by economies of scale or market power can be captured by management in the forms of higher salaries, perks or reduction of risk (the 'quiet life' hypothesis). A special case is the *hubris* hypothesis according to which management because of arrogance (hubris) or overweening pride will overstate the gain from a merger, ending up by overpaying target firms (Roll,1986).

Bank M&As Types

Four different types of M&As have been distinguished in this report: domestic and international bank M&As and M&As leading to domestic and international conglomeration*.

The analysis of M&As has been carried out following, as a rule, a matrix capturing the industry sector and country dimensions as follows :

Between credit institutions	**Domestic bank M&As** M&As involving credit institutions located in the same country.	**International bank M&As** M&As involving credit institutions located in different countries, one of which is an EU country.
Across sectors	**Domestic conglomeration** M&As between credit institutions and insurance companies and/or other financial institutions all located in the same country.	**International conglomeration** M&As between credit institutions located in an EU country and insurance companies and/or other financial institutions located in another country.

In the following pages we will analyse all Bank M&A categories. We will also cite some numerical figures obtained by several ECB studies. Whenever we do so, we mark our text with the ECB Logo Picture.

* *i.e. the process leading to the creation of groups of financial companies operating in different sectors of the financial industry.*

Domestic bank M&As

In summary:

⇨ Domestic M&As mainly occur between smaller institutions, indicating a mop-up of excess capacity.

⇨ Consolidation of smaller institutions is a phenomenon observed during the whole period.

⇨ M&As of large institutions are increasing both in absolute and relative terms, thereby affecting the market structures in some Member States.

⇨ The number of M&As was clearly higher in 1998 and 1999 compared with the three previous years and upward shifts in values of M&As have been observed in a number of countries, indicating a wave of mergers among larger institutions.

Information about the value of M&As is available to a limited extent only. The possible effect of M&As on domestic market structures has been estimated by relating the assets of the new institution(s) to the total assets of the banking system. A large percentage of assets involved in M&As tends to indicate an involvement of large domestic players, which, when they are involved, will have a larger influence on the market structure than small institutions. The effect on regional retail clients may be equally important in case of M&As between small regionally specialized institutions, but the overall competitive effect on the market will, ceteris paribus, be larger when the size of the institution increases.

For domestic M&As larger values tended to be involved during the period from 1995 to 1998, indicating that it is not only the very small institutions that are involved in M&As, at least on an aggregate basis. A development of increased values may therefore have taken place. There are, however, large differences among EU Member States, both at the level of banking assets involved in M&As and in the trends towards either increases or declines. Upward shifts in the values have been observed in AT, BE, DE, FR, IT and LU, but with assets ranging from less than 5% of banking assets involved in DE to more than 50% in FR in 1999.

Around 30% of banking assets were involved in domestic bank M&As in 1998 in FI and GR, whereas a figure of 20% was observed for ES in 1999. From 1996 to 1999 percentages were between 20% and 60% in French mergers. Lately, all these markets have thus undergone quite some changes. Clear downward movements in relation to values (and numbers) have occurred in PT and SE. More than 40% of Swedish banking assets were involved in domestic M&As in 1997.

International bank M&As

In summary:

- Far fewer international bank M&As have taken place than domestic bank M&As.
- Measured by number, international bank M&As were mainly outside the EU area.

In absolute terms international bank M&A activity accounted for far fewer operations than domestic bank M&A activity in the EU during the period from 1995 to 1998. The operations were carried out by way of acquisitions and not mergers. Acquisitions also represent larger deals than mergers.

With regard to the values of international M&As, whether within the EEA or with third countries, even less information has been available than on domestic M&As. Again, the measurement is the outstanding amount of domestic assets involved in M&As. This measurement does not provide information about the size of the third country institution, which might therefore be a small regional bank or a bank such as Bankers Trust (taken over by Deutsche Bank).

It should be noted that singular large deals may result in very significant amounts of assets being involved. For example, a deal like the creation of MeritaNordbanken in 1998 involved almost 50% of Finnish domestic banking assets. The holding company of MeritaNordbanken acquired Unidanmark in the first half of 2000. This deal was reflected in the Danish figures (as an acquired institution) as well as in both the Finnish and the Swedish figures (as an institution acquiring an EEA institution). In DE 29% of banking assets were involved in EEA acquisitions in 1995 and between 12% and 24% from the beginning of 1997 to 1999. Elsewhere, M&As within the EEA have involved banking assets of almost 10% in ES in 1996 and more than 10% in IE in 1995 and 1997.

As for M&As with institutions located in third countries, which have outnumbered M&As within the EEA, ES is an important and stable investor, and between 17% and 26% of domestic banking assets were involved during the whole period under observation. The large banks in DE have also expanded into third countries and between 13% and 35% of assets were involved during the observation period. In 1995-97 and the first half of 1999 more than 10% of Irish banking assets were also involved in third country acquisitions, whereas the Dutch banks entered into international bank M&As with between 24% and 44% of Dutch banking assets from 1998.

Development of financial conglomerates

M&As leading to the establishment of a financial conglomerate are qualitatively different from pure banking M&As, since they lead to the creation of a group which is active in different sectors of the financial industry. The largest and/ or "leading" company in a conglomerate may be a credit institution, an insurance company, a holding company or another financial institution.

Financial conglomerates may be created by way of M&As or by a financial institution setting up a company in another sector, e.g. a bank setting up an insurance company to expand into the insurance sector. The creation of a financial conglomerate is not the only way of offering financial services of different character in a jointly organised way. Co-operation agreements between, for instance, a bank and an insurance company may achieve similar results. Such co-operation agreements are common in many Member States. They are often found to be precursors for integration involving ownership elements.

Similar to, but different from conglomeration, is the establishment of jointly owned enterprises offering specialised financial services. In some Member States savings banks and co-operative banks have set up such jointly owned enterprises that provide asset management, stock-broking and settlement activities as well as insurance, all of which are sold to or distributed by the member institutions of the sector. An example would be the jointly owned investment management firm of the savings bank sector in a country. In economic terms, such jointly owned enterprises provide equal opportunities of marketing and servicing as financial conglomerates. The development of such enterprises as well as co-operation agreements is common, e.g. in countries such as Austria and Germany, with specific sub-sectors of the banking industry involved, e.g. savings banks and co-operative banks.

Domestic conglomeration

In summary:

⇨ Throughout the observation period domestic conglomeration was driven by credit institutions.

⇨ Credit institutions are mainly expanding into asset management and the business of investment services in general. Furthermore, such conglomerates seem to be the most widespread form of conglomerate. In most countries most of the asset management and investment services activities are provided by credit institutions.

In the observation period, credit institutions expanded far more actively into other sectors of the financial industry than did other financial institutions into banking business. This may be due to the barriers to entry, historically, being higher in banking than in insurance. It may also be due to the fact that in many Member States the banking industry is far more developed and larger than the insurance industry.

International conglomeration

In summary:

⇨ It seems that international conglomeration is initiated by credit institutions expanding outside the EEA into, in particular, the business areas of other financial institutions.

⇨ The international expansion has occurred by way of setting up new enterprises and through M&As in a rather balanced way.

⇨ Looking more closely at the breakdown of mergers and acquisitions, acquisitions outnumber mergers.

⇨ There is little international conglomeration activity involving insurance companies.

Banks have also been more actively expanding into other sectors on a cross-border basis than other financial service providers have been into banking. The expansion has been mainly into the business area of other investment services.

M&As related to Concentration and Capacity

Developments in concentration may be attributed to M&As, whereas capacity is likely to be influenced by other factors as well, i.e. the setting-up of new companies, technology and labor market conditions. In addition, there will be an immediate effect on concentration, especially if M&As are between large institutions, whereas there is usually a time lapse of a couple of years before rationalisation is effected and capacity, as measured by the number of branches and employees, is reduced.

Concentration

Concentration is measured by two different methodologies. The simplest methodology is called CR5 - or concentration ratio 5 - and is a measurement of the combined market share of the five largest institutions. A more advanced methodology is the Herfindahl indicator, which is described right below.

The Herfindahl indicator

The Herfindahl indicator (HI) measures concentration in a market. The similarity between HI and CR5 is that both indicators take the largest institutions mostly into account. The HI achieves this because the importance of the largest institutions is emphasised through the calculation of this indicator, which is equal to the sum of squared market shares, whereas the CR5 takes into account the effective market share of the five largest institutions. The difference is that the HI signals the size structure of the entire banking market, whereas the CR5 only shows the market share of the five largest banks, thus ignoring the size structure in the rest of the market. In other words, the HI takes the so-called tail of institutions into account, by including the entire market, whereas the CR5 disregards institutions other than the five largest. Another disadvantage of the simple concentration ratio (CRx) is that the setting of the number for the x-largest institutions is arbitrary. Often, CR indicators are for the three, four, five or ten largest institutions. Such distinctions may have a huge impact on the level of the indicator. This drawback does not apply to the HI, since it captures everything (the whole market) in one number.

The CR5 lends itself immediately to interpretation whereas the Herfindahl indicator is, at first sight, somewhat more difficult to "read". The basic assumption is that an HI above 0.18 would be equal to high concentration. A more simple interpretation is that a market with an HI of 0.2 has the same HI as a market equally shared between five banks (the inverse of 0.2).

CR5 – assets of five largest credit institutions as a percentage of total assets

									%-change	
	1980	1985	1990	1995	1996	1997	1998	1999	1990-99	1995-99
AT		35.88	34.67	39.19	38.96	48.25	50.07	50.39	15	29
BL	54.00	48.00	48.00	51.20	52.20	53.90	72.50	77.39	61	51
DE			13.91	16.67	16.08	16.68	19.15	18.95	36	14
DK	62.00	61.00	76.00	72.00	72.00	72.00	76.00	77.00	1	7
ES	n.a.	35.06	34.91	47.30	46.00	45.20	41.60	51.90	49	10
FI	37.00	38.00	41.00	70.62	71.74	72.72	73.51	74.33	81	5
FR		46.00	42.50	41.30	41.20	38.00	39.20	42.70	0	3
GR	n.a.	80.56	83.70	75.66	71.49	71.77	72.77	76.62	-8	1
IE	59.10	47.50	44.20	41.10	42.20	40.70	40.10	40.79	-8	-8
IT			29.19	32.36	32.11	30.71	38.73	48.33	66	49
LU	51.06	26.83		21.23	21.81	22.43	24.58	26.09	n.a.	23
NL		72.88	73.39	76.11	75.36	79.42	81.69	82.25	12	8
PT	60.00	61.00	58.00	71.00	80.00	76.00	75.22	72.60	25	-2
SE		80.81	82.68	86.53	86.52	86.80	85.65	88.21	7	2
UK				28.27	29.14	28.28	27.75	29.07	n.a.	3
W.	37.90	52.79	50.93	51.79	51.99	52.19	51.77	57.11		

Generally, both the CR5 and the Herfindahl concentration indicator show the same picture. The level of concentration is highest in the small countries, except for IE and LU (owing to the presence of many foreign banks) and for AT (with a large number of small credit institutions). In FR deposit concentration is equal to that in the small countries. This is partly driven by the so-called "popular savings products", which form a large part of the deposits and are distributed by a few networks only (such as the Crédit mutuel or the savings banks). Another reason is the coverage of territory by mutual banks (like Crédit Agricole), which may present an advantage in the collection of deposits.

The development in concentration shows that the level of concentration increased from 1995 up until end-1999 in most countries and, in particular, in AT, BE, DE, ES, IT and LU. The increased concentration corresponds closely to the M&A activity in BE,

DE and IT. M&As in BE have, in particular, involved large institutions, and the Belgian market today resembles more the structure of other small countries in the EU.

Herfindahl Index	1995	1996	1997	1998	1999	2000
AT	0.0437	0.0445	0.0831	0.0983	0.1016	0.1107
BE	0.0637	0.0670	0.0700	0.1310	0.1552	0.1882
DE	0.0093	0.0100	0.0112	0.0134	0.0136	0.0144
DK	0.1211	0.1186	0.1164	0.1337	0.1363	0.0141
ES	0.0528	0.0503	0.0496	0.0488	0.0716	0.0899
FI	0.1786	0.1793	0.1814	0.2041	0.1910	0.1842
FR	0.0421	0.0437	0.0449	0.0485	0.0509	0.0567
GR	0.1778	0.1664	0.1534	0.1539	0.1513	0.1550
IE	0.0650	0.0580	0.0500	0.047	0.0480	0.0490
IT	0.0340	0.0313	0.0308	0.0409	0.0600	0.0688
LU	0.0178	0.0193	0.0202	0.0224	0.0237	0.0255
NL	0.1603	0.1536	0.1654	0.1802	0.1700	0.1757
PT	0.1397	0.1491	0.1299	0.1307	0.1234	0.1846
SE	0.1950	0.2000	0.2040	0.2010	0.1951	0.1940
UK	0.0191	0.0206	0.0207	0.0216	0.0263	0.0275
Average	0.0880	0.0874	0.0887	0.0984	0.1012	0.1025

Source: Sandrine Corvoisier, Reint Gropp (2001). "Bank Concentration and Retail Interest Rates" ECB, Working Paper Series.

One country that does not correspond to the general development among the small countries is GR, where concentration is declining in all three categories. Against a background of high M&A activity in GR, the explanation is that M&As have mainly involved small to medium-sized institutions, which, at the same time, expanded their business faster than the largest institutions.

Capacity

The number of credit institutions fell in most Member States from 1995 to 1999. Exceptions are IE, where the entry of foreign banks has led to an increase; Greece, where new institutions have been established, mainly in the form of co-operative banks; and PT, where there was no change.

The reduction in most countries can be attributed to M&As, but other forms of market exit (such as liquidation) may also have contributed to the reduction. The pace at which the reduction in the number of credit institutions is taking place seems not to have changed significantly during the observation period in spite of an increase in the number of M&As.

Capacity – number of credit institutions

									%-change	
	1980	1985	1990	1995	1996	1997	1998	1999	1998-99	1995-99
AT	1,595	1,241	1,210	1,041	1,019	995	971	951	-21	-9
BE	176	165	157	145	141	134	129	119	-24	-18
DE	5,356	4,740	4,720	3,785	3,675	3,577	3,493	3,167	-93	-16
DK	197	166	124	122	125	120	105	109	-12	-11
ES		695	694	384	434	412	396	383	-45	-21
FI	669	654	529	381	373	371	359	352	-33	-8
FR		2,109	2,027	1,445	1,382	1,273	1,209	1,143	-44	-21
GR	30	38	41	52	55	55	57	54	32	2
IE	61	58	48	56	62	70	77	80	67	43
IT	1,156	1,492	1,156	970	937	935	921	876	-24	-10
LI	11	18	17	220	221	215	209	210	19	-5
NL		81	111	102	101	100	100	101	-9	-1
PT	35	224	260	252	228	235	229	253	-10	0
SE		543	498	119	124	124	121	123	-75	3
UK	649	655	624	578	555	551	527	494	-21	-15

The rationale for Bank M&As. Why do they occur? Headlines of empirical literature on scale & scope economies.

Most empirical literature is based on evidence from the US. Fewer studies have been performed in Europe, but they have to a large degree reached the same conclusions, which can be summarised in the following points:

⇨ Banks in more concentrated markets usually charge higher rates on small business loans and pay lower rates on retail deposits. Developments in recent years, such as 1) new delivery channels making local markets more contestable, 2) deregulation increasing competition in local markets and 3) products becoming commodities, thereby making competition more perfect than in the past, may, have changed the market power.

⇨ Market power studies that take into account institutions that have recently engaged in M&As show mixed results. The same applies to studies that examine profitability of institutions before and after M&As, compared with similar institutions that did not engage in such activities.

⇨ Studies of economies of scale are able to identify a threshold at which these can be achieved. More recent studies tend to show that the level of the threshold is increasing compared with previous studies. The most obvious reason for this observed upward shift in the optimum size lies in new technologies. Technology is found to change the cost structure tangibly. Regulatory changes, having created larger markets like the lifting of restrictions on inter-state banking in the US and, within the EU, the creation of the Euro area, may also play a role.

⇨ Studies generally fail to find economies of scope. Finding the appropriate benchmark (a provider of only one product or service to offer the required cost or revenue function) is a general problem in relation to these studies. The use of one network for distributing a variety of products seems, however, appealing, if the network already exists.

⇨ Studies have shown that inefficiencies are common among banks and that domestic mergers among equally sized partners significantly improved the performance of the merged banks to reach X-efficiency*. Efficiency may therefore be a factor of greater relevance than economies of scale and scope. It should be noted, however, that X-efficiency is not achieved "automatically" but rather through diligent attention to input and output factors. In this context, M&As represent excellent occasions to reorganise the activities of banks to achieve a higher efficiency.

** X-efficiency is reached when, regardless of the scale of operation, input use is in line with the best practice of the industry, i.e. there is no waste of inputs given the level of outputs.*

The rationale for Bank M&As. Why do they occur? Views expressed by the EU industry.

Examining the motivation for M&As from an industry perspective we concluded that the pursuit of increased profitability prevails as a motive while cost benefits from economies of scale are expected in domestic bank M&As. (International) conglomerates are created following anticipated revenue benefits from economies of scope. The cost benefits are known because they can be assessed on the basis of knowledge of cost structures in the present business area combined with insight into historical annual nominal costs (i.e. through internal cost accounting or in-house management systems), whereas the expected revenue benefits will be based on cross-selling possibilities and expectations of market developments. All in all, costs savings thereby seem more concrete than revenue benefits, which are much more elusive.

The table below sets out the main elements identified in the analysis of the rationale for the four categories of M&As.

Main motives and possible rationalisations for the four types of M&As

	Within one country	**In different countries**
Between credit institutions	**Domestic bank M&As** Economies of scale linked to costs are the main motive. Cutting distribution networks and administrative functions (rationalisation), including information technology and risk management areas.	**International bank M&As** Size, i.e. the need to be big enough in the market, is the main motive. Matching the size of clients and following clients. Possible rationalisation within administrative functions.
Across different sectors	**Domestic conglomeration** Economies of scope through cross-selling are the motive. Risk and revenue diversification. Optimum usage of complementary distribution networks. Possible rationalisations within administrative functions may lead to economies of scale linked to costs.	**International conglomeration** Economies of scope through cross-selling together with size are the two main motives. Risk and revenue diversification. The M&A offers few rationalisations because institutions are in different countries and subject to different regulations and practices.

Domestic bank M&As

Economies of scale are the main rationale for "small" bank M&As. The small institutions aim to achieve critical mass to explore synergies arising from size and diversification. These M&As are clearly related to cost reductions that are realised by cutting branch networks, staff and overheads in central head-office functions such as information technology departments, macroeconomic departments and legal departments. M&As are also used to avoid takeovers.

"Large" bank M&As often reflect a repositioning of the institutions involved. The pursuit of size increases, reflects the perceived need to become big enough for the domestic market. Economies of scale also play a role. Banks aim at increased market power and a larger capital base, and thus there is a larger focus on increasing revenue than for the small institutions. The same cost reductions are followed as in small M&As. Together with the possibility of selling off peripheral business areas, the M&A offers the advantage to owners of optimisation of the capital structure, and thus increased shareholder value.

International bank M&As

These M&As are mainly motivated by size - the need to be big enough for the regional or global market. It is, however, not only the size of the institution itself, but also the size of clients that plays a role, thereby further emphasising the repositioning argument and the aim of achieving access and presence in a larger market. Banking groups follow the internationalisation and consolidation in the industries of their clients. Next to size, both economies of scale and scope have been cited as objectives.

Another reason is economies of scale linked to cost reductions, although rationalisations are less obvious than for credit institutions in the same country owing to different regulatory requirements and/or market structures. The new institution will have a larger customer base in a larger market, increasing possibilities for economies of scale linked to increasing revenue and the possibility of reaching the critical mass needed to offer specific services, like, for instance, worldwide asset management. Acquisitions in emerging markets allow the transfer of knowledge and capabilities, leading to cost and revenue efficiency in the new entity.

In some Member States with high concentration, cross-border M&As may be driven by expectations among bankers that further national consolidation of large institutions would trigger opposition from anti-trust authorities.

Domestic conglomeration

Economies of scope are the predominant motive for domestic conglomeration. The critical issue is achieving the expected cross-selling of different financial products to the larger customer base brought together from the institutions involved. It is the revenue side that is at the core of the economic rationale, implying an efficient use of the existing distribution channels. By bringing together skills from different sectors, a two-fold achievement is expected - to respond to the disintermediation process within the conglomerate, thereby capturing the business otherwise lost in the process, and to achieve income and risk diversification.

International conglomeration

The two major reasons are economies of scope and size, in this instance in the form of being attractive to the large international clients. The economic rationale is almost solely related to increased revenue through cross-selling of strong brands. In some cases, where rationalisations have been achieved, they have been related to administrative functions that have been centralised, i.e. information technology, strategic planning, risk management and marketing. Such a conglomerate challenges management capabilities to achieve the efficiency and the improvement anticipated.

The rationale for Bank M&As. Why do they occur? Economic literature versus Views expressed in the industry.

There are divergences between the findings in the economic literature and the views expressed in the industry. In the industry, there are higher expectations of economies of scale than found by various studies. This may be explained by the banking industry being in profound evolution, whereby the industry reacts to changes in the market conditions and not to findings of econometric studies. One of the most important driving forces for changes in market conditions is the development of new technology, which alters the cost structure of production. Furthermore, disintermediation, internationalisation and EMU have changed the market conditions for credit institutions.

The discrepancy between economic literature and the industry might also result from the difficulty of achieving reliable estimates of scale economies, particularly in a forward-looking manner, able to predict the causes for the present industry restructuring*.

The key importance of managerial behaviour for the success of M&As may also explain a good deal of the divergence between the views expressed and the conclusions one would draw from the economic literature. Managers have a positive expectation of their capability to master the human and managerial dimension. The literature does not seem to confirm, however, the validity of these expectations. Furthermore, there might be an element of following the fashion of a global trend towards M&As, and bank managers may have been incited to take part in the M&A wave by investment bankers and other consultants.

The best "fit" between economic literature and reality seems to exist for the small bank mergers that lead to more cost-efficient enterprises and that, for the sector as a whole, will mop up excess capacity. Larger scale operations tend to be less frequent and far more complex. This argument holds even more true for operations leading to large complex financial conglomerates.

Advantages for the institutions and the sector as a whole

There is a positive view of dynamic reactions of the banking industry to changes in regulation and market forces when these are based on well-founded strategies leading to successful M&As.

A reduction in (excess) capacity is a clear advantage in relation to the domestic bank M&A. In addition, domestic bank M&As can constitute a market-based rescue operation for institutions in financial distress. Such rescue operations may reflect existing relations between the two institutions, i.e. two savings banks in neighboring cities, or may be initiated by supervisory authorities. Given that the trust in the financial sector is

* *First, econometric studies need long time series of historical data, but the cost structures of say a decade ago may no longer be very relevant owing to the technological evolutions. Second, accounting-based cost input in the studies may not reveal economic scale benefits, since, for example, small bank might achieve low costs in an accounting sense by outsourcing operations where there are scale economies. Third, the overall economies of scale may not be the full explanation, since benefits from size in certain lines of banking business (such as asset management or wholesale banking) may be a sufficient reason to merge.*

maintained and competition is not distorted, market-based rescue operations have clear advantages compared with those that involve authorities or deposit insurance schemes.

A reduction in capacity may also be achieved in international bank M&As, but the major advantage in this type of operation is the income and risk diversification attained by the institution, which - ceteris paribus - will make the institution less vulnerable to shocks in financial markets and financial distress in a local market.

The major advantage of domestic conglomeration relates to income and risk diversification attained from a broader product range. This is true specifically for bancassurance with an ownership element. The EU regulatory framework allows banks to react dynamically to changes in market developments by entering into new business areas offering growth potential, to add to income and risk diversification. This flexibility - when used with the necessary caution and diligent management - can contribute to stability by risk diversification. This will benefit the different financial sectors included in the conglomerates. Finally, international conglomeration offers advantages in the form of income and risk diversification, not only from a broader product range but also from geographic distribution.

Risks of M&As

Risks associated with the four types of M& As

	Within one country	Intgernational bank M&As
Between credit institutions	**Domestic bank M& As** Ex ante: pricing of the operation and strategic risks. Ex post: operational risks, i.e. integrating risk management, customer and account systems, and internal control procedures. In addition, too high inward orientation with los of clients – resource allocation risk.	**International bank M&As** Ex ante: as for domestic bank M& As, but increases because of cultural differences. Foreign exchange risks. Ex post: as for domestic bank M&As, but increased by different fiscal and accounting treatment and different reporting requirements.
Across different sectors	**Domestic conglomeration** Ex ante: as above but increases because of different business areas. Possible personnel friction because of different staff rules and remuneration schemes. Ex post: as above but increased by different fiscal and accounting treatment and different reporting requirements. Reputation risks in the medium and long term.	**International conglomeration** Ex ante: maximum risk. All risks relating to domestic conglomeration and international bank M& As. Ex post: maximum risk. All risks relating to domestic conglomeration and international bank M&As. Reputation risks in the medium and long term.

The table above flags the most obvious risks in all categories of M&As studied, with more detailed information provided right below.

For **domestic bank M&As** the risks ex ante are mainly associated with the fixing of an appropriate price for the deal. The value should correspond to expected future income. In an M&A involving two institutions operating in the same country with basically the same product line, the strategic issues should be well known to management and the risks therefore manageable.

For the period after the M&A operation (ex post), the major risk is linked to operational issues, i.e. the integration of personnel, information and risk management systems and procedures, the internal control procedures and integration of day-to-day customer and accounting systems. Often, operational problems will differ in mergers and acquisitions; in mergers a full integration of information technology and accounting systems into one platform is needed, whereas functions can be kept separate in acquisitions. In addition to the operational issues, there are likely to be turf battles in the new entity between managers below top-level management, which

might eventually lead to a loss of key personnel. A significant focus on operational issues and turf battles for too long may lead to a loss of clients and markets, owing to the initial inward orientation.

For **international bank M&As** the risks ex ante are very much the same as for domestic bank M&As, but may generally be regarded as higher due to cultural barriers/differences. In the context of strategic risk, management in one country cannot have the same knowledge about the market, regulation and practices in another country. Greater difficulties in fixing the value of the counterpart, in particular, can be expected.

Ex post, the operational risk of international bank M&As is often higher than that of domestic bank M&As. Institutions in two different countries will be subject to different fiscal and accounting treatment and reporting requirements. In addition, the negative impact of a loss of key personnel could be a larger blow because of cultural differences.

The entering of a new business area through **domestic conglomeration** gives rise to the challenge of responding to different corporate cultures. Ex ante the risks will, as for domestic bank M&As, be related to price and strategic risks, but within an "unknown" industry. Apart from explicit corporate differences, and staff associating themselves with a specific type of culture, there are likely to be differences in staff rules and remuneration, which can lead to friction between the two groups of personnel. Ex post, the domestic conglomeration risks will be the challenges of facing different business lines and cultures. Equally great challenges may be encountered in relation to fiscal and accounting treatment and reporting requirements.

A specific element of risk in conglomeration M&As may require particular attention: reputation risk. This is the risk that a failure in one enterprise may lead to a deterioration in the reputation of the whole conglomerate.

With regard to **international conglomeration**, things become more complicated ex ante. Both the business area and the country are different and might not be so well known to the acquirer or merging partners. This brings the strategic and price risks to a maximum. Furthermore, the integration process ex post - and thereby the operational risks - increases because of the two dimensions of the M&A. Maintaining key personnel and management is very important. Again, reputation risks are relevant.

The underlying competitive changes of M&As are also relevant for institutions not involved in the M&As. Banks may respond in different ways to competitive changes and the important issue is whether banks find an adequate response to the pressure for change.

General Idea – Motive of this Study

Numerous studies on M&As[*], have determined that bank mergers and acquisitions generate strong positive valuation effects for targets on average (and possibly bidders engaged in the negotiations), while the evidence of the impact on acquirers is mixed.*

However, the majority of the articles (papers, studies etc) concern the US Banking Industry and not the European (mostly because the US Market compared to the European is deeper, more homogenous and strongly connected, by the same currency).

Realizing the scarcity of research studies on the European Banking M&As:

- **In this study I make a thorough review of all <u>European</u> Banking M&A studies, and report all the general results referring to effects on Bank bidders, acquirers and targets involved in Mergers or Acquisitions.**

- **However, my study will be focused on neither bank acquirers nor bank targets of the M&As, but on all the rival banks of the target (banks headquartered in the same country as the target bank of the M&A announcement).**

- **My objective is to determine whether the information coming from Bank M&A announcements is relevant to the valuation of the banks engaged in the M&A only, or it is transmitted to the other banks (referred to as rival banks) in the industry.**

<u>Analytically, my objectives referring to the econometric analysis are to</u>:

1. Study the intra-industry effects of the announcement of a bank acquisition or merger (to a certain "rival" bank group that activates in the same Market), like Eckbo(1985) and Akhigbe, Madura (1999) did, in the US Banking Industry. However, **I study the European Banking M&As, during the past 6 years (1996-2001),** using only as a guideline the U.S. findings.

2. explain why these intra-industry effects, vary across M&A announcements (cross-sectional analysis).

[*] *Many of these studies are reviewed in the literature part of this thesis.*

⇨ USA Banking Market

The studies cited below are relevant to my study because they confirm that the bank acquisition announcement does contain valuable information, at least for the target bank.

- Research by Cornett and DE (1991), Houston and Ryngaert (1994), and many others have determined that bank acquisition announcements result in significant favorable valuation effects to the target bank.

The results of bank acquisition studies consistently find positive significant valuation effects for target banks (for example, see Cornett and De, 1991), which is consistent with studies of industrial and insurance firms. However, the bank acquisition studies have found mixed results for acquirers.

- Desai and Stover (1985) found positive significant valuation effects for bidder banks engaged in intrastate acquisitions, while Cornett and De (1991) found positive significant valuation effects for bidders engaged in interstate acquisitions.

- Baradwaj et al. (1991) found negative valuation effects for bidding banks engaged in intrastate and interstate acquisitions during the 1981-1987 period.

- Furthermore, Houston and Ryngaert (1994) found that gains to bank targets are offset by a wealth transfer from the bidders, resulting in no significant valuation effect for the consolidated entities at the time of the acquisition announcement. The authors suggest that this result may be due to an increase in target prices before the acquisition announcement, as investors anticipate which banks are likely to be acquired.

Intra-industry effects in response to specific policies enacted by a firm have been detected in other studies.

- For example, Slovin et al. (1991) assessed the intra-industry effects of going-private transactions, and found that these transactions generated positive and significant valuation effects for rivals in the corresponding industry. Szewczyk (1992) assessed the intra-industry effects of stock offerings, and found that these transactions generated small negative (but significant) valuation effects for rivals in the corresponding industry.

- Eckbo (1985) assessed the intra-industry effects in response to horizontal merger announcements. He found that rivals experienced positive significant abnormal returns in response to horizontal merger announcements over the 1963-1981 period. These results suggest that a merger announcement can signal an increased probability that corresponding rivals will be acquired. It may also signal more growth opportunities within the industry. Much of Eckbo's study assessed how the abnormal returns varied with the industry's concentration ratio in order to offer implications for antitrust regulations and the efficient allocation of resources within each industry.

- Baradwaj et al. (1996) measure the share price response of competitor banks to the announcement of 18 defensive acquisitions by banks, which they define as acquisitions that are so large that a future acquisition of the merged bank would be difficult or impossible. They find that smaller competitor banks experience a significant positive response on average to the announcements of 18 defensive acquisitions. This study offers interesting insight in that it documents that news about a bank merger could signal information about competitor banks.

- Last but not least, Aigbe Akhigbe and Jeff Madura made a paper similar to my reasearch but on a USA Bank Acquisition Announcement sample, concerning the period from 1983 to 1996. They concluded that the intra-industry effects of rival bank portfolios are not uniform across announcements, as they are conditioned by variables that could signal information about the probability that rival banks will become takeover targets. The valuation effects of rival bank portfolios are positively related to the valuation effects of the target banks, and inversely related to the size and prior performance of rival bank portfolios. Furthermore, the valuation effects are more favorable for individual rival banks that are ultimately acquired. To the extend that these variables reflect the probability of being acquired in the future, the intra-industry effects appear to be more favorable for acquisitions in which there is a higher probability that the corresponding rivals will become targets. Overall, investors discriminate based on event-specific and rival bank-specific characteristics when interpreting the signal transmitted as a result of bank acquisitions.

⇨ European Banking Market

- Alberto Cybo-Ottone and Maurizio Murgia studied the stock market valuation of mergers and acquisitions in the European banking industry. Based on a sample of very large deals observed from 1988 to 1997, they document that, on average, at the announcement time, the size-adjusted combined performance of both the bidder and the target, is statistically significant and economically relevant. Although their sample shows a great deal of cross-sectional variation, the general results are mainly driven by the significant positive abnormal returns associated with the announcement of domestic bank to bank deals and by product diversification of banks into insurance.

On the contrary, they found that M&A with securities firms and concluded with foreign institutions did not gain a positive market's expectation. Their results are remarkably different from those reported for US bank mergers. They explain the different results as stemming from the different structure and regulation of EU banking markets, which are shown to be more similar between them than as compared with the US one.

- Alireza Tourani Rad and Luuk Van Beek examined cross-border mergers in the European banking sector in terms of their effect on their shareholders' wealth. They found that target bank shareholders experience significant positive abnormal returns while abnormal returns to bidding bank shareholders were not significant. Furthermore, their results suggest that returns to bidding bank shareholders are more positive when the bidder is larger and more efficient. The cross-border mergers did not outperform domestic ones. Finally, there was no significant difference between mergers before the implementation of the EU-Second Banking Directive and those that took place after the implementation.

- Avouris Peter, examined European M&As in terms of their effect on their shareholders' wealth. He also verified, that target bank shareholders experience significant positive abnormal returns, after the M&A announcement. On the contrary, he found that the acquiring party in the M&As, has negative abnormal returns.

- Vander Vennet in two papers (1996,1997) examines the efficiency and profitability of 492 bank mergers and acquisitions between European Institutions from 1988 to 1992, using accounting data. His 1996 study, performing univariate tests, finds some profitability improvements in domestic mergers among equal-sized entities and some efficiency improvements in cross border acquisitions.

- Laura Cavallo and Stefania P.S. Rossi studied the "Scale and scope economies in the European banking systems". They say that the increasing competition induced by the European integration is leading to an intense process of consolidation among European banks, very similar to that, which occurred in the US banking industry in the 1980s. They test if cost improvements in output efficiency are likely to emerge from the ongoing process and to derive some implications for the future market structure. Their results support the view that recent regulatory changes and progresses in technology have contributed to raising the optimal scale. They show that mergers should be oriented to increase bank scale for small banks and to expand into new product lines for large banks.

- Rafael Repullo investigated the determinants of the takeover of a foreign bank by a domestic bank whereby the former becomes a branch of the latter. Each bank is initially supervised by a national agency that cares about closure costs and deposit insurance payouts, and may decide the early closure of the bank on the basis of supervisory information. Under the principle of home country control, the takeover moves responsibility for both the supervision of the foreign bank and the insurance of the foreign deposits to the domestic agency. It is shown that the takeover is more likely to happen if the foreign bank is small (relative to the foreign banking market) and its investments are risky (relative to those of the domestic bank). Moreover, the takeover is in general welfare improving for both countries.

Methodology

The standard event study methodology is used to measure the average daily abnormal returns of rival banks in response to the bank acquisition announcements.

We must point out that we will study the abnormal returns of all the banks that are headquartered in the same country as the target of the M&A announcement (rivals).

Event Study Methodology (General Case)

➢ We know that the observed change in the stock price of a bank, after an M&A announcement in its sector, cannot be attributed exclusively to that announcement, because stock prices during the event period are affected by a multitude of factors other than the announcement of the M&A proposal. If we just want to measure the effect of the announcement on the stock price of a bank, we must first neutralize the movements in prices that result from factors other than the announcement under investigation.

We define R_{jt} as the realized (observed) return of bank stock j at day t and $E(R_{jt})$ as the expected return of bank stock j at day t, that is, the return we anticipated to achieve on that stock if the M&A was not announced. The movement in prices that can be attributed to the announcement is the difference between R_{jt} and $E(R_{jt})$. We can call this difference, the unexpected return (e_{jt}) of stock j at day t :

$$e_{jt} = R_{jt} - E(R_{jt})$$

To calculate e_{jt}, we must estimate $E(R_{jt})$, the unobservable, expected return of stock j during day t. The most popular technique for the $E(R_{jt})$ estimation is the Market Model (Fama et al. (1969) and Fama (1976)).

The Market Model

This model assumes that security returns are distributed according to a multivariate normal distribution. In this case, it can be shown that security returns are generated by the following stochastic process :

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

Where :

- $j = 1,\ldots,n$, (the rival bank for which we will calculate the abnormal return),
- $t = 1,\ldots,w$, (the time period across which we will estimate the abnormal return),
- R_{jt} = rate of return of stock j over day t,
- R_{mt} = rate of return of the Datastream Total Market Index over day t,
- $\beta_j = \text{cov}(R_{jt}, R_{mt})/\text{var}(R_{mt})$,
- $\alpha_j = E(R_{jt}) - \beta_j E(R_{mt})$,

  $\rightarrow$ α_j, β_j : are the estimated parameters of the regression models,
- e_{jt} = the stochastic disturbance term of stock j in day t, which is normally distributed with a zero mean, and serially and contemporaneously uncorrelated with constant variance. $\rightarrow$ $E[e_{jt}] = 0$ and $\text{Var}[e_{jt}] = \sigma^2_{e_j}$.
- $\text{Cov}(e_{jt}, e_{ks}) = 0$, for all $j \neq k$ and $t \neq s$,
- $\text{Cov}(e_{jt}, R_{mt}) = 0$, for all t.

The market portfolio is a portfolio that contains all risky assets in proportion to their market value. However, in practice we use the Datastream Total Market Index as the most representative stock exchange index that is calculated the same way for all the countries participating in our study.

The beta coefficient of stock j is a measure of the sensitivity of that stock to the general market movements. It is defined as the ratio of the covariance of stock j's returns with those of the market, divided by the variance of the market returns.

Running an OLS regression of Rjt on Rmt (with 135 daily rates ending 14 days before the announcement of M&A [-150,-15] and hence outside the event period), we can estimate the parameters $\hat{\alpha}_j$ and $\hat{\beta}_j$ for each stock. Using these estimated parameters we can rewrite the market model equation as follows:

$$\hat{e}_{jt} = R_{jt} - [\hat{\alpha}_j + \hat{\beta}_j R_{mt}]$$

So, deducting expected returns from observed returns, yields an estimate of unexpected returns $\hat{e}_{jt}$ which are also referred to as "abnormal" returns. In other words,

$[\hat{\alpha}_j + \hat{\beta}_j R_{mt}]$ is the "normal" return of stock j at day t , and the abnormal return of stock j at day t is simply equal to $\hat{e}_{jt}$.

Note that the market model breaks down the total return on stock j into two components : a market component and a firm-specific component. So, deducting $[\hat{\alpha}_j + \hat{\beta}_j R_{mt}]$ from R_{jt} neutralizes the effect of the general market movements but does not neutralize firm-specific price variations caused by events *other than the announcement of the merger proposal.*

To neutralize firm-specific price variations caused by events other than the particular announcement being investigated, we can take the cross-sectional average of the unexpected returns (Abnormal Returns) for the stocks in our sample for each of day of the 4 weeks that make up the event period. We have:

$$AR_t = e_t = \frac{1}{n}\sum_{j=1}^{n} e_{jt}$$

Where : t = -14,-13,.....13,14, n = the number of events investigated and AR_t is the sample average abnormal return (same as the sample average unexpected return) during day t.

The cross sectional average neutralizes firm-specific price variations unrelated to the event of interest because that event didn't occur at the same point in time for all n stocks.

The methodology described above will be applied in our case, but with the difference that the cross sectional average will not be calculated for bank stocks but but for rival bank portfolios.

The last step in the analysis of abnormal returns is to calculate cumulative average abnormal returns (CAR's) for days within the event period. The day the announcement is made is day 0, the pre-announcement and post-announcement periods covers 2 weeks before and after the announcement. The cumulative average abnormal returns for the n stocks in the sample from day –14 up to day 14 is computed as :

$$\text{CAR}[-14,14] = \sum_{t=-14}^{14} AR_t$$

Application of Event Study Method for Portfolios (Our Case)

For every Bank M&A Announcement we construct the appropriate Rival Bank Portfolio that, contains all the rival banks that were headquartered in the same country as the target, and were publicly traded at the time of the acquisition. All the rival banks are pooled into an equally weighted portfolio, because we treat them as equals in regards to their response to the event.

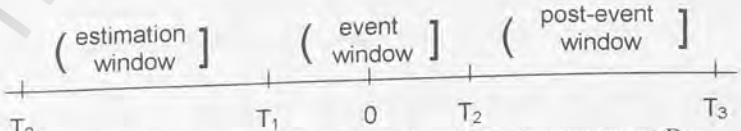
If we had used Market Value weighted Portfolios, we would have created a bias to our theory, as we would be assuming that bigger Bank's abnormal returns are of greater significance to our portfolio. But, contrarily, we take all the rival banks of equal significance to our portfolio because we will later on try to interpret the abnormal returns variability through specific rival bank characteristics. After all, we are not examining the reaction of the Bank Market as a whole (where we should weight the reactions of the constituents), but the reaction of a portfolio that contains all the available rival banks. If we used weights in this portfolio, we would be considering the reactions of some constituents more important than the others, and it is clear that this is not the case.

As we have analytically seen in the previous section we calculate the abnormal return for rival bank j and for each date t in the event window, by the Market Model as:

$$AR_{jt} = R_{jt} - [\hat{\alpha}_j + \hat{\beta}_j R_{mt}]$$

where **ARjt** is the abnormal return, **Rjt** is the daily return, **Rmt** is the daily return on Datastream Total Market Index, and the parameters $\hat{\alpha}_j$ and $\hat{\beta}_j$ are obtained from the market model, estimated with daily returns from the "estimation period before the announcement date".

In the figure below we make a complete analysis of the time periods used in our study.



With : $T_0 = -150$, $T_1 = -15$, $T_2 = 14$ and "0" the Announcement Day.

estimation window = $(T_0,T_1] = [T_0+1,T_1] = [-149,-15]$, Width $L_1 = T_1 - T_0 = 135$

event window = $(T_1,T_2] = [T_1+1,T_2] = [-14,14]$, Width $L_2 = T_2 - T_1 = 14-(-15) = 29$

✓ As we know from Portfolio theory, the return of an equally weighted portfolio is calculated as the Mean (average) of the returns of its constituents (If we used different weights for every constituent of the portfolio it is more than obvious that we should weight the constituent's returns, in order to find the return of the Portfolio).

Respectively, we will use the portfolio theory in order to calculate the abnormal return of each rival bank portfolio p, for each date t in the event period. So the abnormal return of the equally weighted portfolio will be calculated as an average of the abnormal returns of its constituents. Analytically, we have :

$$AR_{pt} = \frac{\sum_{j=1}^{n} AR_{jt}}{n}$$

where

- ARpt is the daily abnormal return of the rival bank portfolio and
- ARjt is the daily abnormal return of the rival bank j
- n is the number of rival banks that constitute the p portfolio
- t is the day in the estimation window, $t \in (-15,15)$

Testing for Statistical significance of Abnormal Returns

Estimated Mean returns may be different from zero although true, unobservable, mean returns are in fact zero. Estimated mean returns must be subjected to a statistical test to find out whether they are significantly different from zero (or even positive or negative) for a given level of significance.

✓ I intend to follow the methodology of Mikkelson and Partch (1988) as it is applied in the Akhigbe and Madura (1999) paper. The z-statistic will be computed and used to test for *statistical significance of standardized abnormal returns*.

Before creating the statistic used for the significance tests we have to calculate the Cumulative abnormal returns of the portfolios of rival banks, for a specific time window.

$$\hat{CAR}_t = \sum_{i=1}^{m} \hat{ARp}_{it}$$

→ for m number of events

→ and t the time window in which we estimate the CAR.

We will use a statistic adjusted for the cross sectional variation of abnormal returns across our sample of events. That way we will eliminate all the effects of the rival bank portfolios that were irrelevant to the announcements of the M&As. (These effects are not market related because all market related effects are eliminated by the market model theory applied. They are rival bank portfolio effects irrelevant to the M&A announcements studied).

So, we estimate the following statistic, that follows the standard normal distribution N ~ (0,1) :

$$Z = \frac{\hat{CAR}_t}{\sqrt{m} \cdot \hat{\sigma}_t}$$

→ t is the occasional time window in which we calculate the CARs,

→ σ_t is the cross sectional standard deviation of m events in the sample, across the t time window

→ m is the number of events

In the table below, we present the way we will test the statistical significance of the Z Statistic. There are three hypothesis tested : those of zero, positive and negative CARs

Testing the Null Hypothesis H_0, against the Alternative H_1		
H_0: $\hat{CAR} = 0$ **H_1:** $\hat{CAR} \neq 0$ $\lvert Z \rvert > 1{,}96 \Rightarrow$ **Reject H_0**	**H_0:** $\hat{CAR} > 0$ **H_1:** $\hat{CAR} \leq 0$ $Z < -1{,}65 \Rightarrow$ **Reject H_0**	**H_0:** $\hat{CAR} < 0$ **H_1:** $\hat{CAR} \geq 0$ $Z > 1{,}65 \Rightarrow$ **Reject H_0**

(significance Level 5%)

(we ought to point out that the critical value of the last two tests (for positive and negative estimated CARs), has a slight declination from the 1,65 value) "See Statistical Tables"

Notes on our Methodology

✓ **Note that all our calculations will be done using logarithmic daily returns :**

$R_{i,t} = \ln(P_{i,t}) - \ln(P_{i,t-1}) = \ln\left(\frac{P_{i,t}}{P_{i,t-1}}\right)$ for the daily return of stock i at time t ,

$R_{m,t} = \ln(P_{m,t}) - \ln(P_{m,t-1}) = \ln\left(\frac{P_{m,t}}{P_{m,t-1}}\right)$ for the market price index return at time t.

and so on …

The logarithmic way of estimating daily price returns was preferred to the classic analog one because logarithms have the eligible adding property of :

$$\sum_{t=1}^{n} R_t = \sum_{t=1}^{n} \ln(\frac{P_t}{P_{t-1}}) = \sum_{t=1}^{n} [\ln(P_t) - \ln(P_{t-1})] = \ln(P_n) - \ln(P_0) = \ln(\frac{P_n}{P_0})$$

that makes our estimations concerning aggregations much more accurate.

✓ **Also, note that in all our calculations we use as a Market Index the Datastream Total Market Index.** We do so because we want a uniform calculation of the market index across the European Countries Studied.

Sample and Data Selection

I will examine a list of European bank merger and acquisition announcements (over the period from 1996 to 2001), in order to measure the abnormal returns of rival bank portfolios, in response to the information transmitted from bank M&A announcements to the Banking sector.

Bank mergers and acquisitions are included in the final sample if they meet the following criteria:

(1) The bank acquisition was reported in European Economic Press,
(2) the bank merger or acquisition announcement was free of any confounding events that could distort the measurement of the target bank's valuation effects and the intra-industry effects over the announcement period,
(3) the target bank had stock price data available on the Datastream, for the estimation window(135 days) and the event window (29days),
(4) the target bank had at least one listed rival bank headquartered in the same country and
(5) the rival banks identified, had stock price data available on the Datastream, for the estimation window(135 days) and the event window (29days),
(6) the volume of the M&A transaction was at least €100 million (valued at the time of the merger or acquisition announcement.).

- **I used a specific database of M&A Announcement dates, used by Peter Avouris in his study of M&As and its effects on shareholders wealth. A total of about 218 bank M&As was assessed, for a time period of six years (1996-2001).**

- This sample was initially screened, to exclude all the events that concern bank targets of countries outside the EU 15 Block (plus Switzerland and Norway). Furthermore, very small bank acquisition announcements that haven't received as much attention, have been excluded from our sample. So, after filtering our initial database, we came up to a total of 218 M&A European Bank announcements.

The exact composition of the rival bank sample varies across events because the number of banks that qualify for inclusion in each case's rival bank sample varies over time. The mean number of rival banks per event (for the 6 years studied) is 17. So, on

average we calculated the abnormal returns of 218*17 = 3706 rival banks for the 218 events of Bank M&A Announcements studied.

Our Sample of Bank M&A Announcements

The total number of M&As shows a clearly higher number of transactions in 1998 and 1999 compared with the previous two years. Analytically, we have a sample of 218 Bank M&A cases, of which 113 (51,8 %) are announced in years 1998,1999. As for year 2000, we observe a downward movement of 20 %. This movement, together with the upward movements 1997-1998 of 73 % and 1996-1997 of 65 %, creates the solid impression of the 1998 and 1999 pick years. However, we shouldn't rush into conclusions before analysing all 2001 data that are not yet available.

Moreover 63,3 % of total M&As have involved credit institutions from DE, IT, FR,SP and UK, showing a clear concentration of M&As in the countries with the highest number of banks.

		YEARS							
		1996	1997	1998	1999	2000	2001		
COUNTRIES	AUSTRIA	1	3	2	-	2	-	8	SUMs Of M&As Per COUNTRY
	BELGIUM	-	2	6	-	-	1	9	
	DENMARK	-	-	1	1	2	1	5	
	FINLAND	-	-	-	3	-	-	3	
	FRANCE	5	4	7	10	7	2	35	
	GERMANY	1	1	6	4	2	1	15	
	GREECE	-	-	5	3	2	-	10	
	IRELAND	-	1	-	1	2	-	4	
	ITALY	4	8	14	13	14	1	54	
	LUXEMBOURG	-	-	-	2	1	1	4	
	NETHERLANDS	1	1	1	-	1	-	4	
	NORWAY	1	1	2	6	-	-	10	
	PORTUGAL	2	1	2	1	4	-	10	
	SPAIN	1	3	5	6	5	-	20	
	SWEDEN	1	5	-	-	-	-	6	
	SWITZERLAND	1	1	2	3	-	-	7	
	UK	2	2	4	3	3	-	14	
		20	33	57	56	45	7	218	
		SUMs Of M&As Per YEAR							

We will now compare our own data set of European Bank M&As with that of ECB's, as it is cited in the Paper "Mergers and acquisitions involving the EU banking industry" .

According to the ECB, a clearly higher number of transactions, was observed in 1998 and 1999 compared with the previous three years. This is mainly due to the number of domestic M&As.. It is remarkable that around 80% of total M&As have involved credit institutions from DE, IT, FR and AT. These four countries also have the highest number of credit institutions among Member States.

Table 1

Number of total bank M&As

(domestic and cross-border)

	1995	1996	1997	1998	1999	First half 2000
Total bank M&As	326	343	319	434	497	234
– of which domestic	275	293	270	383	414	172
– of which within EEA	20	7	12	18	27	23
– of which with third country	31	43	37	33	56	39

ECB Mergers and acquisitions involving the EU banking industry • December 2000

After comparing the two tables above, it becomes clear that both studies are based on similar data, in terms of their country allocation of M&A events. That conclusion is very important for our study, because it shows that our dataset is indicative of the European M&A activity, as reported by ECB.

In the tables below we see the breakdown of our sample of M&A Announcements across the 17 countries that take part in our research. On the left we analyze the complete sample, while on the right we analyze only the sample of the traded targets.

We must point out that not all the events of our initial sample concerned targets traded in the Stock Exchange (of their country). So, after the filtering of the non-traded ones, we ended up with a sample of 95 events of M&A Announcements for traded targets.

M&As per Country

COUNTRY	NO
AUSTRIA	8
BELGIUM	9
DENMARK	5
FINLAND	3
FRANCE	35
GERMANY	15
GREECE	10
IRELAND	4
ITALY	54
LUXEMBOURG	4
NETHERLANDS	4
NORWAY	10
PORTUGAL	10
SPAIN	20
SWEDEN	6
SWITZERLAND	7
UK	14
SUM	218

M&As per Country for Traded Targets

COUNTRY	NO
AUSTRIA	2
BELGIUM	4
DENMARK	3
FINLAND	2
FRANCE	21
GERMANY	4
GREECE	6
IRELAND	1
ITALY	17
LUXEMBOURG	2
NETHERLANDS	1
NORWAY	6
PORTUGAL	7
SPAIN	9
SWEDEN	3
SWITZERLAND	2
UK	5
SUM	95

In the tables below we split our sample in two categories. One category contains domestic M&A announcements, (between Banks of the same country) and the other contains international M&A announcements (between Banks of different countries).

Target-Acquirer Country	No	Percentage
"The same"	144	66.1%
"Different"	74	33.9%
	218	

Target-Acquirer Country	No	Percentage
"The same"	67	70.5%
"Different"	28	29.5%
	95	

In the tables below we split our sample in four categories in terms of the percentage of the target bank acquired by the specific deal (left) and in terms of the percentage of the target bank that is held by acquirer after the adding of the percentage acquired in this deal (right). We also split our sample in categories of percent of the target held in each case.

% of target acquired	No	Percentage
X<25	58	26.6%
25≤X<50	40	18.3%
50≤X<100	53	24.3%
X=100	67	30.7%
SUMS	218	100%

total % of target	No	Percentage
X<25	51	23.4%
25≤X<50	21	9.6%
50≤X<100	61	28.0%
X=100	85	39.0%
SUMS	218	100%

Finally, we must point out that all the events that constitute our sample are M&As that were finally completed, so they are comparable.

In the Table Below we present the Herfindahl indices for 15 countries of our study. Unfortunately, we couldn't find the Herfindahl for all 17 countries of our research. All the ECB Information Sources didn't contain info for countries outside the EE, such as Norway and Switzerland, that take part in our research, instead of their not participation in EE.

Herfindahl Index	1995	1996	1997	1998	1999	2000
AT	0.0437	0.0445	0.0831	0.0983	0.1016	0.1107
BE	0.0637	0.0670	0.0700	0.1310	0.1552	0.1882
DE	0.0093	0.0100	0.0112	0.0134	0.0136	0.0144
DK	0.1211	0.1186	0.1164	0.1337	0.1363	0.0141
ES	0.0528	0.0503	0.0496	0.0488	0.0716	0.0899
FI	0.1786	0.1793	0.1814	0.2041	0.1910	0.1842
FR	0.0421	0.0437	0.0449	0.0485	0.0509	0.0567
GR	0.1778	0.1664	0.1534	0.1539	0.1513	0.1550
IE	0.0650	0.0580	0.0500	0.047	0.0480	0.0490
IT	0.0340	0.0313	0.0308	0.0409	0.0600	0.0688
LU	0.0178	0.0193	0.0202	0.0224	0.0237	0.0255
NL	0.1603	0.1536	0.1654	0.1802	0.1700	0.1757
PT	0.1397	0.1491	0.1299	0.1307	0.1234	0.1846
SE	0.1950	0.2000	0.2040	0.2010	0.1951	0.1940
UK	0.0191	0.0206	0.0207	0.0216	0.0263	0.0275
Average	0.0880	0.0874	0.0887	0.0984	0.1012	0.1025

Source: Sandrine Corvoisier, Reint Gropp (2001). "Bank Concentration and Retail Interest Rates" ECB, Working Paper Series.

An increase in concentration, particularly for large countries, is observed. The increase is linked to the M&As that have been observed in these countries. A certain relationship seems to exist between the size of the country, concentration and M&A activity. The relationship is that smaller countries tend to have high concentration ratios and M&A activity tends to be lower in highly concentrated markets.

Intra-Industry Effects

We know that each bank acquisition announcement could positively or negatively affect its rivals.

According to Eckbo (1983), a more favorable impact on the target may reflect the potential to realize efficiency gains, which may signal similar opportunities for other rivals as well. In order to benefit from these opportunities, the rival banks may become possible targets. The market value of the rival banks will be bid up in anticipation of the expected gains from such acquisitions, so that bank rival values are positively related to the impact on the target.

Alternatively, a more favorable impact on the target may imply an increase in efficiency from its combination with the acquiring bank, which may place the rival banks at a disadvantage and therefore causes the market value of rival banks to decline.

The intra-industry effects found in our study are disclosed in the table below. When considering all bank acquisition announcements, the mean abnormal return of rival banks in response to bank acquisition announcements is 0.47% for the [-1,0] time period. These results support the hypothesis that bank acquisition announcements not only affect the values of the target banks, but also affect all the other rival banks headquartered in the same country.

✓ A. Akhigbe and J. Madura in their similar study in USA, calculated a mean abnormal return of rival banks in response to bank acquisition announcements of 0.86% for the [-1,0] time period.

In all the tables below we present numerous calculations of the rival banks CAR, across several time windows. More specifically, we calculate the Car at the day 0 of the announcement, at the complete 29 day event window [-14,+14], at the two day windows that include the day before [-1,0] and after [0,+1] the day "0" of the announcement.

We must point out that the event window [-1,0] is the most significant according to the Event Study Bibliography, because it focuses exactly on the leakage of the M&A news to the Market. So, we will later on conduct a cross sectional analysis of the CAR[-1,0] in accordance to the Akhigbe, Madura Study.

Several, more Rival Bank Car are calculated across different event windows, in order to offer further insight to the Abnormal return of the Portfolio and its characteristics. So, we calculate the CAR for windows up to 5 days before and after the day "0" of the event. Finally, in an attempt to understand the previous and subsequent to the event, performance of the rival Bank portfolio, we calculate the CAR for the windows [-14,-3] and [3,14].

So, we calculate for all the time period windows around, before and after the announcement of the MorA, the Abnormal Returns of the Portfolios of Rivals of the Target's, Banks. For all the aforementioned time periods, we also present the Mean Abnormal Return, the Cumulative Abnormal Return, its Standard Deviation and last but not least its Z-Statistic Value, which is tested under tree H_0 hypothesis :

$Z = \dfrac{\hat{CAR}_t}{\sqrt{m} \cdot \hat{\sigma}_t}$	1. $CAR = 0$
	2. $CAR > 0$
Z-Statistic is tested under three H_0 Hypothesis :	3. $CAR < 0$

Z statistic follows the standard normal distribution $N \sim (0,1)$ for large m.

→ t is the occasional time window in which we calculate the CARs,

→ σ_t is the cross sectional standard deviation of m events in the sample, across the t time window

→ m is the number of events

In the table below, we present the way we will test the statistical significance of the Z Statistic for the three hypothesis tested.

Testing the Null Hypothesis H_0, against the Alternative H_1		
H_0: $CAR = 0$ **H_1:** $CAR \neq 0$ $\lvert Z \rvert > 1{,}96 \Rightarrow$ **Reject H_0**	**H_0:** $CAR > 0$ **H_1:** $CAR \leq 0$ $Z < -1{,}65 \Rightarrow$ **Reject H_0**	**H_0:** $CAR < 0$ **H_1:** $CAR \geq 0$ $Z > 1{,}65 \Rightarrow$ **Reject H_0**

(significance Level 5%)

(we ought to point out that the critical value of the last two tests (for positive and negative CAR), has a slight declination from the 1,65 value) "See Statistical Tables"

✓ In the tables presented in the following pages, we make several filterings to our data and observe their consequences to the sample's Mean Abnormal Returns and its significance across its time window.

✓ First, we study all our sample of M&A announcements. Then we make several classifications of the sample according to the deal value of the events, the status of the target (traded or not) ,the percent of the target acquired and the domestic and international events.

ALL THE EVENTS

#218	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.004073382**	**0.001826706**	**0.00473161**	**0.005203872**	**0.0058621**	**0.006477507**	**0.004760386**	**0.005633524**	**0.005084214**	**-0.00497755**	**0.000326744**
CAR	0.887997198	0.39822195	1.031490908	1.134444192	1.277937901	1.412096617	1.037764194	1.228108281	1.108358672	-1.08510485	0.071230186
σ(e)	0.017832802	0.070006113	0.021939129	0.026001433	0.029795082	0.037992616	0.039423128	0.040084747	0.044309219	0.040096834	0.034969999
Z-STAT	**3.372591695**	**0.385266268**	**3.184327803**	**2.955000798**	**2.904938326**	**2.517311518**	**1.782868683**	**2.075053336**	**1.694173861**	**-1.83287725**	**0.137955877**
sig. level(0)	0.00074475	0.700040252	0.001451036	0.00312682	0.003673389	0.011825458	0.074607581	0.037981461	0.090232191	0.06682071	0.89027523
sig. level(+)	0.999627625	0.649979874	0.999274482	0.99843659	0.998163306	0.994087271	0.962696209	0.98100927	0.954883904	0.033410355	0.554862385
sig. level(-)	0.000372375	0.350020126	0.000725518	0.00156341	0.001836694	0.005912729	0.037303791	0.01899073	0.045116096	0.966589645	0.445137615

For all the time windows mentioned in the first row of the table, we present the Mean Abnormal Return, the Cumulative Abnormal Return, its Standard Deviation and the Z-Statistic Value. In the three rows following the statistic we test the hypothesis of average abnormal returns being : a)equal to zero, b) positive and c) negative.

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].

TOP 150 DEAL VALUE EVENTS

#150	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.005366564**	**0.005670534**	**0.006496729**	**0.007527994**	**0.00865816**	**0.008944835**	**0.008074067**	**0.007926641**	**0.006969852**	**-0.00387538**	**0.000601081**
CAR	0.804984565	0.850580104	0.974509381	1.129199121	1.298723937	1.341725322	1.21111012	1.18899622	1.045477741	-0.58130743	0.090162209
σ(e)	0.020094978	0.071871145	0.024158727	0.02922112	0.033030086	0.042237835	0.042195982	0.043331453	0.046969083	0.041547659	0.035092773
Z-STAT	**3.270802933**	**0.966306777**	**3.29356579**	**3.155208367**	**3.210417477**	**2.593679666**	**2.343510518**	**2.240431089**	**1.81742744**	**-1.14238813**	**0.20977862**
sig. level(0)	0.001072547	0.333890681	0.000989369	0.001603968	0.00132555	0.009495556	0.019103184	0.025062868	0.069151576	0.253292827	0.833840519
sig. level(+)	0.999463727	0.833054659	0.999505315	0.999198016	0.999337225	0.995252222	0.990448408	0.987468566	0.965424212	0.126646414	0.58307974
sig. level(-)	0.000536273	0.166945341	0.000494685	0.000801984	0.000662775	0.004747778	0.009551592	0.012531434	0.034575788	0.873353586	0.41692026

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].

TOP 100 DEAL VALUE EVENTS

#100	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.007198563**	**0.017359728**	**0.008665346**	**0.010117795**	**0.011584578**	**0.013548129**	**0.013767108**	**0.014081573**	**0.013732815**	**0.000314273**	**0.003497325**
CAR	0.719856275	1.735972807	0.866534594	1.011779487	1.158457807	1.354812932	1.37671083	1.408157261	1.373281524	0.031427347	0.349732527
σ(e)	0.023236096	0.074112414	0.027231621	0.034018485	0.038026644	0.048044329	0.047286623	0.047314521	0.050880282	0.041640755	0.032949598
Z-STAT	**3.098008648**	**2.342350914**	**3.182089684**	**2.974205026**	**3.046437114**	**2.819922659**	**2.911417114**	**2.976163009**	**2.699044647**	**0.075472568**	**1.061416688**
sig. level(0)	0.001948394	0.019162649	0.001462295	0.002937625	0.002315847	0.004803646	0.003598068	0.002918935	0.006953983	0.939838585	0.288500633
sig. level(+)	0.999025803	0.990418676	0.999268852	0.998531187	0.998842076	0.997598177	0.998200966	0.998540533	0.996523009	0.530080707	0.855749684
sig. level(-)	0.000974197	0.009581324	0.000731148	0.001468813	0.001157924	0.002401823	0.001799034	0.001459467	0.003476991	0.469919293	0.144250316

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].

TOP 50 DEAL VALUE EVENTS

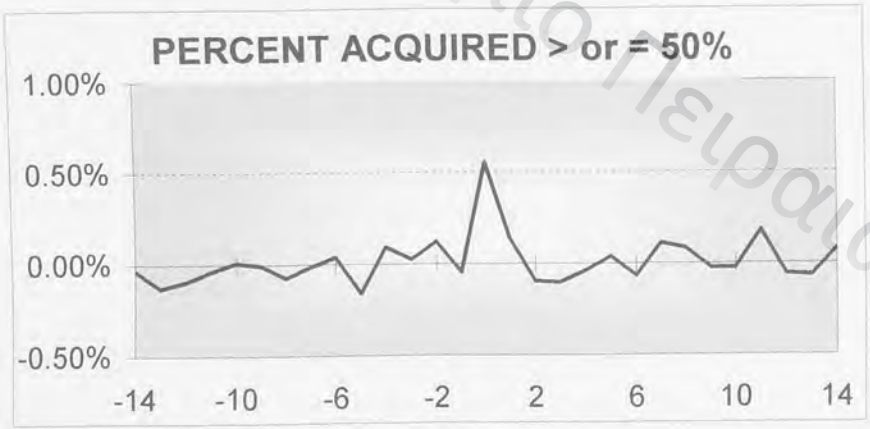
#50	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.009494663**	**0.011773421**	**0.009893623**	**0.013630037**	**0.014028997**	**0.018415293**	**0.018581191**	**0.016593462**	**0.017118481**	**-0.00121689**	**-0.00542498**
CAR	0.474733133	0.588671026	0.494681147	0.681501858	0.701449873	0.92076465	0.929059562	0.829673092	0.855924068	-0.06084444	-0.27124919
σ(e)	0.029501625	0.074106724	0.033394604	0.040547338	0.044848307	0.056249687	0.055213958	0.053397393	0.056752228	0.037321841	0.030495062
Z-STAT	**2.275718836**	**1.123388682**	**2.094903692**	**2.376948068**	**2.21190051**	**2.314960159**	**2.379631331**	**2.197363721**	**2.132884405**	**-0.23055408**	**-1.25792259**
sig. level(0)	0.022862775	0.261272549	0.036179427	0.017456521	0.026973447	0.020615061	0.017329943	0.027994382	0.032934092	0.817661328	0.208419883
sig. level(+)	0.988568612	0.869363726	0.981910286	0.991271739	0.986513276	0.989692469	0.991335028	0.986002809	0.983532954	0.408830664	0.104209941
sig. level(-)	0.011431388	0.130636274	0.018089714	0.008728261	0.013486724	0.010307531	0.008664972	0.013997191	0.016467046	0.591169336	0.895790059

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].

EVENTS WHERE AT LEAST 50% OF THE TARGET IS ACQUIRED

#117	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.005518678**	**0.00409667**	**0.005057374**	**0.006878058**	**0.006416754**	**0.006679298**	**0.005933554**	**0.006468032**	**0.005267905**	**-0.00376649**	**0.00118386**
CAR	0.645685312	0.479310356	0.591712741	0.804732739	0.750760168	0.781477887	0.694225814	0.756759711	0.616344836	-0.44067911	0.138511576
σ(e)	0.021652634	0.069992229	0.025311603	0.03082651	0.034350223	0.045818082	0.046967695	0.047148244	0.051163392	0.035483023	0.035685963
Z-STAT	**2.756876044**	**0.633102543**	**2.161216847**	**2.413428164**	**2.020592458**	**1.576837186**	**1.366496692**	**1.48388264**	**1.11370842**	**-1.1481772**	**0.358835761**
sig. level(0)	0.005835759	0.526666555	0.030678483	0.015803235	0.043321832	0.114833002	0.171783234	0.137840122	0.265404385	0.250895524	0.719718077
sig. level(+)	0.99708212	0.736666722	0.984660759	0.992098383	0.978339084	0.942583499	0.914108383	0.931079939	0.867297808	0.125447762	0.640140962
sig. level(-)	0.00291788	0.263333278	0.015339241	0.007901617	0.021660916	0.057416501	0.085891617	0.068920061	0.132702192	0.874552238	0.359859038

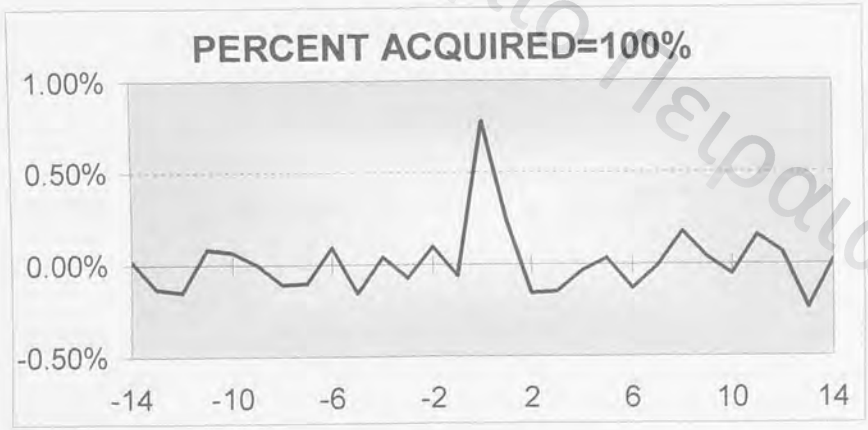
In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].



EVENTS WHERE 100% OF THE TARGET IS ACQUIRED

#66	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	0.007792519	0.003591983	0.007189584	0.010208148	0.009605213	0.008983429	0.006769799	0.006832101	0.005600559	-0.00412633	-0.00126511
CAR	0.514306278	0.237070853	0.474512548	0.673737789	0.633944059	0.592906311	0.446806767	0.450918634	0.369636923	-0.2723379	-0.08349756
σ(e)	0.025809406	0.073709682	0.02945368	0.034989986	0.03895725	0.053251401	0.054889545	0.054702543	0.057932919	0.036056683	0.037540497
Z-STAT	2.45285484	0.395896494	1.983061469	2.370146399	2.003044873	1.370512709	1.001977901	1.014655704	0.78537661	-0.92971607	-0.27378005
sig. level(0)	0.014172761	0.692181481	0.047360424	0.017781016	0.045172333	0.170527026	0.31635428	0.310269999	0.432232655	0.352518067	0.784253775
sig. level(+)	0.99291362	0.653909259	0.976319788	0.991109492	0.977413834	0.914736487	0.84182286	0.844865	0.783883673	0.176259034	0.392126888
sig. level(-)	0.00708638	0.346090741	0.023680212	0.008890508	0.022586166	0.085263513	0.15817714	0.155135	0.216116327	0.823740966	0.607873112

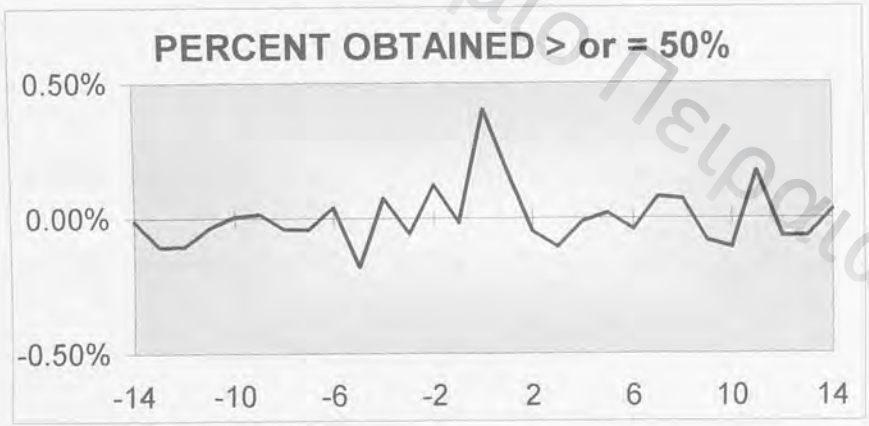
In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].



EVENTS WHERE AT LEAST 50% OF THE TARGET IS CUMULATIVELY OBTAINED AFTER THE DEAL

#146	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	0.004004189	0.000627674	0.003820479	0.005713304	0.005529594	0.006249377	0.004602528	0.005232969	0.003596614	-0.00442609	-0.00119561
CAR	0.584611589	0.091640339	0.557789989	0.834142368	0.807320768	0.912409029	0.671969049	0.764013456	0.525105647	-0.64620928	-0.17455941
σ(e)	0.020348249	0.074607044	0.02403923	0.029701547	0.033443584	0.04347538	0.044998825	0.045010708	0.048922827	0.037502152	0.0375984
Z-STAT	2.377737712	0.101655394	1.920320565	2.324259869	1.997822433	1.736879797	1.235866809	1.404781353	0.888298067	-1.42606911	-0.38423548
sig. level(0)	0.017419187	0.919030095	0.054817284	0.020111523	0.045735774	0.08240831	0.216508206	0.160086408	0.374380363	0.153848486	0.700804025
sig. level(+)	0.991290406	0.540484953	0.972591358	0.989944239	0.977132113	0.958795845	0.891745897	0.919956796	0.812809818	0.076924243	0.350402013
sig. level(-)	0.008709594	0.459515047	0.027408642	0.010055761	0.022867887	0.041204155	0.108254103	0.080043204	0.187190182	0.923075757	0.649597987

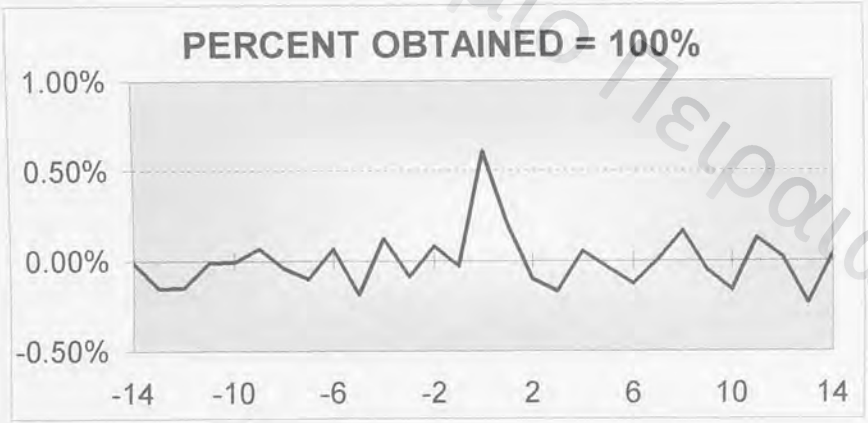
In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].



EVENTS WHERE 100% OF THE TARGET IS CUMULATIVELY OBTAINED AFTER THE DEAL

#85	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.006096676**	**-0.00101776**	**0.005803445**	**0.008068675**	**0.007775443**	**0.007538436**	**0.004966737**	**0.00676224**	**0.004526122**	**-0.00497805**	**-0.00357814**
CAR	0.518217488	-0.08650954	0.493292835	0.685837344	0.660912691	0.640767087	0.422172631	0.574790428	0.384720347	-0.42313466	-0.30414197
σ(e)	0.024153117	0.076837293	0.027973365	0.034192966	0.038368828	0.051778001	0.05362334	0.052921709	0.055126762	0.036232638	0.040084832
Z-STAT	**2.327176972**	**-0.12211879**	**1.912716619**	**2.175579148**	**1.868340792**	**1.342287216**	**0.853938812**	**1.178056731**	**0.756960491**	**-1.26668662**	**-0.82297536**
sig. level(0)	0.019955802	0.902804855	0.055784205	0.029586638	0.061714457	0.179503009	0.393138794	0.238774107	0.449073389	0.205267497	0.410521889
sig. level(+)	0.990022099	0.451402427	0.972107898	0.985206681	0.969142772	0.910248495	0.803430603	0.880612947	0.775463305	0.102633749	0.205260945
sig. level(-)	0.009977901	0.548597573	0.027892102	0.014793319	0.030857228	0.089751505	0.196569397	0.119387053	0.224536695	0.897366251	0.794739055

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].



ALL THE EVENTS WITH TRADED TARGETS

#95	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-2]	[2,14]
MEAN	**0.00808148**	**0.002536928**	**0.01000748**	**0.01257729**	**0.01450329**	**0.01726691**	**0.01421033**	**0.01317092**	**0.01108481**	**-0.01144748**	**-0.00328249**
CAR	0.76774013	0.241008164	0.95071034	1.19484242	1.37781263	1.64035611	1.34998167	1.25123782	1.05305702	-1.08751101	-0.31183693
σ(e)	0.02453382	0.080832393	0.02873848	0.03514868	0.03962733	0.04978379	0.04977123	0.04987124	0.05305246	0.04371015	0.03168903
Z-STAT	**3.21060766**	**0.305903549**	**3.39408464**	**3.48770577**	**3.5672499**	**3.38055775**	**2.78283666**	**2.57411468**	**2.03650054**	**-2.55263977**	**-1.00961737**
sig. level(0)	0.00132467	0.759678214	0.00068869	0.00048727	0.00036083	0.00072349	0.00538871	0.01004975	0.04169998	0.01069105	0.31267866
sig. level(+)	0.99933766	0.620160893	0.99965566	0.99975636	0.99981959	0.99963825	0.99730564	0.99497512	0.97915001	0.00534553	0.15633933
sig. level(-)	0.00066234	0.379839107	0.00034434	0.00024364	0.00018041	0.00036175	0.00269436	0.00502488	0.02084999	0.99465447	0.84366067

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].

TOP 50 DEAL VALUE EVENTS WITH TRADED TARGETS

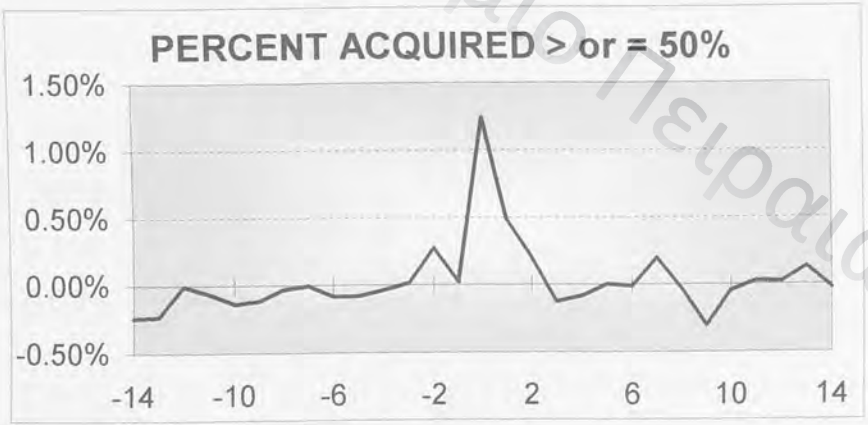
#50	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-1]	[2,14]
MEAN	**0.01419356**	**0.025493143**	**0.01708037**	**0.0213016**	**0.02418841**	**0.02981975**	**0.02886344**	**0.02721711**	**0.02595234**	**-0.00331743**	**-0.00100917**
CAR	0.70967776	1.274657163	0.85401832	1.06507983	1.20942039	1.49098752	1.44317211	1.36085573	1.29761701	-0.16587164	-0.05045872
σ(e)	0.03029788	0.080396464	0.0342757	0.04320789	0.04753116	0.05895556	0.05705935	0.05833604	0.06099715	0.03923045	0.03322458
Z-STAT	**3.31256168**	**2.242184987**	**3.52367479**	**3.48605362**	**3.59843641**	**3.57654954**	**3.57689591**	**3.29905923**	**3.0085134**	**-0.59794857**	**-0.21477898**
sig. level(0)	0.00092457	0.024949337	0.00042569	0.00049029	0.00032021	0.00034824	0.00034778	0.00097021	0.00262543	0.54987414	0.82993971
sig. level(+)	0.99953771	0.987525331	0.99978715	0.99975485	0.99983989	0.99982588	0.99982611	0.99951489	0.99868728	0.27493707	0.41496986
sig. level(-)	0.00046229	0.012474669	0.00021285	0.00024515	0.00016011	0.00017412	0.00017389	0.00048511	0.00131272	0.72506293	0.58503014

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].

EVENTS WHERE AT LEAST 50% OF THE TARGET IS ACQUIRED (FOR TRADED TARGETS)

#50	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.01240543**	**0.009912631**	**0.01261569**	**0.0172887**	**0.01749895**	**0.02229822**	**0.02119221**	**0.01998224**	**0.0192082**	**-0.00998439**	**-0.0024012**
CAR	0.62027147	0.495631529	0.63078431	0.86443484	0.87494768	1.11491102	1.05961032	0.99911183	0.96040994	-0.49921928	-0.12006021
σ(e)	0.03020644	0.085458289	0.03505165	0.04198072	0.04724693	0.0616223	0.0611442	0.06211101	0.06407055	0.03945872	0.03316875
Z-STAT	**2.90400448**	**0.820199933**	**2.54499805**	**2.91204053**	**2.61892778**	**2.55868775**	**2.4507891**	**2.27489065**	**2.11988932**	**-1.78921829**	**-0.51189991**
sig. level(0)	0.00368436	0.412102021	0.01092788	0.0035909	0.00882074	0.01050686	0.01425435	0.02291242	0.03401526	0.07357956	0.60872104
sig. level(+)	0.99815782	0.79394899	0.99453606	0.99820455	0.99558963	0.99474657	0.99287282	0.98854379	0.98299237	0.03678978	0.30436052
sig. level(-)	0.00184218	0.20605101	0.00546394	0.00179545	0.00441037	0.00525343	0.00712718	0.01145621	0.01700763	0.96321022	0.69563948

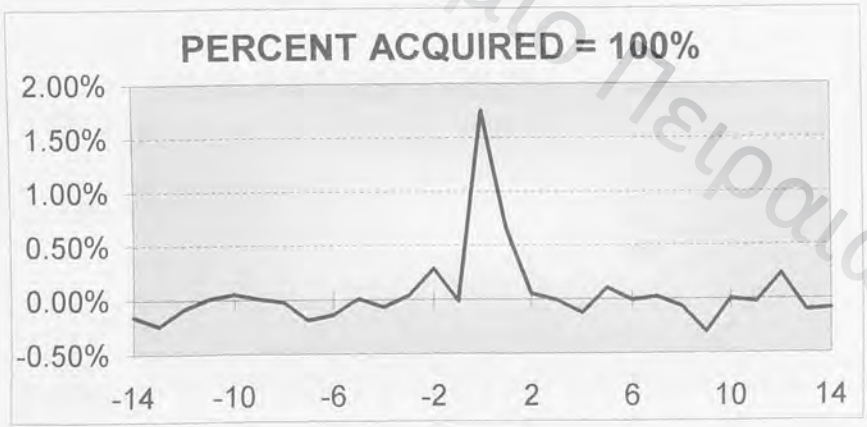
In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].



EVENTS WHERE 100% OF THE TARGET IS ACQUIRED (FOR TRADED TARGETS)

#28	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.01749353**	**0.016351756**	**0.01735369**	**0.02408695**	**0.02394711**	**0.02734448**	**0.02772122**	**0.02579894**	**0.02700736**	**-0.00745536**	**-0.00353737**
CAR	0.48981893	0.45784916	0.4859034	0.67443449	0.67051896	0.76564553	0.77619411	0.72237024	0.75620598	-0.20874996	-0.0990464
σ(e)	0.03624638	0.092191442	0.0410517	0.04852855	0.05408234	0.07283356	0.07184235	0.07310633	0.07302951	0.03778715	0.03452244
Z-STAT	**2.55382926**	**0.93854002**	**2.23686498**	**2.62641569**	**2.34302323**	**1.98663105**	**2.04178864**	**1.86735059**	**1.95687333**	**-1.04400652**	**-0.54219838**
sig. level(0)	0.0106546	0.347966923	0.02529508	0.00862901	0.01912815	0.04696316	0.04117236	0.06185252	0.05036222	0.29648242	0.58768179
sig. level(+)	0.9946727	0.826016539	0.98735246	0.99568549	0.99043592	0.97651842	0.97941382	0.96907374	0.97481889	0.14824121	0.2938409
sig. level(-)	0.0053273	0.173983461	0.01264754	0.00431451	0.00956408	0.02348158	0.02058618	0.03092626	0.02518111	0.85175879	0.7061591

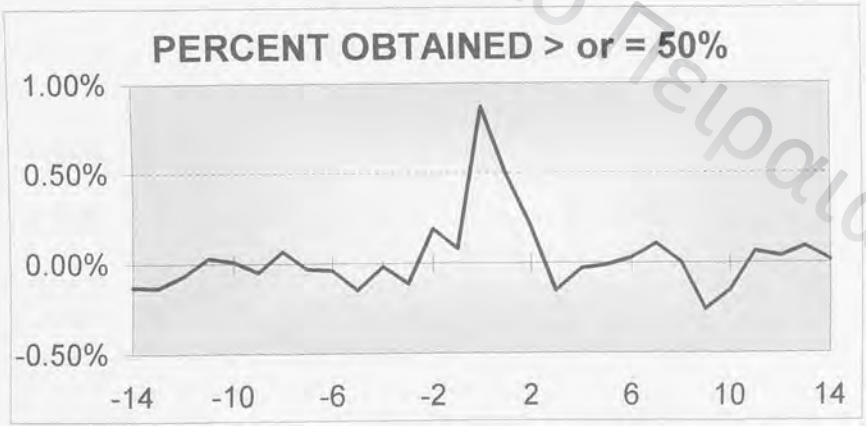
In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].



EVENTS WHERE AT LEAST 50% OF THE TARGET IS CUMULATIVELY OBTAINED AFTER THE DEAL (FOR TRADED TARGETS)

#67	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.00867955**	**0.009621579**	**0.00946782**	**0.01367238**	**0.01446065**	**0.01838564**	**0.01569902**	**0.01523865**	**0.01363514**	**-0.00617187**	**-0.00259219**
CAR	0.58152977	0.644645826	0.63434419	0.91604934	0.96886377	1.23183787	1.05183431	1.0209895	0.91355463	-0.41351561	-0.17367643
σ(e)	0.02780913	0.087724921	0.03246121	0.03952578	0.04473003	0.0566816	0.05719669	0.05701701	0.05944116	0.04307915	0.03440777
Z-STAT	**2.55474224**	**0.897761105**	**2.3873872**	**2.83139884**	**2.64622095**	**2.65505826**	**2.2466688**	**2.18765811**	**1.87762921**	**-1.17270129**	**-0.61666164**
sig. level(0)	0.0106267	0.369312856	0.01696859	0.00463461	0.00813975	0.00792956	0.02466112	0.02869441	0.06043178	0.24091573	0.53745781
sig. level(+)	0.99468665	0.815343572	0.99151571	0.99768269	0.99593013	0.99603522	0.98766944	0.98565279	0.96978411	0.12045786	0.26872891
sig. level(-)	0.00531335	0.184656428	0.00848429	0.00231731	0.00406987	0.00396478	0.01233056	0.01434721	0.03021589	0.87954214	0.73127109

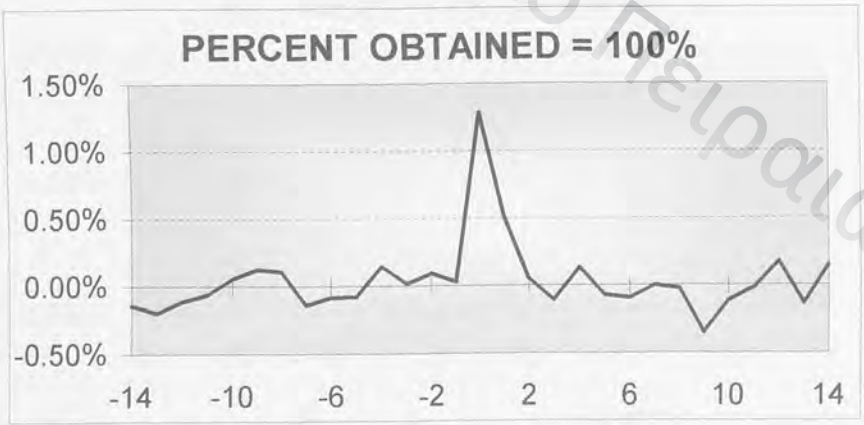
In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].



EVENTS WHERE 100% OF THE TARGET IS CUMULATIVELY OBTAINED AFTER THE DEAL (FOR TRADED TARGETS)

#39	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.01284838**	**0.011885214**	**0.01315604**	**0.01798259**	**0.01829025**	**0.01975357**	**0.01886666**	**0.02167301**	**0.02021975**	**-0.00343079**	**-0.00443757**
CAR	0.50108684	0.463523342	0.51308548	0.70132101	0.71331964	0.77038938	0.73579955	0.84524721	0.78857034	-0.13380088	-0.17306516
σ(e)	0.03319495	0.09034914	0.03814633	0.04658802	0.05224612	0.06961519	0.0696274	0.06812936	0.06796548	0.03798613	0.03562691
Z-STAT	**2.41717814**	**0.821514591**	**2.15379666**	**2.41051734**	**2.18623979**	**1.77204173**	**1.69218185**	**1.98663056**	**1.85788881**	**-0.56402924**	**-0.77785605**
sig. level(0)	0.01564135	0.411353098	0.03125601	0.0159299	0.02879796	0.07638753	0.09061125	0.04696321	0.06318468	0.57273416	0.43665374
sig. level(+)	0.99217932	0.794323451	0.984372	0.99203505	0.98560102	0.96180623	0.95469438	0.97651839	0.96840766	0.28636708	0.21832687
sig. level(-)	0.00782068	0.205676549	0.015628	0.00796495	0.01439898	0.03819377	0.04530562	0.02348161	0.03159234	0.71363292	0.78167313

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].



ALL THE DOMESTIC EVENTS (SAME NATION FOR TARGET ACQUIRER)

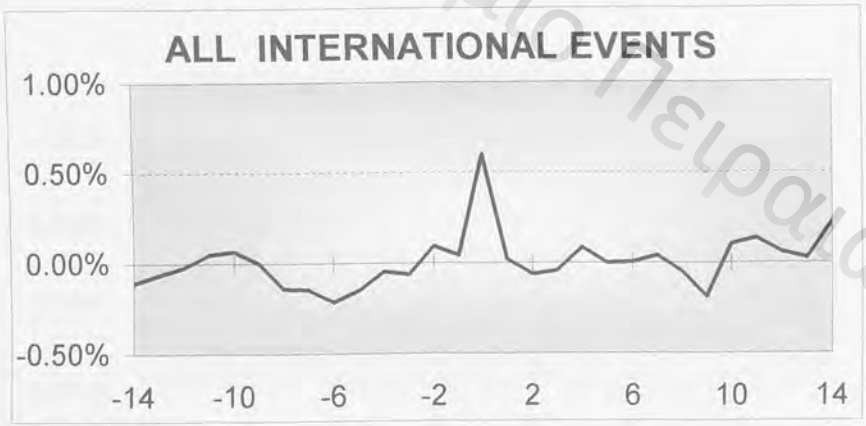
#144	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[2,14]
MEAN	0.003085738	0.001477353	0.003861306	0.004695222	0.00547079	0.006235258	0.004183161	0.005315934	0.00526027	-0.00325513	-0.00150277
CAR	0.444346312	0.2127389	0.556028102	0.67611204	0.78779383	0.897877162	0.602375113	0.765494523	0.757478869	-0.46873906	-0.2163992
σ(e)	0.017131472	0.072682954	0.021260434	0.026597654	0.030273071	0.040343208	0.041517564	0.041592265	0.046051198	0.040727531	0.036395737
Z-STAT	2.161452222	0.24391196	2.179432246	2.118332311	2.168577018	1.854664025	1.209076851	1.533727715	1.370718729	-0.95909541	-0.49547744
sig. level(0)	0.030660314	0.807299104	0.029299469	0.034146812	0.030114704	0.063644095	0.226633447	0.125096688	0.170462769	0.337510662	0.620263137
sig. level(+)	0.984669843	0.596350448	0.985350266	0.982926594	0.984942648	0.968177953	0.886683277	0.937451656	0.914768616	0.168755331	0.310131569
sig. level(-)	0.015330157	0.403649552	0.014649734	0.017073406	0.015057352	0.031822047	0.113316723	0.062548344	0.085231384	0.831244669	0.689868431

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].

ALL THE INTERNATIONAL EVENTS (DIFFERENT NATION FOR TARGET ACQUIRER)

#74	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	0.005995282	0.002506528	0.006425173	0.006193678	0.006623569	0.006948912	0.005883636	0.006251537	0.004741619	-0.00832927	0.003886884
CAR	0.443650887	0.185483051	0.475462806	0.458332152	0.490144071	0.514219454	0.435389081	0.462613758	0.350879804	-0.61636579	0.287629386
σ(e)	0.019097954	0.064954342	0.023258356	0.024947941	0.029030573	0.033198903	0.035234265	0.037242617	0.041008273	0.038893231	0.031951305
Z-STAT	**2.700465568**	**0.331955741**	**2.376411641**	**2.135648384**	**1.962692625**	**1.80056546**	**1.436469639**	**1.443984362**	**0.994651714**	**-1.84225032**	**1.046474839**
sig. level(0)	0.006924349	0.739922808	0.017481923	0.032707967	0.049681761	0.07177129	0.150868838	0.148743459	0.319905694	0.065438422	0.295341902
sig. level(+)	0.996537825	0.630038596	0.991259038	0.983646016	0.97515912	0.964114355	0.924565581	0.925628271	0.840047153	0.032719211	0.852329049
sig. level(-)	0.003462175	0.369961404	0.008740962	0.016353984	0.02484088	0.035885645	0.075434419	0.074371729	0.159952847	0.967280789	0.147670951

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].



ALL THE DOMESTIC EVENTS WITH TRADED TARGETS
(SAME NATION FOR TARGET ACQUIRER)

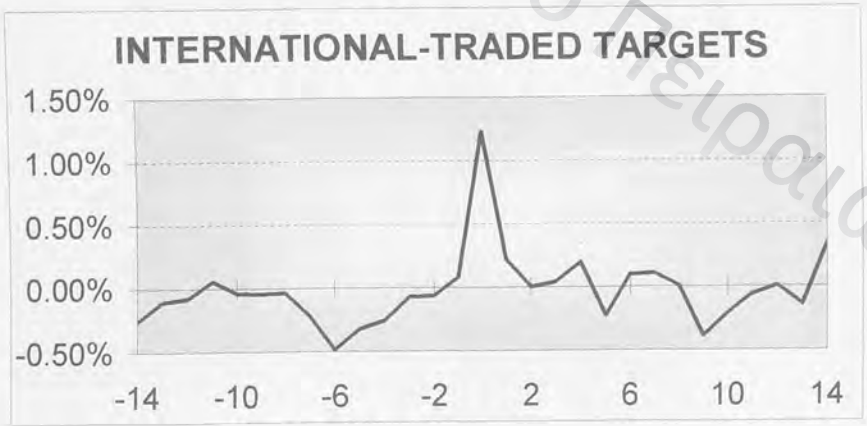
#67	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.006323923**	**0.006039016**	**0.008707038**	**0.011765092**	**0.014148206**	**0.018316534**	**0.014089851**	**0.012854521**	**0.012170739**	**-0.00856678**	**-0.00371074**
CAR	0.423702862	0.404614094	0.583371519	0.788261148	0.947929805	1.227207792	0.944019994	0.861252883	0.815439484	-0.57397437	-0.24861933
σ(e)	0.022673427	0.081488804	0.027069603	0.034898695	0.039483841	0.051861537	0.051343933	0.050884815	0.054082858	0.0468663	0.031307215
Z-STAT	**2.283004865**	**0.60660455**	**2.632848914**	**2.759456381**	**2.933049472**	**2.890914987**	**2.24623224**	**2.067783607**	**1.842021532**	**-1.49621646**	**-0.97018165**
sig. level(0)	0.022430017	0.54411327	0.008467279	0.005789874	0.00335664	0.003841353	0.024689056	0.038660243	0.065471879	0.134597313	0.331955945
sig. level(+)	0.988784992	0.727943365	0.995766361	0.997105063	0.99832168	0.998079324	0.987655472	0.980669878	0.96726406	0.067298657	0.165977972
sig. level(-)	0.011215008	0.272056635	0.004233639	0.002894937	0.00167832	0.001920676	0.012344528	0.019330122	0.03273594	0.932701343	0.834022028

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].

ALL THE INTERNATIONAL EVENTS WITH TRADED TARGETS
(DIFFERENT NATION FOR TARGET ACQUIRER)

#28	Day 0	[-14,+14]	[-1,0]	[0,1]	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-14,-3]	[3,14]
MEAN	**0.012287045**	**-0.00584307**	**0.013119244**	**0.01452076**	**0.015352958**	**0.014755297**	**0.014498631**	**0.013928033**	**0.008486341**	**-0.01834059**	**-0.00225777**
CAR	0.344037265	-0.16360593	0.367338819	0.40658127	0.429882824	0.413148314	0.405961677	0.389984934	0.237617536	-0.51353664	-0.0632176
σ(e)	0.028510969	0.080075949	0.032709602	0.036310274	0.040683813	0.045218295	0.046691261	0.048257415	0.051371513	0.034823451	0.03314572
Z-STAT	**2.28041821**	**-0.38611612**	**2.122328243**	**2.116112844**	**1.996868317**	**1.72668367**	**1.643124308**	**1.527231107**	**0.874132191**	**-2.78689506**	**-0.36043881**
sig. level(0)	0.02258283	0.699410774	0.033810062	0.034335089	0.04583935	0.084224414	0.100357186	0.126703593	0.382046182	0.005321689	0.718519126
sig. level(+)	0.988708585	0.349705387	0.983094969	0.982832456	0.977080325	0.957887793	0.949821407	0.936648204	0.808976909	0.002660845	0.359259563
sig. level(-)	0.011291415	0.650294613	0.016905031	0.017167544	0.022919675	0.042112207	0.050178593	0.063351796	0.191023091	0.997339155	0.640740437

In the graph below we can observe the Mean Abnormal Returns of the Rival Banks Portfolios, across the complete event window [-14,14].



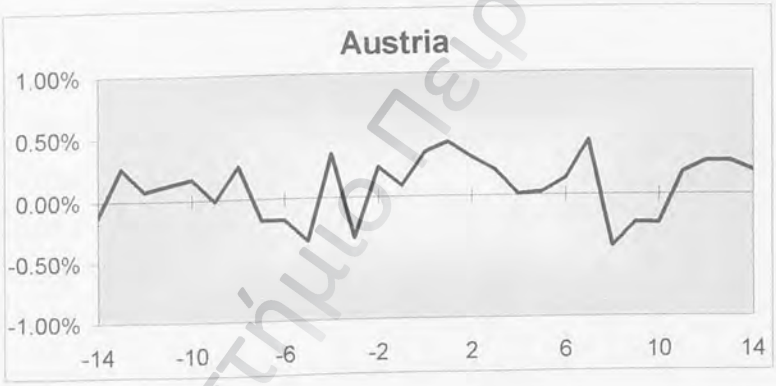
COUNTRY GRAPHS

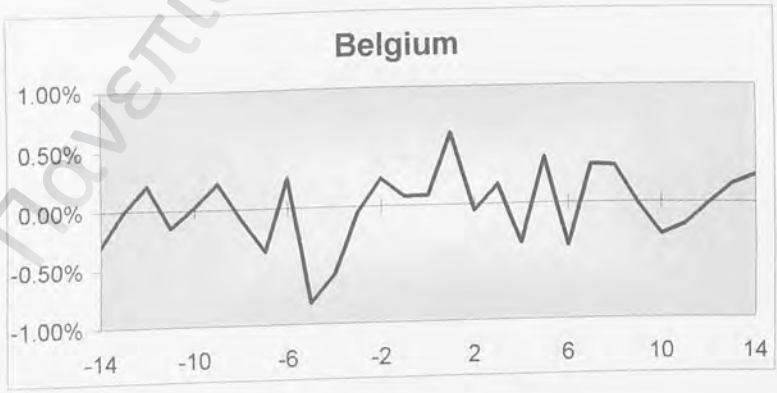
In the following pages we present each Country's Mean Abnormal Returns of the Rival Bank Portfolios across the complete event window [-14,14]. In this section we will not conduct any statistical processing of the Country Mean Abnormal Returns because :

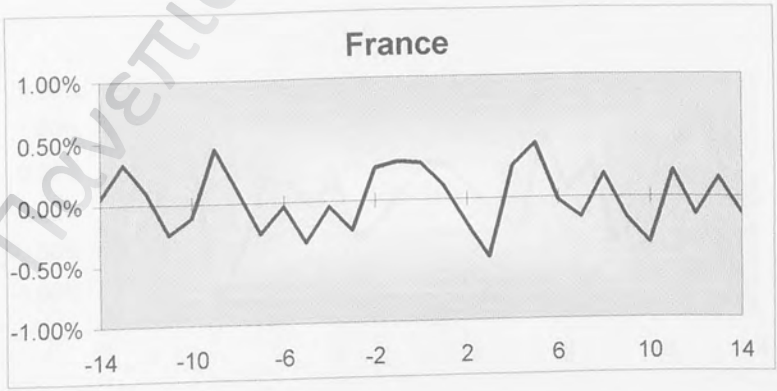
→ Our research treats all European Bank M&A announcements as a whole. We don't want to make any discrimination among the 17 European countries of our sample.

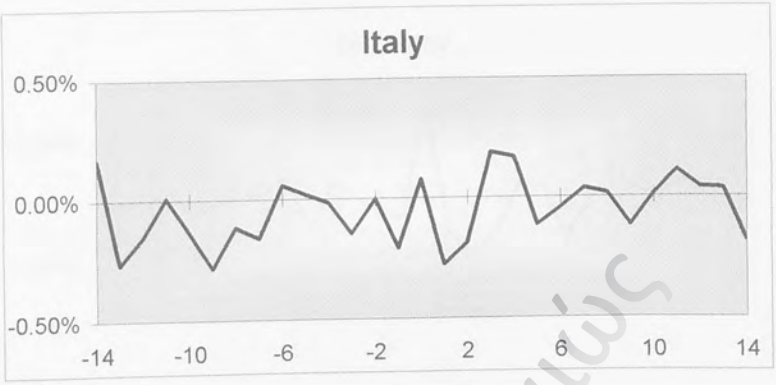
→ The Akhibge, Madura (1999) paper that set the base for our research, treated M&A announcements of different USA States as a whole. We want to examine whether European M&A Announcement Effects present any similarities to the USA ones.

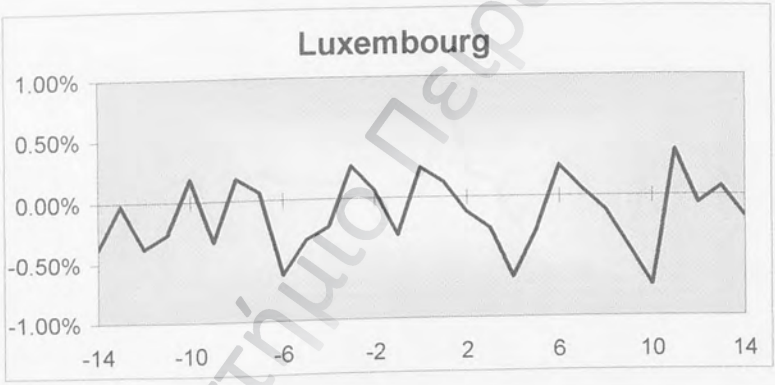
→ There are several difficulties in examining each country by its own, the main of which is the limited sample of announcements for several of the examined countries.

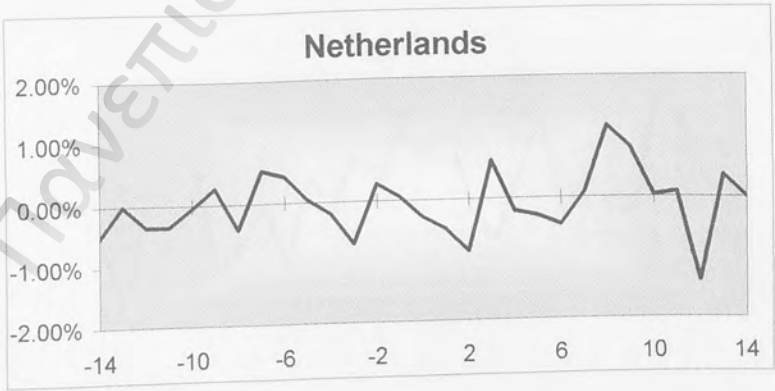


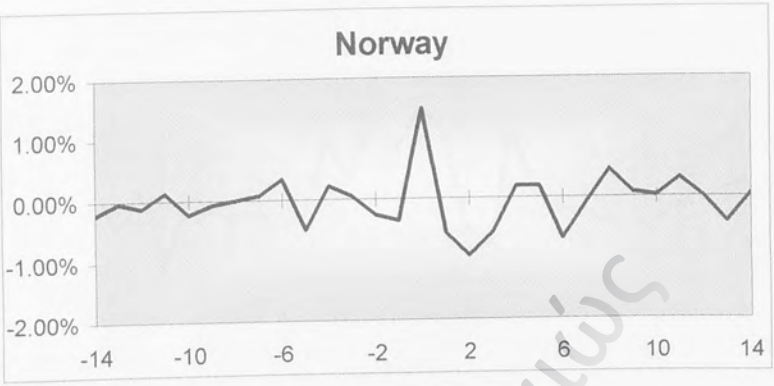


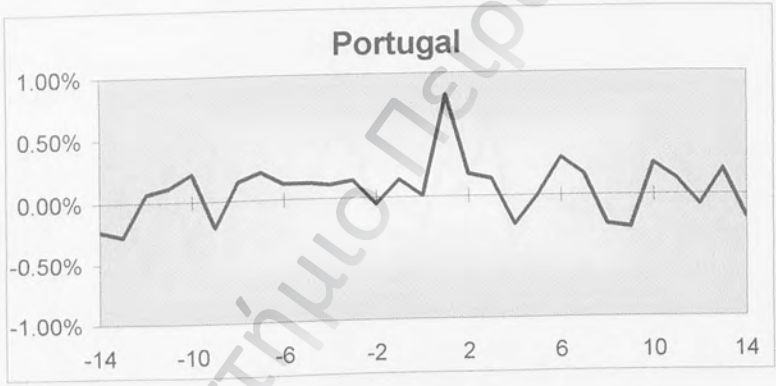


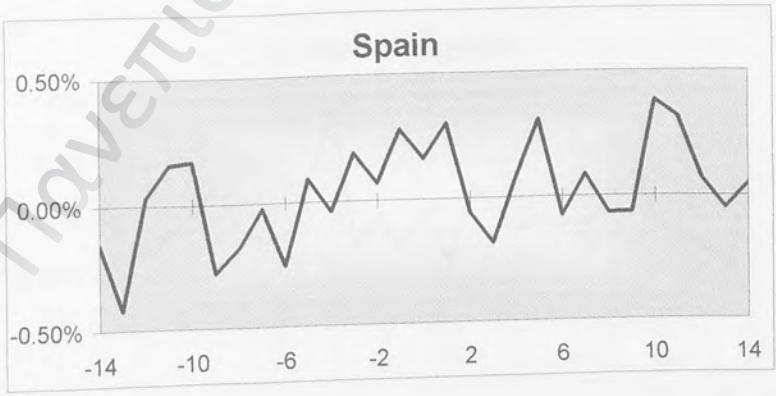


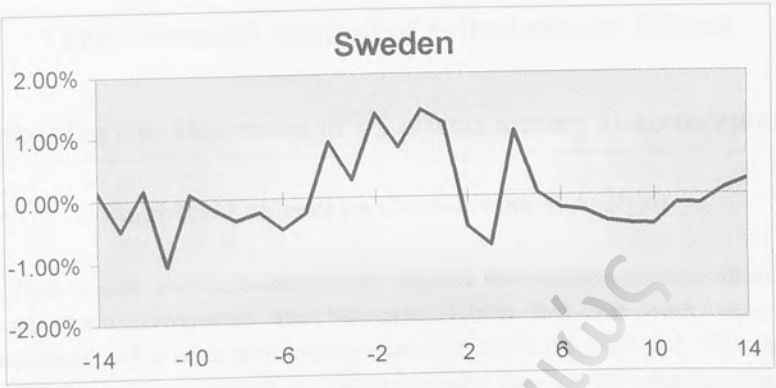


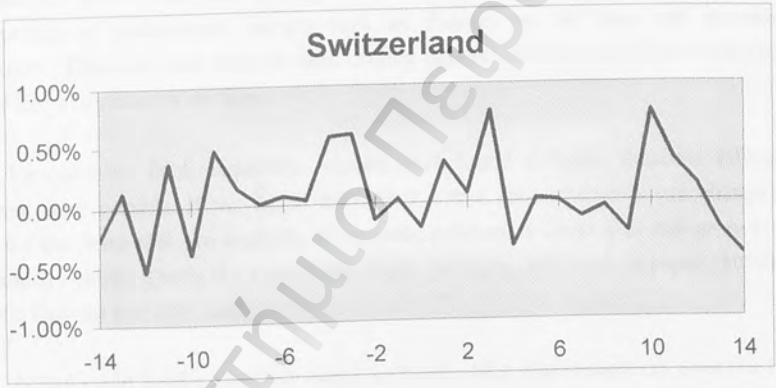


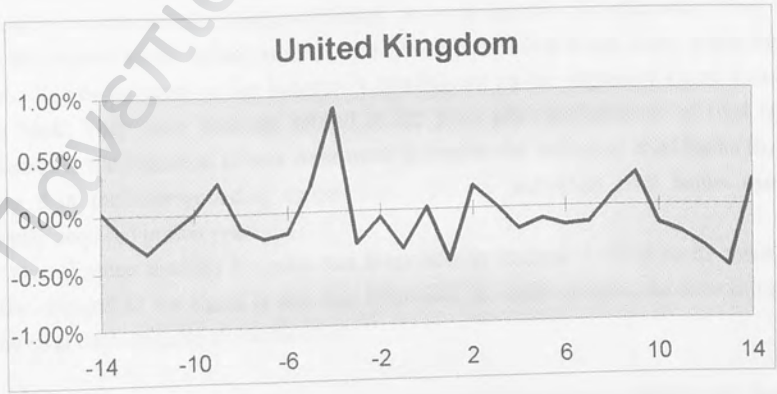












Cross-Sectional Analysis of Intra-Industry Effects

Explaining the dispersion of I-I effects among announcements

Empirical Evidence on Cross-Sectional Analysis

There is some empirical evidence that supports time-varying valuation effects to a particular event. Lakonishok and Vermaelen (1990) find that stock repurchase announcements led to more pronounced valuation effects in the 1960s and 1970s than in the 1980s. In addition, Eades et al. (1994) document time varying valuation effects in response to ex-dividend day pricing. They suggest that the time-varying effects are attributable to fundamental factors such as changes in tax laws and commission structures. They also find that the time varying pattern of valuation effects is dependent on the characteristics of the firm.

Furthermore, bank acquisition studies have found different valuation effects for different time periods. If the signal embedded within announcements can change over time for the firms that are engaging in financial policies, it could also change over time for industry rivals. That's the case in the Aigbe Akhigbe, Jeff Madura paper (1999) that sets the base for our own study.

Akhigbe and Madura studied American Bank M&A announcements over the 1983-1996 period and found favorable intra-industry effects. These effects across bank acquisition announcements were conditioned on event-specific characteristics. They were positively related to the valuation effects for the corresponding target bank, which implies that the degree of signal to the industry is conditioned on the degree of signal about the target bank. They were inversely related to the price prior performance of rival banks. Furthermore, the valuation effects were more favorable for individual rival banks that are smaller than the corresponding target bank, and for individual rival banks that are ultimately acquired in two years.

Overall, their analysis suggests that Bank M&As transmit a signal to its rivals, and that the strength of the signal is not only influenced by event-specific characteristics, but also by rival bank-specific characteristics.

Consequently, we can safely say that intra-industry effects within any specific industry may be time-varying.

Cross-Sectional Analysis of the Abnormal Returns

We **hypothesize** that intra-industry effects change over time because they are conditioned on the following event and rival-bank specific variables. We will now refer to all the variables tested in our models. They are based upon the variables used in the Akhigbe, Madura (1999) study in USA, but there where several additions and subtractions of variables made, mainly due to the difference of the European Banking Market (as a whole) compared to the USA one, and because of the limitations in the data used in our European Study. So, the main variables used in our models are :

➢ **CAR of target :** There are two competing hypotheses that could be advanced to explain the impact of target CAR on the intra-industry effects of bank M&A announcements.

- A positive relation between target CAR and Rival Bank Portfolio CAR is predicted if the M&A announcement contains information that could also benefit rival banks, or if rival banks become potential targets.
- Alternatively, a negative relation between target CAR and rival bank portfolio CAR is predicted if the MorA creates a large bank which is more cost-efficient than its weaker rivals.

The output of our statistical analysis (OLS) will clear out what kind of relation between target CAR and Rival Bank Portfolio CAR exists in our European Bank M&A sample.

We point out that this variable is used in a limited set of data, that refers only to the traded in the Stock Exchange Targets.

➢ **Targets Traded or Not :** Unfortunately, our sample of M&A announcements doesn't contain only Bank targets Quoted in their country's Stock Exchange. So, if we want to check whether the fact that a target is traded or not plays a key role to the signal transmitted to its rivals, we create a dummy variable which takes "1" in cases of traded targets and "0" when not traded.

We expect to find a positive and significant relation between Rival Bank Portfolio CAR and traded variable, which can be interpreted as a stronger signal transmitted by the traded target.

➢ **Deal Value :** The value of the Deal can prove to be a significant regulator of the signal transmitted to the rival Banks during the announcement of a Bank M&A. This hypothesis seams logical since the Deal Value shows the depth of the market of Bank

M&As and sets a standard for the forthcoming events. The higher the Deal Value announced, the higher the proportion of rival banks that can themselves become targets, on a future event with a similar Deal Value. It becomes clear, that the Greater the announced Deal Value the more Rival Banks it concerns, as a possibility of becoming MorA target, some time in the future.

So, a positive relation between Rival Bank Portfolio CAR and target deal Value, is predicted if the M&A announcement contains the amount of information described above. (A negative relation would simply mean that the possibility of rival banks being acquired or merged in the future, is not taken in positively by them.)

The natural logarithm of the announced Deal Value is used as a proxy for the size of the M&A deal that was announced. (The value of the Deal is in $ millions)

➢ **Rival bank size :** From the work of Atiase (1985), a general argument can be made that the information-signaling effects are inversely related to the relative size of the rival (e.g., Slovin et al., 1991). Furthermore, to the extent that the favorable intra-industry effects found here are attributed to an increased probability of being acquired, relatively small rival banks may benefit the most, because prospective acquiring banks can more easily afford to acquire the smaller rival banks.

Conversely, Baradwaj et al. (1996) suggest that relatively larger banks will not experience an increased probability of being acquired. Thus, intra-industry effects should be greater (smaller) for relatively small (large) rival banks.

The median natural logarithm of the market value of rival banks is used as a proxy for the size of rival bank. The market value is computed for the month-end prior to the announcement. (Market Value in € millions)

➢ **Recent stock price performance of rivals :** If bank rivals with weaker price performance have more potential to either be acquired-merged (because there is more potential to improve their performance) or to enhance their own performance in response to more favorable industry prospects, then they should experience a more favorable share price response than other rivals with superior performance.

The median stock price performance of rival banks is used as a proxy for performance (PERF). The stock price performance of each rival bank is measured as the difference between a Firm's actual stock return and the Datastream Total Market Index* return, averaged over a 12-month period prior to the corresponding Bank MorA announcement.

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* *The same Index was used in the Abnormal Return Estimations of Rival Bank Portfolios.*

➢ **Degree of local concentration :** In-market M&As (in which the acquiring bank and the target bank are headquartered in the same country) can create the potential for anticompetitive problems, by increasing the probability of collusion among rivals within the country or by eliminating competition from one of the rivals of a price leader*. To the extent that collusion among rival banks can increase their market power, an in-market M&A should have a favorable effect on the rival banks. This effect is expected to be greater for countries with higher premerger concentration levels. To test the relation between the degree of local concentration and the rival bank valuation effects, we use an interaction term between the premerger concentration level and in market acquisitions. A positive relation is expected between the interaction term and rival bank valuation effects.

The premerger concentration level is measured by the Herfindahl index, constructed as the squared sum of the fractions of total assets of all rival banks in the country in which the target bank is headquartered.

✓ We will now test the above variables, as interpreting variables of the CAR of the Rival Bank Portfolios, in response to the M&A announcement concerning European Banks.

Model 1 : Modeling all the Events

We use the following model in order to explain the cross-sectional variation in intra-industry effects of Bank M&A announcements over time. It contains 218 events, for all 17 European Countries participating in our research study. However the fact that this model contains all the events available, reduces the number of independent-explanatory variables. More specifically, the Riv_Car variable is not used, as it is not calculable for all targets (not all targets traded in their country's Stock Exchanges).

However, the Traded dummy variable is used instead, to account for the targets traded or not. Moreover, a variable to account for each case's degree of market concentration is not used in this model because the herfindahl index is not available for all 17 countries (218 events) that are being studied by this model. Later on, we will test this variable on another model that will contain events with available herfindahl index data.

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* *Eckbo (1985) tests this proposition for a sample of horizontal acquisitions across different industries, and finds no evidence of collusive, anticompetitive effects.*

MODEL 1 , 218 EVENTS

$$Riv\_Car_j = \lambda_0 + \lambda_1 Traded_j + \lambda_2 Deal\_Value_j + \lambda_3 Riv\_Size_j + \lambda_4 Riv\_Perf_j + \mu_j$$

⇨ Riv_Car_j is a two-day $Car_{[-1,0]}$ of the rival bank portfolio in response to the announced acquisition of bank j.

⇨ $Traded_j$ is dummy variable that shows whether the target of the MorA announcement is quoted in the Country's Stock Exchange. It takes a value of "1" when the target is quoted in the S.E. and the value of "0" if not.

⇨ $Deal\_Value_j$ is a natural logarithm of the Announced Deal Value of each event.

⇨ Riv_Size_j is a natural logarithm of median market capitalization of rival banks of target j at the month-end prior to the acquisition announcement.

⇨ Riv_Perf_j is the median prior price performance of rival banks. Each rival bank's performance is measured as the difference between a bank's actual stock return and the Datastream Total Market Index return averaged over a 12-month period prior to the announced acquisition of target bank j.

⇨ $\lambda_1, \ldots, \lambda_5$ are parameters to be estimated and

⇨ μ_j is an error term.

Results: The results of the regression analysis of intra-industry effects using Ordinary Least Squares Method (OLS), are disclosed in the table below :

Dependent Variable: **RIV_CAR**				
Method: **Least Squares**				
Sample (adjusted) : **1 218**				
Variable	**Coefficient**	Std. Error	**t-Statistic**	**Prob.**
C	**0.001903**	0.010795	**0.176270**	**0.8602**
TRADED	**0.008086**	0.002985	**2.708464**	**0.0073***
DEAL_VALUE	**0.002702**	0.001227	**2.203233**	**0.0287***
RIV_SIZE	**-0.002187**	0.001187	**-1.842378**	**0.0668****
RIV_PERF	**-0.006711**	0.004000	**-1.677881**	**0.0948****
R-squared	**0.085231**	Mean dependent var		0.004732

Adjusted R-squared	**0.068053**	S.D. dependent var	0.021939
S.E. of regression	0.021179	Akaike info criterion	- 4.848899
Sum squared resid	0.095546	Schwarz criterion	- 4.771273
Log likelihood	533.5300	**F-statistic**	**4.961448**
Durbin-Watson stat	2.063030	**Prob(F-statistic)**	**0.000764**

* Significant at the 0.05 level.
** Significant at the 0.1 level.

Before attempting to interpret our regression output in the table above, we must explain what each and every category stands for. So we will give a quick review of every category of the above regression output and what that means for our Models.

Estimation Method

After specifying our equation, we used as our estimation method the ***LS-Least Squares*** *method which performs single-equation regression.*

Equation Output

➢ *The "**coefficient**" measures the marginal contribution of the independent variable to the dependent variable, holding all other variables fixed.*

The coefficient of the C is the constant or intercept in the regression (it is the base level of the prediction when all of the other independent variables are zero).

The other coefficients are interpreted as the slope of the relation between the corresponding independent variable and the dependent variable, assuming all other variables do not change.

➢ *The "**Std. Error**" column reports the estimated standard errors of the coefficient estimates. The standard errors measure the statistical reliability of the coefficient estimates (the larger the standard errors, the more statistical noise in the estimates).*

➢ *The "**t-statistic**", which is computed as the ratio of an estimated coefficient to its standard error, is used to test the hypothesis that a coefficient is equal to zero.*

➢ *The last column of the output shows the "**probability**" of drawing a t-statistic as extreme as the one actually observed, under the assumption that the errors are normally distributed.*

This probability is also known as the p-value or the marginal significance level. Given a p-value, you can tell at a glance if you reject or accept the hypothesis that the true coefficient is zero against a two-sided alternative that it differs from zero. For

example, if you are performing the test at the 5% significance level, a p-value lower than .05 is taken as evidence to reject the null hypothesis of a zero coefficient.

The p-values are computed from a t-distribution with T-k degrees of freedom.

Summary Statistics

- *The "**R-squared**" statistic measures the success of the regression in predicting the values of the dependent variable within the sample. R-squared is the fraction of the variance of the dependent variable explained by the independent variables. The statistic will equal one, if the regression fits perfectly, and zero if it fits no better than the simple mean of the dependent variable. (It can also be negative if the regression does not have an intercept or constant, or if the estimation method is two-stage least squares).*

One problem with using R-squared as a measure of goodness of fit is that the R-squared will never decrease as you add more regressors. In the extreme case, you can always obtain an R-squared of one if you include as many independent regressors as there are sample observations.

- *The "**adjusted R-squared**", penalizes the R-squared for the addition of regressors which do not contribute to the explanatory power of the model.*

The adjusted R-squared is never larger than the R-squared, can decrease as you add regressors, and for poorly fitting models, may be negative.

- *The "**standard error of the regression**" is a summary measure based on the estimated variance of the residuals.*
- *The "**sum of squared residuals**" can be used in a variety of statistical calculations.*
- *The value of the "**log likelihood**" function is also reported, (assuming normally distributed errors) evaluated at the estimated values of the coefficients.*
- *The "**Durbin-Watson statistic**" measures the serial correlation in the residuals. See Johnston and DiNardo (1997) for a table of the significance points of the distribution of the Durbin-Watson statistic.*

As a rule of thumb, if the DW is less than 2, there is evidence of positive serial correlation.

- *The "**mean**" and "**standard deviation**" of the dependent variable, are computed using the standard statistic formulas.*
- *The "**AIC**" is often used in model selection for non-nested alternatives (smaller values of the AIC are preferred).*
- *The "**Schwarz Criterion (SC)**" is an alternative to the AIC that imposes a larger penalty for additional coefficients.*
- *The "**F-statistic**" tests the hypothesis that all of the slope coefficients (excluding the constant, or intercept) in a regression are zero.*

Under the null hypothesis with normally distributed errors, this statistic has an F-distribution with k-1 numerator degrees of freedom and T-k denominator degrees of freedom.

- *The "**p-value**" given just below the F-statistic, denoted as Prob. (F-statistic), is the marginal significance level of the F-test. If the p-value is less than the significance level you are testing, say .05, you reject the null hypothesis that all slope coefficients are equal to zero.*

The F-test is a joint test so that even if all the t-statistics are insignificant, the F-statistic can be highly significant.

Now, that we know what each category of the presented table stands for, we can move on to the explanation of the values of the coefficients, tests and etc. presented for our Model.

- The Constant variable of our model is insignificant, thereby it can be omitted.
- The coefficient for the Traded variable (dummy) is positive and significant (at the 0.05 level), suggesting that we have significantly higher intra-industry effects when the target of the M&A that takes place, is traded.
- The coefficient for the Deal_Value variable is positive and significant (at the 0.05 level), suggesting that the intra-industry effects are greater for bigger Deal Value Events.
- The coefficient for the Riv_Size variable is negative and significant (at the 0.1 level), providing support for the hypothesis that the intra-industry effects are stronger for relatively small rival bank portfolios.
- Finally, the Riv_Perf variable is negative and significantly related to the Riv_Car (at the 0.1 level), providing support for the hypothesis that the intra-industry effect in response to bank M&As is stronger in periods in which rival bank stock returns are relatively low.
- As for the Summary Statistics of this Model, the R-squared is only 0.085 and the adjusted one is even poorer. However, the F-statistic (significant even in the 0.1% significant level) shows a very good Model, as a whole.

We can also say that the model's residuals are serially uncorrelated, based on the DW statistic price, that is greater than 2. However, we conducted more thorough tests in the regression's residuals looking for serial correlation or heteroskedasticity, that could distort our results. So, we used the Correlogram of Residuals and Correlogram Squared Residuals analysis that are available in the E-Views Statistical Package. The above analysis proved that the residuals of our model are serially uncorrelated and don't exhibit

heteroskedasticity. The Correlogram Tables of the regression along with the regression output, are included in the Annex part of the Thesis*.

Model 2 : Modeling all the Events with available Herfindahl Data

We use the following model in order to explain the cross-sectional variation in intra-industry effects of Bank M&A announcements over time. It contains 194 events, for 15 European Countries (two less than the total). This model also (like the first) doesn't use the Riv_Car variable, as it is not calculable for all targets (not all targets are traded). However, a variable to account for each case's degree of market concentration is used. This is the herfindahl index, which is available for 15 out of the 17 countries (194 events) that are being studied by this model. The two missing are Norway and Switzerland that are not parts of the EE, and as a result the available data on ECB for them were limited.

MODEL 2 , 194 EVENTS

$$Riv\_Car_j = \lambda_0 + \lambda_1 Traded_j + \lambda_2 Deal\_Value_j + \lambda_3 Riv\_Size_j + \lambda_4 Riv\_Perf_j + \lambda_5 Herfindahl_j + \mu_j$$

⇨ Riv_Car_j is a two-day $Car_{[-1,0]}$ of the rival bank portfolio in response to the announced acquisition of bank j.

⇨ $Traded_j$ is dummy variable that shows whether the target of the MorA announcement is quoted in the Country's Stock Exchange. It takes a value of "1" when the target is quoted in the S.E. and the value of "0" if not.

⇨ $Deal\_Value_j$ is a natural logarithm of the Announced Deal Value of each event.

⇨ Riv_Size_j is a natural logarithm of median market capitalization of rival banks of target j at the month-end prior to the acquisition announcement.

⇨ Riv_Perf_j is the median prior price performance of rival banks. Each rival bank's performance is measured as the difference between a bank's actual stock return and the Datastream Total Market Index return averaged over a 12-month period prior to the announced acquisition of target bank j.

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* *In the Annex, a descriptive guide of the Correlogram Output tables, is also included.*

⇨ *Herfindahl*$_j$ is the premerger concentration level of the country in which the acquirer and the target banks are headquartered, obtained by multiplying the Herfindahl index by a dummy variable that takes on a value of one for in-market acquisitions, and zero for inter-country acquisitions. The Herfindahl index is computed as the squared sum of the fractions of total assets of all rival banks in the country in which the target bank j is headquartered. (The Herfindahl Index was available only for the 15 EE countries).

⇨ $\lambda_1, \ldots, \lambda_5$ are parameters to be estimated and

⇨ μ_j is an error term.

Results: The results of the regression analysis of intra-industry effects using Ordinary Least Squares Method (OLS), are disclosed in the table below :

Dependent Variable: **RIV_CAR**				
Method: **Least Squares**				
Sample(adjusted): **1 194**				
Variable	**Coefficient**	Std. Error	**t-Statistic**	**Prob.**
C	**0.004092**	0.011600	**0.352774**	**0.7247**
TRADED	**0.007816**	0.003151	**2.480214**	**0.0140***
DEAL_VALUE	**0.002218**	0.001310	**1.693519**	**0.0920****
RIV_SIZE	**-0.001900**	0.001258	**-1.510407**	**0.1326**
RIV_PERF	**-0.007224**	0.004220	**-1.711869**	**0.0886****
HERFINDAHL	**-0.007313**	0.028008	**-0.261110**	**0.7943**
R-squared	**0.071771**	Mean dependent var		0.004744
Adjusted R-squared	**0.047085**	S.D. dependent var		0.021345
S.E. of regression	0.020836	Akaike info criterion		- 4.873826
Sum squared resid	0.081618	Schwarz criterion		- 4.772758
Log likelihood	478.7611	**F-statistic**		2.907266
Durbin-Watson stat	1.785727	**Prob(F-statistic)**		0.014911

* Significant at the 0.05 level.

** Significant at the 0.1 level.

- The Constant variable of our model is insignificant, thereby it can be omitted.
- The coefficient for the Traded variable (dummy) is positive and significant (at the 0.05 level), suggesting that we have significantly higher intra-industry effects when the target of the M&A that takes place, is traded.

- The coefficient for the Deal_Value variable is positive and significant (at the 0.1 level), suggesting that the intra-industry effects are greater for bigger Deal Value Events.
- The coefficient for the Riv_Size variable is negative and insignificant (at the 0.1 level) but significant at the 0.15 level, providing faint support for the hypothesis that the intra-industry effects are stronger for relatively small rival bank portfolios.
- The Riv_Perf variable is negative and significantly related to the RIVCAR (at the 0.1 level), providing support for the hypothesis that the intra-industry effects in response to bank M&As are stronger in periods in which rival bank stock returns are relatively low.
- Finally, the coefficient for the Herfindahl variable is statistically insignificant, rejecting the hypothesis that the abnormal returns to rival banks of in-market M&As are positively related to the degree of concentration of the local markets. Thus, our evidence does not support the view that in-market M&As would have anticompetitive effects.
- As for the Summary Statistics of this Model, the R-squared is only 0.071 and the adjusted one is even poorer. We observe, that the second Model is worse than the first one, meaning that the addition of the Herfindahl index as an independent variable of the model, distorted our initially good results. That's becoming even more clear when observing the F-statistic that is important in the significance level of 15%.

We can also say that the model's residuals are serially uncorrelated, based on the DW statistic price, that is greater than the D_u level of the Durbin-Watson Test Tables. However, we conducted more thorough tests in the regression's residuals looking for serial correlation or heteroskedasticity, that could distort our results. So, we used the Correlogram of Residuals and Correlogram Squared Residuals analysis that are available in the E-Views Statistical Package. The above analysis proved that the residuals of our model are serially uncorrelated and don't exhibit heteroskedasticity. The Correlogram Tables of the regression along with the regression output, are included in the Annex part of the Thesis.

Model 3 : Modeling all the Events with Traded - S.E. Quoted Targets

We use the following model in order to explain the cross-sectional variation in intra-industry effects of Bank M&A announcements over time. It contains all the events that the target bank is traded on a Stock Exchange (95 events) and includes all 17 European Countries participating in our research study. So the Riv_Car variable is used instead of the Traded variable, used in the previous model.

Moreover, a variable to account for each case's degree of market concentration is not used in this model firstly because the herfindahl index is not available for all 17

countries (95 events) that are being studied by this model. Secondly, we have already checked the significance of this variable, that proved to be very poor (in Model 2). So, we will not continue checking this hypothesis (of Herfindahl's signifincance) further more.

MODEL 3 , 95 EVENTS

$$Riv\_Car_j = \lambda_0 + \lambda_1 Tar\_Car_j + \lambda_2 Deal\_Value_j + \lambda_3 Riv\_Size_j + \lambda_4 Riv\_Perf_j + \mu_j$$

⇨ Riv_Car_j is the two-day $Car_{[-1,0]}$ of each event rival bank portfolio in response to the announced acquisition of bank j.

⇨ Tar_Car_j is the two-day $Car_{[-1,0]}$ of target bank j in response to the announced acquisition of bank j

⇨ $Deal\_Value_j$ is a natural logarithm of the Announced Deal Value of each event.

⇨ Riv_Size_j is the natural logarithm of median market capitalization of rival banks of target j at the month-end prior to the acquisition announcement.

⇨ Riv_Perf_j is the median prior price performance of rival banks. Each rival bank's performance is measured as the difference between a bank's actual stock return and the Datastream Total Market Index return averaged over a 12-month period prior to the announced acquisition of target bank j.

⇨ $\lambda_1, \ldots, \lambda_5$ are parameters to be estimated and

⇨ μ_j is an error term.

Results: The results of the regression analysis of intra-industry effects using Ordinary Least Squares Method (OLS), are disclosed in the table below :

Dependent Variable: **RIV_CAR**				
Method: **Least Squares**				
Sample(adjusted): **1 95**				
Variable	**Coefficient**	Std. Error	**t-Statistic**	**Prob.**
C	**-0.008797**	0.021562	**-0.407981**	**0.6843**
TAR_CAR	**0.069653**	0.038345	**1.816494**	**0.0726****
DEAL_VALUE	**0.005106**	0.002194	**2.326819**	**0.0222***

RIV_SIZE	**-0.002262**	0.002522	**-0.896890**	**0.3722**
RIV_PERF	**-0.008385**	0.008296	**-1.010641**	**0.3149**
R-squared	**0.110590**	Mean dependent var		0.010008
Adjusted R-squared	**0.071061**	S.D. dependent var		0.028739
S.E. of regression	0.027699	Akaike info criterion		- 4.283674
Sum squared resid	0.069049	Schwarz criterion		- 4.149259
Log likelihood	208.4745	**F-statistic**		**2.797666**
Durbin-Watson stat	1.921773	**Prob(F-statistic)**		**0.030623**

* Significant at the 0.05 level.

** Significant at the 0.1 level.

- The Constant variable of our model is insignificant, thereby it can be omitted.
- The coefficient for the TARCAR variable is positive and significant (at the 0.1 level), suggesting that the intra-industry effects are more favorable when the valuation effect of the target bank is more favorable.
- The coefficient for the Deal_Value variable is positive and significant (at the 0.05 level), suggesting that the intra-industry effects are greater for bigger Deal Value Events.
- The coefficients for the Riv_Size and Riv_Perf variables are negative but insignificant. These variables lost their former significance because we filtered our initial sample, in order to get all the events with S.E. traded targets.

During this filtering we lost the 56.4% (only the 43.6% of the targets are traded) of our initial sample, and as a result these formerly significant variables (at the 0.01 level in model 1), lost their significance.

However, these conflicting results between the two Models (1 and 3) cannot lead us to the rejection of the initial two hypothesis that the intra-industry effects are stronger:

a) for relatively small rival banks and

b) in periods in which rival bank stock returns are relatively low.

✓ We have to point out that the Data used at the Riv_Size and Riv_Perf series are up to some degree problematic. That's because our main source of data, Datastream, presented several problems in calculating the Market Value of several of the rival Banks that constitute our examined portfolios. So we shouldn't so strongly reject the above variables from our models.

- As for the Summary Statistics of this Model, the R-squared is only 0.11 and the adjusted one is 0.07. However, the F-statistic shows a good Model, as a whole, significant at a 5% level.

We can also say that the model's residuals are serially uncorrelated, based on the DW statistic price, that is greater than the Du level of the Durbin-Watson Test Tables and close to "2". However, we conducted more thorough tests in the regression's residuals looking for serial correlation or heteroskedasticity, that could distort our results. So, we used the Correlogram of Residuals and Correlogram Squared Residuals analysis that are available in the E-Views Statistical Package. The above analysis proved that the residuals of our model are serially uncorrelated and don't exhibit heteroskedasticity. The Correlogram Tables of the regression along with the regression output, are included in the Annex part of the Thesis.

Model 4 : Testing some more independent variables

We do not use the following model in order to explain the cross-sectional variation in intra-industry effects of Bank M&A announcements over time, but in order to prove that the variables tested in this model are of no significance to the Rival Bank Portfolio CAR.

This model contains variables for all 218 events, for all 17 European Countries participating in our research study.

MODEL 4 , 218 EVENTS

$$Riv\_Car_j = \lambda_0 + \lambda_1 Per\_Acq_j + \lambda_2 Control_j + \lambda_3 Per\_Riv\_Acq_j + \lambda_4 Same\_Nat_j + \mu_j$$

⇨ Riv_Car_j is the two-day $Car_{[-1,0]}$ of each event rival bank portfolio in response to the announced acquisition of bank j.

⇨ Per_Acq_j is the percentage of the target j that is acquired. We must point out that not all the events concern an Acquisition of 100 % of the shares of the target (however, all the Merger cases concern the whole 100% of target's shares). There are several events where a percentage smaller than that of 100% is being acquired.

⇨ $Control_j$ is a dummy variable that shows whether the percentage of target's j shares held by the acquirer after the deal, gives the management control (through the majority of shares). In other worlds, if the percentage of target j, held by acquirer j after the event j, is greater than or equal to 50% then the $Control_j$ variable takes the value "1". Otherwise, it takes the value "0" that symbolizes that the acquirer j doesn't own the majority of target's j shares (after the last deal announcement).

⇨ $Per\_Riv\_Acq_j$ is the proportion of rival banks of target j that were acquired over an one-year period subsequent to the MorA announcement.

⇨ $Same\_Nat_j$ is a dummy variable that shows whether target j and acquirer j come from the same country. It takes the value "1" if they belong to the same country and "0" if not.

Dependent Variable: **RIV_CAR**				
Method: **Least Squares**				
Sample(adjusted): **1 218**				
Variable	**Coefficient**	Std. Error	**t-Statistic**	**Prob.**
C	**0.008422**	0.004609	**1.827233**	**0.0691**
PER_ACQ	**0.003249**	0.008066	**0.402735**	**0.6875**
CONTROL	**-0.004508**	0.006300	**-0.715487**	**0.4751**
PER_RIV_ACQ	**-0.001497**	0.004823	**-0.310319**	**0.7566**
SAME_NAT	**-0.002089**	0.003213	**-0.650187**	**0.5163**
R-squared	**0.006244**	Mean dependent var		0.004732
Adjusted R-squared	**-0.012419**	S.D. dependent var		0.021939
S.E. of regression	0.022075	Akaike info criterion		- 4.766078
Sum squared resid	0.103796	Schwarz criterion		- 4.688452
Log likelihood	524.5025	**F-statistic**		**0.334559**
Durbin-Watson stat	2.106918	**Prob(F-statistic)**		**0.854503**

Looking at the above regression results, we can strongly say that for all our events studied :

- the percent of shares of the target that according to the announcement will be acquired,
- the fact that the control of the target company is taken or not by the acquirer,

– the percent of the rival Banks that are acquired 1 year after the announcement of the event and
– whether we have a domestic or international M&A,

are TOTALLY INSIGNIFICANT to the observed Abnormal Returns of the Rival Bank Portfolios as explanatory variables.

We will not comment on any of the model's numerical results, as they are clearly demonstrative of the models inefficiency to describe Rival Banks CAR. The only reason that this model was included in our analysis, is to provide proof that all its independent variables are of non-significance as explanatory variables to the studied Rival Bank's Cumulative Abnormal Return Effects.

However, we have to say that "the other side of the coin" for the variable Per_Riv_Acq (percent of rivals that was eventually acquired in an 1-year period of time), indicates that :

a. the time period of 1-year after the event is limited. We should have at-least 2-years time period in order to check the implications of the announcement in terms of the percent of rivals being consequently to the announcement acquired. However, if we did so, our data would be significantly reduced.

b. In order to identify such sort of trend in our sample we need to study a much bigger sample of data (announcements) for a bigger time period (at least 10 years). That way we would be able to identify a trend in the behavior of the rivals in response to a M&A announcement.

✓ We expected to find the variable Per_Riv_Acq positive and significantly related to Riv_Car, suggesting that the intra-industry effects are more favorable for rivals that are ultimately acquired*.

Instead, we totally rejected this hypothesis, but carefully pointed out some questions on the credibility of the amount of the sample used to reach to that conclusion.

* *Those were the findings of Akhigbe, Madura(1999) in their research.*

Conclusion

Bank M&A announcements can signal prospects for the banking industry as a whole. Since the value of a bank is partially dependent on prospects of the industry, rival bank values can respond to a bank M&A announcement.

Our analysis of 218 European bank M&A announcements over the 1996-2001 period, confirms favorable intra-industry effects in response to announcements of bank M&As. Specifically, the Mean Portfolio Abnormal Return for the event window [-1,0] is 0.47% and rises up to 0.58% for the [-1,1] window. Furthermore, when examining only the 95 cases where the target was traded in a Stock Exchange, we got a Mean Portfolio Abnormal Return for the event window [-1,0] equal to 1% and 1.4% for the [-1,1] window. This evidence suggests that the revaluation of all rival banks begins together with the announcement of the M&A.

The intra-industry effects across bank M&A announcements are conditioned on event and rival bank specific characteristics. They are positively related to the valuation effects for the corresponding target bank, which implies that the degree of signal to the industry is conditioned on the degree of signal about the target bank. They are inversely related to the prior price performance of rival banks. Furthermore, the valuation effects are more favorable for smaller rival bank portfolios and for announcements with high Deal Value.

However, several characteristics didn't prove to be significant for the valuation effects noticed in the targets. These are the percent of shares of the target that according to the announcement will be acquired, the fact that the control of the target company is taken or not by the acquirer, the percent of individual rival Banks that are ultimately acquired in 1 year after the announcement of the event and whether we have a domestic or international M&A.

Finally, we rejected the hypothesis that the abnormal returns to rival banks of in-market mergers and acquisitions are positively related to the degree of concentration of the local markets. Thus, our evidence does not support the view that in-market acquisitions would have anti-competitive effects.

Overall, our analysis suggests that bank M&As transmit a signal about bank rivals, and that the strength of the signal is not only influenced by event-specific characteristics, but also by rival bank-specific characteristics.

Annex : Definitions

Acquisitions: A company buying shares in another company to achieve a managerial influence. An acquisition may be of a minority or of a majority of the shares in the acquired company. An acquisition is recorded on the date of the economic decision (formally agreed) even if the legal issues have not been fully finalized. If subsequent disputes, legal issues or a lack of supervisory approval were to interfere with a completion of the acquisition, it is held not to have been recorded.

Bancassurance: Is a phenomenon where regulations (in EU) allow banks to own insurance subsidiaries and to perform direct distribution of insurance products.

Categories of banks: Commercial banks, savings banks and co-operative banks.

Consolidation: A merger or an acquisition - whether within a sector of the financial industry or across sectors - that reduces the number of operational institutions or even groups.

Financial conglomerate: A group of financial companies operating in different sectors of the financial industry. The largest and/or "leading" company in a conglomerate may be a credit institution, an insurance company, a holding company or another financial institution.

Merger: Two or more companies joining together. The new entity can be at holding level or at company level. A merger is recorded on the date of the economic decision (formally agreed) even if the legal issues have not been fully finalized. If subsequent disputes, legal issues or a lack of supervisory approval were to interfere with a completion of the merger, it is held not to have been recorded.

Sectors of the financial industry: Credit institutions, insurance companies, asset management companies, investment companies, undertakings for collective investment in transferable securities *(UCITS)* and other financial companies.

Annex : The way European M&As are carried out

The legal structures of institutions and conglomerates differ, not only between Member States but also between institutions and conglomerates within a country. So does the choice of legal structure in connection with M&As. The choice of structure is sometimes motivated by tax reasons. Without being a common tendency across all Member States, the holding structure seems to be a more recent phenomenon, which has become popular in some Member States. Credit institutions might be the main company of a conglomerate, in practice owning the other activities. The coordinating and managerial function might, however, also be performed by a holding company.

In a number of cases an initial acquisition involving credit institutions, is followed, at a later stage, by a merger. This appears especially to be the case when the geographic and business areas overlap. Another way of achieving an integration of organisations with a similar effect to that of a merger is a substantial re-organisation of the central functions. If either the geographic distribution differs, the banks are located in different regions of the same country or different countries (international bank M&As), or the business areas are clearly different - for example, a retail/corporate bank in an M&A with an investment bank - a merger is much less likely to follow the initial acquisition.

The aim is often to maintain a recognised brand name, which can be achieved by a merger at the holding company level. When a domestic bank M&A takes place, two subsidiaries belonging to the same sector of the financial industry and located in the same foreign country will be merged. In relation specifically to international bank M&As, a successful acquisition in another country, whether within the EEA or in a third country, is sometimes followed by another acquisition some years later. In some cases mergers have features of "acquisitions in disguise": by the choice of a merger managers and shareholders of the "acquired" enterprises may be "pleased".

As for both domestic and international bank M&As, the cases analysed provide no evidence of differences in how they are carried out depending on the size of the institutions involved. The geographic and business area differences or similarities are the decisive factors.

Specifically for bancassurance, four different sequences of increasing integration can be distinguished. First, banks may provide insurance products simply through co-operation agreements with existing insurance companies. The bank will typically distribute insurance products labelled with the name of the insurance company. Second, banks and insurance companies may decide to establish joint ventures to provide

insurance products through the distribution network of the bank and, most commonly, under a name associated with the bank. Third, banks may decide to establish subsidiaries to develop the insurance business area and the products to be distributed through the banks network(s). Fourth, banks and insurance companies can merge on a holding level or a bank can acquire an insurance company to become a subsidiary of the bank. The two latter sequences would constitute conglomerates.

The creation of conglomerates, whether domestic or international, has been either through holding company structures or through acquisitions. Restrictions on, for instance, the conduct of banking and insurance business from one legal entity eliminates the possibility for an acquisition to become a merger, or a merger to take place initially. International conglomeration has followed generally as a second step to an international bank M&A, whereby the range of products on the foreign market has been extended to take advantage of cross-selling possibilities.

Cross-border banking groups and conglomerates, of which three cases are mentioned below, have from the outset chosen a complex group structure in a holding company form. They achieved an "economic merger" with equal ownership and fully shared management responsibilities. All three cases (the Fortis group, the Dexia group and the MeritaNordbanken group - now known as Nordea) have recently adopted, or are about to adopt, a more simplified structure to streamline managerial procedures and eliminate the effect of market inefficiencies picking up on different holding companies and leading to shares in the same group trading at different prices. The simplification has also made the supervisory lines of responsibility more clear. Memoranda of understanding have, since the establishment of the three institutions, secured supervisory access and monitoring of the groups, including the distribution of consolidated supervision.

Three cases of cross-border M&As, their organisation and supervision

In 1990 the Belgian AG and the Dutch Amev, both insurance companies, decided to have an economic merger of their activities under the name "Fortis". A bi-national consortium structure was chosen, because no adequate legal form was available for two companies of a different nationality to integrate their activities on an equal footing. The group acquired a number of banks, and the Belgian and Dutch supervisors set up the necessary arrangements for the supervision of the group as a whole as well as for the banking activities. This was done in two memoranda, the "four parties covenant" (signed by the banking and insurance supervisors) and the "two parties

covenant" (signed by the banking supervisors). In the "four parties covenant", the Belgian banking supervisor was designated as the coordinating supervisor, responsible for receiving the reporting of the group, performing a first assessment, and organising the consultation process between the four supervisors. In the "two parties covenant", the Belgian banking supervisor was designated as the central supervisor, charged with the consolidated supervision of the banking activities of the group. In 1999, owing to new acquisitions, the ownership structure of Fortis changed and the group structure was simplified. In the light of these changes, the supervisory arrangements have been reviewed.

In 1996, the Belgian Crédit Communal de Belgique and the French Crédit Local de France created the banking group "Dexia" modelled on the Fortis structure. In order to ensure an adequate consolidated supervision of the group, a memorandum providing for a two-tier supervision was concluded between the Belgian and the French banking supervisors. First, the two banks continued to be supervised by their respective supervisors. Secondly, prudential supervision of the group as a whole is carried out on the basis of a supervision equivalent to a credit institution heading a group. No central supervisor was designated for this consolidated supervision, but each supervisor in turn acted for a period of two years as a technical co-ordinator. In 1999, the joint structure of the Dexia group was unwound, and replaced by a single holding company incorporated in Belgium and heading all activities. The supervisory implications were that the Belgian banking supervisor became responsible for the consolidated supervision of the group. Because of the importance of the different components of the group, this consolidated supervision will be performed in close co-operation with the other European banking supervisors involved.

The Finnish-Swedish MeritaNordbanken was formed in 1998 through "an economic merger" - or an ownership arrangement like that seen for the Fortis and the Dexia groups. The issuance of common shares and preference shares made it possible to distribute voting rights equally and a co-operation agreement achieved a full sharing of management responsibilities. The financial holding company - MeritaNordbanken - was registered in Finland. The Finnish Financial Supervisory Authority was responsible for consolidated supervision. An MoU (Memoranda of Understanding) between the Finnish and Swedish supervisory authorities had an appendix relating to MeritaNordbanken, requesting, among other things, planning and from time to time conduct of inspections in co-operation, and the exchange of supervisory information at regular meetings. In

October 1999 a proposal to simplify the ownership structure was put forward, according to which a new holding company, Nordic Baltic Holding, registered in Sweden, became the sole owner of MeritaNordbanken, which remained registered in Finland. In the first half of 2000, Nordic Baltic Holding acquired the holding company of Danish Unibank (Unidanmark), which also included substantial insurance activities in Denmark and Norway. The banking and insurance supervisors in all four Scandinavian countries now have a special MoU on the supervision of the holding company (now named Nordea) and the banking and insurance activities.

All three cases described above still involve a holding company registered in one country. The legal structure for a supra-national European company does not exist.

Finding the appropriate legal and organisational structure seems to be a major challenge in merging and acquiring institutions. In cases where a matrix management or management by product line is followed, the legal structure does not correspond fully to the managerial structure and the governing bodies of financial services groups may have difficulties in ensuring the smooth functioning of the group as a whole and, in particular, compliance with rules.

The European legal framework relevant to M&As involving credit institutions is laid down in Article 11 of the Second Banking Directive*. According to the relevant provisions, acquirers of a qualifying holding in a credit institution must inform the competent authority. The Directive sets out certain thresholds, the crossing of which triggers the notification obligation. Once notified, the competent authorities have a period of three months to oppose the plan. A veto can be issued if, in view of the need to ensure sound and prudent management, the competent authority is not satisfied with the suitability of the acquirer. The implementation of this provision differs slightly across Member States. There are some differences concerning the calculation of the thresholds and, in some cases, the right to veto is implemented as an obligation to obtain an authorisation.

Furthermore, Article 2 of the so-called post-BCCI Directive* is a key provision in relation to the authorisation of M&As. Banking supervisors can, according to the article, influence the structure of the new group resulting from an M&A. The provision obliges banking supervisors to refuse granting the licence if the structure of the group is an obstacle to their supervision on an individual or a consolidated basis.

* *Directive 89/646/EEC.*
* *Directive 95/26/EEC.*

Annex : Statistical Section

In this part we include the Correlogram tables that we talked about in an earlier part of the thesis (Cross Sectional Analysis). So, we will now give a quick review of every category of the Correlogram Outputs and what they mean for our Models. *(The correlogram tables just come after this analysis.)*

Residual Tests

We conducted tests for serial correlation and heteroskedasticity, in the residuals from our estimated equations.

Correlograms of Residuals

This view displays the autocorrelation and partial autocorrelation functions up to the specified order of lags. These functions characterize the pattern of temporal dependence in the series and typically makes sense only for time series data.

*"**Autocorrelations" (AC)** is the correlation coefficient for values of the series k periods apart. If is nonzero, it means that the series is first order serially correlated.*

The dotted lines in the plots of the autocorrelations are the approximate two standard error bounds. If the autocorrelation is within these bounds, it is not significantly different from zero at (approximately) the 5% significance level.

*The "**partial autocorrelation**" at lag k measures the correlation of y values that are k periods apart after removing the correlation from the intervening lags. If the pattern of autocorrelation is one that can be captured by an autoregression of order less than k, then the partial autocorrelation at lag k will be close to zero.*

The dotted lines in the plots of the partial autocorrelations are the approximate two standard error bounds. If the partial autocorrelation is within these bounds, it is not significantly different from zero at (approximately) the 5% significance level.

*The last two columns reported in the correlogram are the Ljung-Box Q-statistics and their p-values. The "**Q-statistic**" at lag k is a test statistic for the null hypothesis that there is no autocorrelation up to order k.*

Correlograms of Squared Residuals

This view displays the autocorrelations and partial autocorrelations of the squared residuals up to any specified number of lags and computes the Ljung-Box Q-statistics for the corresponding lags. The correlograms of the squared residuals can be used to check autoregressive conditional heteroskedasticity (ARCH) in the residuals.

If there is no ARCH in the residuals, the autocorrelations and partial autocorrelations should be zero at all lags and the Q-statistics should not be significant.

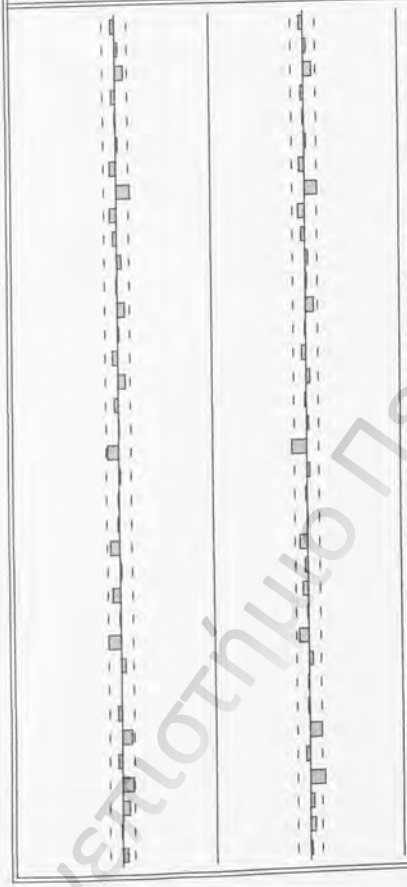
Dependent Variable: RIV_CAR
Method: Least Squares
Date: 06/18/02 Time: 12:07
Sample(adjusted): 1 218
Included observations: 218 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001903	0.010795	0.176270	0.8602
TRADED	0.008086	0.002985	2.708464	0.0073
DEAL_VALUE	0.002702	0.001227	2.203233	0.0287
RIV_SIZE	-0.002187	0.001187	-1.842378	0.0668
RIV_PERF	-0.006711	0.004000	-1.677881	0.0948

R-squared	0.085231	Mean dependent var	0.004732
Adjusted R-squared	0.068053	S.D. dependent var	0.021939
S.E. of regression	0.021179	Akaike info criterion	-4.848899
Sum squared resid	0.095546	Schwarz criterion	-4.771273
Log likelihood	533.5300	F-statistic	4.961448
Durbin-Watson stat	2.063030	Prob(F-statistic)	0.000764

Correlogram of Residuals

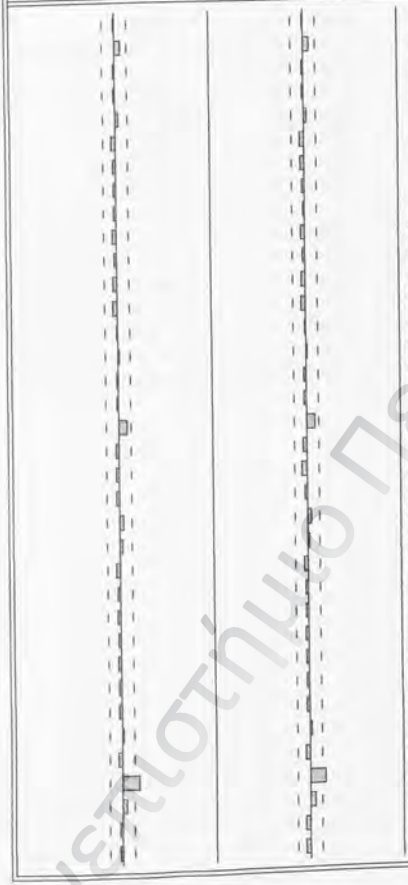
Date: 06/18/02 Time: 12:08
Sample: 1 218
Included observations: 218



	AC	PAC	Q-Stat	Prob
1	-0.033	-0.033	0.2443	0.621
2	0.040	0.039	0.6065	0.738
3	0.091	0.094	2.4564	0.483
4	-0.037	-0.032	2.7582	0.599
5	-0.005	-0.015	2.7644	0.736
6	0.032	0.026	3.0011	0.809
7	-0.062	-0.053	3.8641	0.795
8	0.150	0.147	9.0288	0.340
9	-0.073	-0.068	10.252	0.330
10	-0.034	-0.039	10.514	0.397
11	0.057	0.033	11.266	0.421
12	-0.004	0.021	11.270	0.506
13	0.087	0.098	13.055	0.444
14	0.017	-0.004	13.123	0.517
15	-0.052	-0.044	13.769	0.543
16	0.087	0.046	15.550	0.485
17	-0.039	-0.015	15.914	0.530
18	0.011	0.029	15.941	0.597
19	-0.121	-0.163	19.452	0.428
20	0.024	0.037	19.588	0.484
21	-0.006	-0.013	19.597	0.547
22	-0.014	0.011	19.642	0.605
23	-0.092	-0.080	21.707	0.538
24	0.019	-0.029	21.799	0.591
25	-0.078	-0.050	23.318	0.559
26	-0.001	-0.008	23.318	0.615
27	-0.132	-0.105	27.724	0.425
28	0.057	0.048	28.536	0.436
29	0.004	-0.007	28.539	0.489
30	-0.040	-0.012	28.939	0.521
31	0.111	0.133	32.073	0.413
32	-0.036	-0.040	32.408	0.447
33	0.128	0.167	36.649	0.303
34	0.088	0.047	38.685	0.266
35	-0.008	0.065	38.700	0.306
36	0.060	0.025	39.656	0.310

Correlogram of Residuals Squared

Date: 06/18/02 Time: 12:10
Sample: 1 218
Included observations: 218



	AC	PAC	Q-Stat	Prob
1	-0.001	-0.001	9.E-05	0.993
2	0.069	0.069	1.0640	0.587
3	-0.016	-0.016	1.1221	0.772
4	-0.011	-0.016	1.1516	0.886
5	0.037	0.039	1.4546	0.918
6	-0.045	-0.044	1.9221	0.927
7	-0.030	-0.036	2.1303	0.952
8	-0.024	-0.017	2.2670	0.972
9	-0.019	-0.015	2.3493	0.985
10	-0.034	-0.035	2.6091	0.989
11	-0.021	-0.017	2.7078	0.994
12	-0.039	-0.035	3.0631	0.995
13	-0.043	-0.045	3.5037	0.995
14	-0.003	-0.002	3.5062	0.998
15	0.019	0.023	3.5871	0.999
16	-0.011	-0.016	3.6138	0.999
17	-0.016	-0.022	3.6733	1.000
18	0.091	0.092	5.6449	0.997
19	-0.029	-0.035	5.8434	0.998
20	-0.028	-0.051	6.0291	0.999
21	-0.026	-0.019	6.1897	0.999
22	0.042	0.047	6.6169	0.999
23	0.038	0.025	6.9657	0.999
24	-0.035	-0.038	7.2602	1.000
25	-0.021	-0.021	7.3652	1.000
26	-0.028	-0.024	7.5606	1.000
27	-0.022	-0.027	7.6825	1.000
28	-0.028	-0.023	7.8779	1.000
29	-0.022	-0.017	8.0050	1.000
30	-0.032	-0.030	8.2714	1.000
31	0.021	0.028	8.3871	1.000
32	-0.039	-0.042	8.7742	1.000
33	0.190	0.180	18.087	0.984
34	0.049	0.058	18.723	0.984
35	-0.018	-0.043	18.806	0.988
36	-0.023	-0.047	18.946	0.991

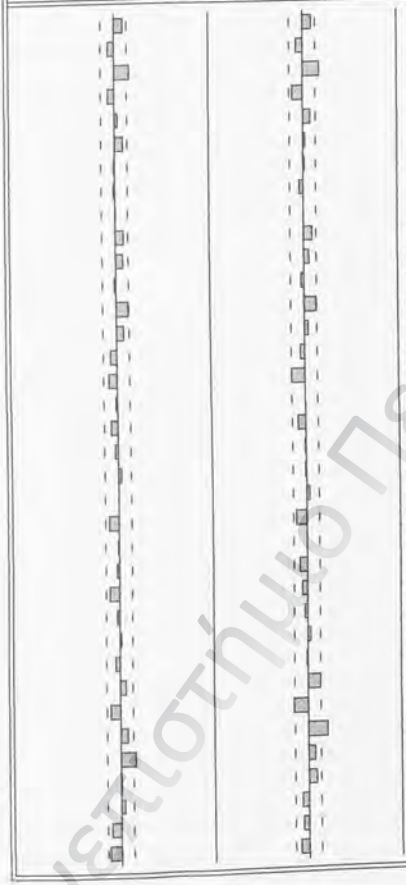
Dependent Variable: RIV_CAR
Method: Least Squares
Date: 06/18/02 Time: 12:13
Sample(adjusted): 1 194
Included observations: 194 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004092	0.011600	0.352774	0.7247
TRADED	0.007816	0.003151	2.480214	0.0140
DEAL_VALUE	0.002218	0.001310	1.693519	0.0920
RIV_SIZE	-0.001900	0.001258	-1.510407	0.1326
RIV_PERF	-0.007224	0.004220	-1.711869	0.0886
HERFINDAHL	-0.007313	0.028008	-0.261110	0.7943

R-squared	0.071771	Mean dependent var	0.004744
Adjusted R-squared	0.047085	S.D. dependent var	0.021345
S.E. of regression	0.020836	Akaike info criterion	-4.873826
Sum squared resid	0.081618	Schwarz criterion	-4.772758
Log likelihood	478.7611	F-statistic	2.907266
Durbin-Watson stat	1.785727	Prob(F-statistic)	0.014911

Correlogram of Residuals

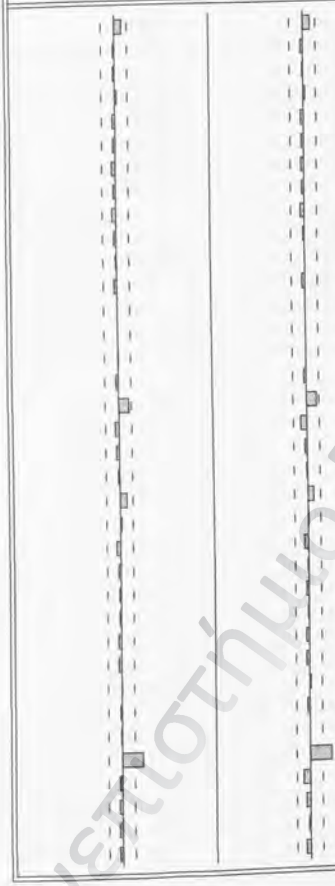
Date: 06/18/02 Time: 12:14
Sample: 1 194
Included observations: 194



	AC	PAC	Q-Stat	Prob
1	0.105	0.105	2.1834	0.140
2	-0.059	-0.071	2.8677	0.238
3	0.169	0.186	8.5628	0.036
4	-0.061	-0.113	9.3024	0.054
5	0.035	0.090	9.5446	0.089
6	0.093	0.031	11.312	0.079
7	-0.002	0.024	11.314	0.126
8	-0.012	-0.034	11.344	0.183
9	0.011	0.005	11.368	0.251
10	0.096	0.104	13.290	0.208
11	0.085	0.062	14.803	0.192
12	-0.014	-0.027	14.843	0.250
13	0.136	0.133	18.752	0.131
14	0.090	0.045	20.457	0.116
15	-0.062	-0.048	21.271	0.128
16	-0.086	-0.145	22.856	0.118
17	-0.012	0.003	22.889	0.153
18	-0.073	-0.075	24.050	0.153
19	-0.027	-0.003	24.204	0.188
20	0.035	-0.007	24.480	0.222
21	0.003	0.040	24.482	0.270
22	-0.105	-0.112	26.937	0.214
23	-0.008	0.001	26.951	0.258
24	-0.019	-0.079	27.033	0.303
25	-0.105	-0.051	29.494	0.244
26	-0.017	-0.025	29.556	0.286
27	0.019	0.040	29.636	0.331
28	-0.043	-0.001	30.058	0.360
29	0.066	0.147	31.069	0.362
30	-0.103	-0.153	33.512	0.301
31	0.087	0.220	35.293	0.272
32	0.171	0.076	42.129	0.109
33	0.009	0.098	42.146	0.132
34	0.046	-0.065	42.654	0.147
35	-0.091	-0.050	44.633	0.128
36	-0.118	-0.086	47.999	0.087

Correlogram of Residuals Squared

Date: 06/18/02 Time: 12:15
Sample: 1 194
Included observations: 194



	AC	PAC	Q-Stat	Prob
1	0.086	0.086	1.4654	0.226
2	-0.010	-0.018	1.4862	0.476
3	-0.010	-0.007	1.5049	0.681
4	0.028	0.029	1.6604	0.798
5	-0.027	-0.033	1.8069	0.875
6	-0.023	-0.017	1.9140	0.927
7	-0.035	-0.032	2.1701	0.950
8	-0.020	-0.016	2.2532	0.972
9	-0.038	-0.035	2.5481	0.980
10	-0.021	-0.016	2.6374	0.989
11	0.000	0.002	2.6374	0.995
12	-0.025	-0.028	2.7682	0.997
13	0.002	0.006	2.7689	0.999
14	0.008	0.003	2.7810	0.999
15	0.012	0.007	2.8103	1.000
16	-0.016	-0.020	2.8679	1.000
17	0.119	0.120	5.9031	0.994
18	-0.036	-0.061	6.1795	0.995
19	-0.031	-0.023	6.3923	0.997
20	-0.015	-0.007	6.4399	0.998
21	0.074	0.067	7.6432	0.996
22	0.020	0.015	7.7336	0.998
23	-0.037	-0.037	8.0398	0.998
24	-0.017	-0.003	8.1051	0.999
25	-0.013	-0.019	8.1447	0.999
26	-0.016	-0.007	8.2045	1.000
27	-0.031	-0.025	8.4186	1.000
28	-0.027	-0.025	8.5811	1.000
29	0.012	0.023	8.6134	1.000
30	-0.014	-0.019	8.6565	1.000
31	-0.001	0.002	8.6568	1.000
32	0.236	0.238	21.722	0.915
33	-0.023	-0.069	21.845	0.931
34	-0.032	-0.040	22.092	0.942
35	-0.026	-0.010	22.249	0.953
36	-0.030	-0.045	22.472	0.962

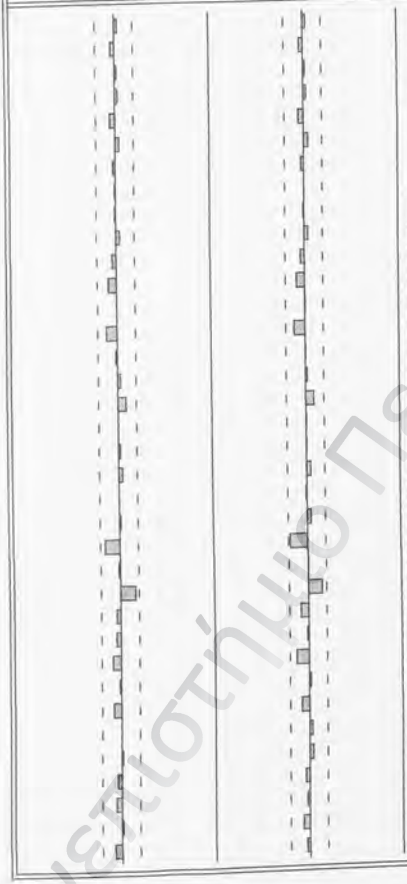
Dependent Variable: RIV_CAR
Method: Least Squares
Date: 06/18/02 Time: 12:18
Sample(adjusted): 1 95
Included observations: 95 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008797	0.021562	-0.407981	0.6843
TAR_CAR	0.069653	0.038345	1.816494	0.0726
DEAL_VALUE	0.005106	0.002194	2.326819	0.0222
RIV_SIZE	-0.002262	0.002522	-0.896890	0.3722
RIV_PERF	-0.008385	0.008296	-1.010641	0.3149

R-squared	0.110590	Mean dependent var	0.010008
Adjusted R-squared	0.071061	S.D. dependent var	0.028739
S.E. of regression	0.027699	Akaike info criterion	-4.283674
Sum squared resid	0.069049	Schwarz criterion	-4.149259
Log likelihood	208.4745	F-statistic	2.797666
Durbin-Watson stat	1.921773	Prob(F-statistic)	0.030623

Correlogram of Residuals

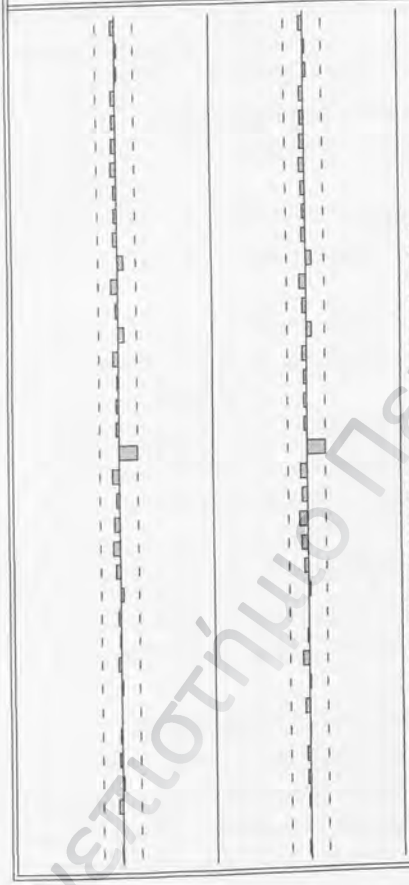
Date: 06/18/02 Time: 12:21
Sample: 1 95
Included observations: 95



	AC	PAC	Q-Stat	Prob
1	0.035	0.035	0.1213	0.728
2	-0.036	-0.038	0.2528	0.881
3	0.029	0.032	0.3399	0.952
4	0.041	0.037	0.5091	0.973
5	-0.052	-0.053	0.7861	0.978
6	0.049	0.055	1.0357	0.984
7	-0.019	-0.030	1.0748	0.994
8	-0.003	0.005	1.0754	0.998
9	-0.003	-0.003	1.0763	0.999
10	0.049	0.044	1.3365	0.999
11	-0.038	-0.035	1.4973	1.000
12	-0.086	-0.086	2.3270	0.999
13	0.007	0.012	2.3322	0.999
14	-0.108	-0.121	3.6545	0.997
15	-0.012	0.012	3.6719	0.999
16	0.036	0.026	3.8246	0.999
17	0.092	0.095	4.8210	0.998
18	0.002	0.015	4.8217	0.999
19	0.025	0.014	4.8990	1.000
20	0.046	0.050	5.1562	1.000
21	0.007	-0.006	5.1624	1.000
22	0.023	0.042	5.2288	1.000
23	-0.153	-0.186	8.2171	0.998
24	-0.011	0.014	8.2324	0.999
25	0.169	0.159	12.007	0.987
26	-0.033	-0.075	12.157	0.990
27	-0.048	-0.016	12.475	0.992
28	-0.086	-0.133	13.487	0.990
29	-0.014	0.028	13.514	0.994
30	-0.076	-0.078	14.340	0.993
31	0.007	0.035	14.347	0.995
32	0.021	0.045	14.415	0.997
33	-0.037	-0.041	14.623	0.998
34	-0.050	-0.019	15.006	0.998
35	0.021	-0.063	15.073	0.999
36	-0.067	-0.028	15.765	0.999

Correlogram of Residuals Squared

Date: 06/18/02 Time: 12:21
Sample: 1 95
Included observations: 95



	AC	PAC	Q-Stat	Prob
1	-0.036	-0.036	0.1244	0.724
2	0.031	0.029	0.2176	0.897
3	0.032	0.035	0.3230	0.956
4	-0.041	-0.039	0.4895	0.975
5	-0.034	-0.039	0.6080	0.988
6	-0.041	-0.043	0.7853	0.992
7	-0.056	-0.055	1.1172	0.993
8	-0.032	-0.034	1.2290	0.996
9	-0.025	-0.025	1.2963	0.998
10	-0.037	-0.039	1.4482	0.999
11	0.072	0.066	2.0186	0.998
12	-0.066	-0.067	2.5049	0.998
13	-0.023	-0.040	2.5664	0.999
14	0.072	0.059	3.1497	0.999
15	-0.055	-0.049	3.4975	0.999
16	-0.016	-0.030	3.5282	1.000
17	-0.022	-0.032	3.5842	1.000
18	-0.032	-0.029	3.7045	1.000
19	0.206	0.207	8.8494	0.976
20	-0.073	-0.067	9.4996	0.976
21	-0.032	-0.053	9.6253	0.983
22	-0.055	-0.086	10.006	0.986
23	-0.070	-0.059	10.628	0.987
24	-0.047	-0.037	10.911	0.990
25	0.036	0.030	11.084	0.993
26	-0.020	0.004	11.139	0.995
27	-0.007	-0.012	11.145	0.997
28	-0.028	-0.060	11.256	0.998
29	0.022	0.020	11.326	0.999
30	0.006	-0.045	11.331	0.999
31	-0.013	0.009	11.357	1.000
32	-0.023	-0.032	11.434	1.000
33	0.021	-0.020	11.499	1.000
34	-0.034	-0.016	11.675	1.000
35	0.008	0.008	11.685	1.000
36	-0.004	-0.011	11.688	1.000

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