

Resumen

El objetivo de este trabajo es el de identificar los factores principales que impactan en la creación de valor en una fusión de entidades financieras, para los accionistas de la empresa objetivo y/o del licitador.

Para alcanzar el objetivo del trabajo, hemos estudiado 218 fusiones entre empresas del sector financiero de todo el mundo. Comprobamos la relevancia de 47 posibles factores, seleccionados según estudios anteriores. Estos factores pueden ser divididos en cuatro categorías generales.

El primero incluye las variables que representan las características macro económicas, culturales, fiscales y políticas de los países de las compañías implicadas. El segundo incorpora variables que analizan las diferencias entre los dos países, por ejemplo sistemas fiscales, financieros o políticos. El tercero incluye las características técnicas de la operación, como el porcentaje del efectivo pagado. El cuarto incluye varias características de las dos compañías, como la eficacia relativa, el beneficio, el índice de crecimiento, el potencial para la reducción de diversos tipos de riesgo, el potencial para las economías de alcance y de escala.

Para analizar la importancia y los efectos de estas variables, utilizamos diferentes análisis, como las regresiones lineales múltiples, el análisis factorial, el análisis estático y el análisis discriminatorio. Los resultados estadísticos para comprobar la calidad de los modelos nos muestran unos resultados óptimos. Descubrimos que las entidades objetivo muestran, a los 10 días después del anuncio, un crecimiento medio del 14.18% superior al original, mientras que hay una pérdida del valor bursátil del 2.24% por los licitadores y que no se crea ningún valor significativo en el conjunto de las dos empresas.

Pero el hecho interesante es que hay algunas variables que impactan de manera relevante en el éxito de la fusiones. La calidad y la transparencia del sistema legislativo del país al que pertenece la empresa objetivo, es crucial para ambas compañías. Particularmente la transparencia del banco central desempeña un papel importante. Un sistema legal y financiero claramente regulado es un factor determinante para el éxito del licitador. Además, las operaciones exitosas ocurren entre entidades cuyos países sean desarrollados y estables , con un sector financiero en crecimiento . La empresa objetivo debe ser relativamente pequeña, rentable, pero menos eficiente que el licitador e infravalorada por la bolsa. La diversificación geográfica puede tener un impacto positivo cuando las diferencias están en el sistema legal, pero cuando los dos países son cultural o políticamente diferentes, probablemente el reparto fallará. La diversificación del producto no aporta valor, mientras que la baja relación en la cotización de las acciones de las dos empresas permite un mayor creación de valor.





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1 Introduction

Mergers and acquisitions within the worldwide financial sector have changed the banking landscape all over the world. In the last decade a process of concentration occurred before in The United States and later in Europe. In Europe the market concentration measured by the market share of the top 5 banks in term of total assets grew by 12% over the last 10 years to 57,1% in 1999 (Beitel 2003).

According to several studies a general tendency of growth will occur in the next few years. Financial institutions no longer compete with local players in the domestic market, but potentially worldwide. The further growth of across border banking can help financial institutions find out new solutions to survive and boost their market share. M&As respond to these needs. Therefore many deals are expected to occur in the next few years, both across borders and across industries, generating the so called “bankinsurances”.

From this new landscape some crucial questions emerge. *Which markets should a CEO of a large bank target? Which characteristics should the two financial institutions have to create value for the bidder's shareholders? Which types of targets benefit from higher excess returns for their shareholders? Which kinds of deals create value from a combined point of view?* It is our endeavour to give empirical based answers to these and other questions.

In chapter two a general overview of the worldwide financial industry is provided, together with some possible future scenarios. In chapter three we examine the previous literature to identify the main drivers of success for target, bidder and the combined entity, while in the following chapter we illustrate the main statistic tools we utilize for our analysis. Chapter five provides a general description of the dataset and of the descriptive statistics. Finally in chapter six the main results achieved are given.



2 Overview of the worldwide financial sector

The financial sector has been rapidly changed in the last few decades. A process of deregulation, the development of new technologies and an integration between geographic areas, have boosted a process of concentration, that has been characterizing before in the United States and later in Europe.

Financial institutions no longer compete with local player in domestic market but potentially worldwide, with each other and with all the other financial institutions of different areas. Several areas are characterized by a high concentration of financial institutions and are overfilled, while others are underserved; some markets are characterized by a high propensity of saving, and in others the propensity of spending is dominating the scene. All those factors generate a new scenery where the competition is getting always tougher.

In this context banks have to find out new solutions to survive and gain market share and power. M&As respond to those needs.

This chapter is mainly divided in four parts. In the first one we start giving a general overview of the financial sector and M&A activities in the last few years; in the second section we focus on the US situation and in the last one the European market is analyzed. To conclude, in the last section we briefly analyse the future scenarios



2.1 Financial industry worldwide picture

2.1.1 Border of our the analysis

The ongoing consolidation of financial institutions is one of the most notable contemporary features of the financial landscape both within and across many industrial countries.

Consolidation may result from combinations of existing firms, growth among leading firms, or industry exit of weaker institutions. There are several alternatives for firms combining with each other. In our work we focus on mergers, in which two formerly independent firms become commonly controlled. The distinction between a merger and an acquisition is somewhat vague.

A merger is often defined as a transaction where one entity is combined with another so that at least one initial entity loses its distinct identity. Thus, full integration of the two firms takes place and control over a single entity can easily be exercised.

In the next section we gave a general overview of the current situation and then we explain briefly which factors contributed to the development of M&A activities.

2.1.2 General overview

The financial services sector is being transformed by ongoing fundamental change. Most of the leading corporations in the world today are the products of mergers undertaken in the last few years.

We can just for example look inside our market and think about Italian banks such as Unicredit or bank Intesa, to notice how their current assets and structures have changed in the last few years.

Regardless of the differences in the current pace of restructuring across countries, the pressure for change has been increasing in virtually most of the countries. A fairly rapid and, in some cases, accelerating consolidation of the banking sectors in several countries (e.g. the Netherlands, the United Kingdom, and the United States) has been underway for some years,



while in other countries (e.g. France, Germany, Italy, Switzerland, and Japan) the pace of restructuring has clearly picked up more recently.

Although the forces creating pressure for change are similar throughout most of the world, variations in the degree and nature of regulatory and supervisory regimes of the financial sectors in different countries have resulted in some disparities in the responses to this pressure. Nonetheless, it is possible to identify three broad trends that have emerged:

- 1) consolidation within subgroups of the financial services sector (i.e. two commercial banks merge);
- 2) convergence among different types of service providers (i.e. banks, insurance companies, and securities dealers);
- 3) increasing competition across different types of service providers and, across institutions serving different national markets.

As consequence, in the past year or so, a number of high-profile linkages have been forged among banks, securities dealers, and insurance companies and several other well-publicised mergers are now in the works. These combinations have occurred both within national markets and (less frequently) on a cross-border basis, and have come in a variety of forms, including:

- 1) mergers of smaller institutions by larger domestic acquirers;
- 2) mergers of large institutions by larger, more profitable domestic acquirers;
- 3) domestic mergers of equals.

Increasingly, M&As are being used as part of an overall strategy that entails decisions about the total product mix the institution will offer, the services that are to be provided in-house and those that are to be out-sourced, as well as the geographic area in which the institution wishes to compete.



2.1.3 External factors contributing to M&A activities

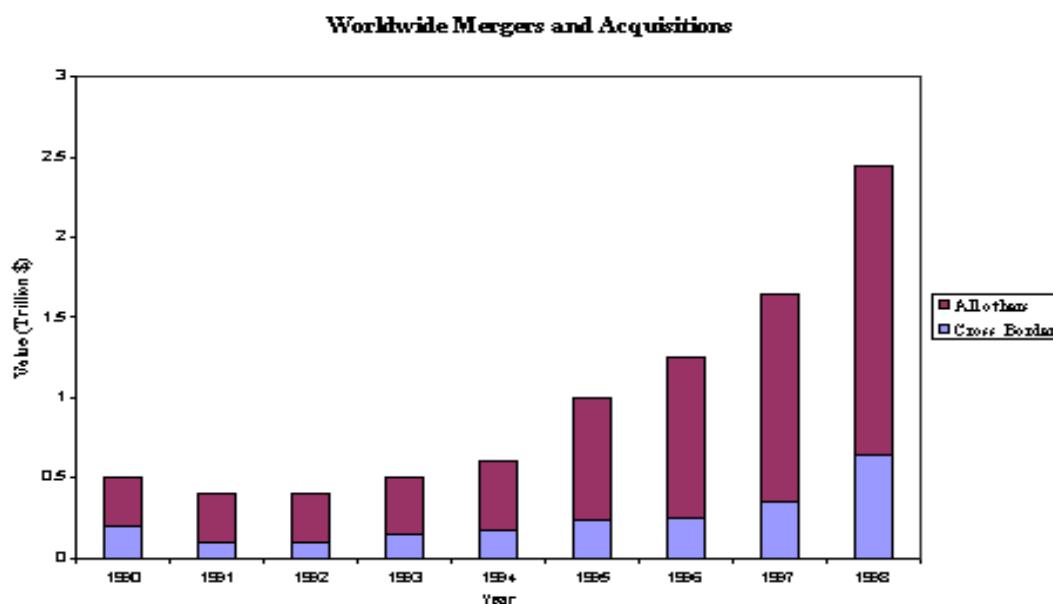
As we have already said, the last decade saw a rapid expansion in total M&A transaction number and that growth was accompanied by an increase in the estimated size of the average transaction. In particular in the last three years of the millennium, there was a dramatic rise in the number of and value associated with large M&A deals.

This pattern is advisable from the table 2-1, which reports the annual number and aggregate value of mergers and acquisitions that involved a financial firm in one of the biggest countries¹ as the target and that had a reported value of at least USD 1 billion.

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
number	8	10	6	11	14	23	21	49	58	46
Value	26.5	22.1	12.4	39.7	23.7	113.0	59.0	233.0	431.0	291.0

table 2-1 ,Financial sector mergers and acquisitions with value greater than USD 1 billion, source:
Thomson financial

A further significant characteristic of this merger wave is the increasing large incidence of cross border takeovers and mergers. (see graph 2-1)



graph 2-1 , Worldwide Mergers and Acquisitions, source: Economist, January 1999

¹ In this analysis done by Thomson Financial, they consider 13 countries: US, Canada, Japan, Australia, Belgium, France, Germany, Italy, Netherlands, Spain, Sweden, Switzerland, United Kingdom



All countries												
All values in USD millions												
Deals classified by country and sector of target firm												
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Dealtypes												
Within border/ within industry	Number	213	403	473	532	583	605	602	635	620	594	5260
	Total value	17762.5	32606.4	31340.5	53605.7	43621.0	127777.9	73039.3	221869.8	354225.2	271276.8	1227125.1
	Avg value	158.6	174.4	141.2	169.1	114.5	350.1	202.3	514.8	803.2	788.6	388.2
Within border/ cross industry	Number	53	78	83	90	112	135	140	147	121	172	1131
	Total value	12195.8	4299.0	3604.7	6125.6	3679.8	8859.5	7114.3	36203.0	107903.6	21957.2	214200.5
	Avg value	396.6	125.7	94.9	113.4	62.4	142.9	99.6	444.2	1332.1	196.0	340.0
Cross- border/ within industry	Number	39	45	44	46	59	87	75	87	96	90	668
	Total value	6407.0	812.5	1291.5	5008.0	5074.9	11629.4	13353.2	25714.2	24975.5	48661.4	142927.6
	Avg value	400.4	67.7	86.1	263.6	169.2	290.7	381.5	547.1	480.3	1013.8	455.2
Cross- border/ cross industry	Number	19	23	16	14	19	29	25	32	37	31	245
	Total value	1536.4	382.0	2122.6	542.8	1027.3	3342.3	3410.0	7187.3	8011.5	11275.5	38837.7
	Avg value	192.1	42.4	235.8	90.5	114.1	222.8	284.2	378.3	320.5	393.4	296.5
Dealtypes												
Within border	Number	266	481	556	622	695	740	742	782	741	766	6391
	Total value	30058.3	32005.4	34945.2	59731.3	47300.8	136635.4	80213.6	260072.8	462128.8	293234.0	1441325.6
	Avg value	210.2	166.7	134.4	161.0	107.5	320.0	185.3	503.0	885.3	643.1	380.2
Cross- border	Number	58	68	60	60	78	116	100	119	133	121	913
	Total value	7943.4	1194.5	3414.1	5550.8	6102.2	14971.7	16763.2	32901.5	32987.0	59936.9	181765.3
	Avg value	331.0	56.9	142.3	222.0	156.5	272.2	356.7	498.5	428.4	894.6	408.5
Dealtypes												
Within industry	Number	252	448	517	578	642	692	677	722	716	684	5928
	Total value	24169.5	33418.9	32632.0	58613.7	48695.9	139407.3	86392.5	247584.0	379200.7	31938.2	1370052.7
	Avg value	188.8	167.9	137.7	174.4	118.5	344.2	218.2	518.0	769.2	816.2	394.3
Cross- industry	Number	72	101	99	104	131	164	165	179	158	203	1376
	Total value	13832.2	4781.0	5727.3	6668.4	4707.1	12199.8	10584.3	45390.3	115915.1	33232.7	253038.2
	Avg value	354.7	108.7	121.9	111.1	69.2	158.4	126.0	432.3	1093.5	233.7	332.5
Industry												
Banking	Number	199	311	381	461	525	532	480	534	533	488	4444
	Total value	31041.2	31533.2	26653.4	29707.3	34556.7	136241.4	46370.9	187074.1	373030.6	270277.9	1166488.7
	Avg value	250.3	193.5	131.9	98.4	95.2	404.3	149.6	482.1	921.1	826.5	399.3
Insurance	Number	54	89	102	87	80	123	149	145	146	103	1078
	Total value	5029.5	3009.9	9003.8	16945.7	11499.1	6968.9	32966.7	55064.5	89270.8	44506.5	274675.4
	Avg value	210.0	106.6	191.6	434.5	267.4	131.5	439.6	724.5	1115.9	927.2	531.3
Securities/ Other	Number	71	149	133	134	168	201	213	222	195	296	1782
	Total value	1921.0	3254.8	2702.1	18629.1	2347.2	8396.8	17639.2	50835.7	32814.4	38386.5	181926.8
	Avg value	101.1	67.8	77.2	338.7	100.6	91.3	185.7	427.2	287.8	259.4	228.0
Total	Number	324	549	616	682	773	856	842	901	874	887	7304
	Total value	38001.7	38199.9	38359.3	65282.1	53403.0	151607.1	96976.8	292974.3	495115.8	353170.9	1623090.9
	Avg value	227.6	157.2	135.1	164.9	111.5	314.5	202.0	502.5	826.6	675.3	383.2
GDP												
Value/GDP												
0.24%												
0.22%												
0.21%												
0.35%												
0.27%												
0.20%												
0.45%												
1.38%												
2.30%												
1.57%												
0.82%												

table 2-2, financial deals 1990-1999, source: Federal Reserve, 2001



In this section we start giving a general picture of the main factors that contributed to this consolidation process and then we briefly present the main factors that can obstacle it. In the following section we will analyze in a more detail level these factors in the US and European market.

2.1.3.1 Environmental factors encouraging consolidation

Improvements in information technology

- New technological developments have encouraged consolidation because of their high fixed costs and the need to spread these costs across a large customer base. At the same time, dramatic improvements in the speed and quality of communications and information processing have made it possible for financial service providers to offer a broader set of products and services to larger numbers of clients over wider geographic areas than had been feasible in the past.

Deregulation

- Over the past 20 years, many governments have removed important legal and regulatory barriers to financial industry consolidation. The removal of these barriers has opened the way for increased M&As, both within and across national boundaries and both within and across financial industry segments.

Globalisation

- Globalisation is, in many respects, a by-product of technological change and deregulation. Its influence as a factor encouraging consolidation has been strongest among firms engaged in the provision of wholesale financial services, highlighting the importance of the expansion of capital markets. As non-financial firms expand the geographic scope of their operations, they expect their financial service providers to be able to meet their changing needs, which may also encourage consolidation.

Shareholder pressures

- Increased competition has helped to squeeze profit margins, resulting in shareholder pressure to improve performance. Importantly, shareholders have gained power



relative to other stakeholders in recent years. This development is expected to continue, as it is the result of a structural move towards the globalisation of savings.

- The interplay of all of these factors has put increased pressure on financial institutions to improve profitability. Consolidation has in many cases seemed an attractive way to accomplish this objective.

The euro

- Although the impact of the euro on financial sector consolidation in Europe is still difficult to assess, there are reasons to believe that the euro is stimulating consolidation in Europe. These reasons relate primarily to the euro-induced changes in financial markets in Europe, which provide new opportunities for realising economies of scale and revenue enhancement through consolidation. In fact thanks to the introduction of euro, some costs (exchange costs..) were eliminated and further, the introduction of a unique currency, reduced the risk of instability of the member states and improved the opinion of foreign countries towards the European members (before the single currency could be devaluated and this was risky for outside investor).

Economic situation

- Overall the last decade of the millennium was characterized by a general positive economic situation that contributed to raise the enthusiasm of the manager to undertake operation aimed to the growth in a prosperous market.

2.1.3.2 Environmental factors discouraging consolidation

There are two main key factors that continue to discourage financial consolidation: regulation and cultural differences.

Regulation

- Deregulation has played an important role in encouraging consolidation among financial service providers over the past two decades. However, remaining legal and regulatory restrictions (e.g. competition policies and policies limiting foreign ownership of financial institutions) and differences in regulations across countries



(e.g. capital standards) continue to discourage some types of consolidations, especially those that involve cross-border activity.

Cultural differences

- Cultural differences, which include different corporate cultures and corporate governance regimes, as well as differences in language or national customs, appear to be important impediments to consolidation, especially on the cross-border and cross-product levels.

Regulation and cultural differences can have particularly strong deterrent effects on hostile takeovers of financial institutions. In addition, the existence of strong information asymmetries between potential acquirers and potential targets in appraising illiquid financial assets probably discourages hostile takeovers.



2.2 Different features among countries

Even though some general models are evident on a global level, a number of differences in the patterns of M&A activity in various countries exist. Just to make an example, the relative importance of M&A activity, as measured by total deal value over the decade divided by GDP over the period, differed substantially across countries.

In Germany, Japan and Canada, this measure was less than 0.5%, whereas in Switzerland, Belgium, the United States and the United Kingdom, it exceeded 1% regardless of whether deals are classified by target or acquirer (Federal Reserve (2001)).

Countries also differed in the extent to which their firms engaged in international mergers. In the United States and Japan, almost all deals involved two firms from the home country. In contrast, small countries are generally more open. Just to make an example when one of the firms was located in Belgium, half of all deals, accounting for about 40% of all value, involved an international transaction.

In this section who focus on the United States and European market underlying the similarity and differences.



2.2.1 M&A situation in USA

2.2.1.1 *Introduction*

The financial industry constitutes a major part of the U.S. economy. This sector is mainly dominated by commercial banks, insurance companies, and mutual funds. Throughout the last three decades, and particularly in the nineties, the industry has undergone several changes in both its structure and regulation.

In particular regulatory restrictions affecting the ability of banks to diversify geographically and the range of products offered have decreased dramatically.

As consequence consolidation of all types of business activities has been a prominent feature of the economic landscape for at least the past decade: the last few years have witnessed an acceleration of consolidation among financial institutions.

Further in this process the markets became increasingly internationalized, as deregulation allowed foreign-owned banks to extend their operations. United States represent a precursor of the merger process that is now characterizing Europe.

In the next sections we are going to give an overview of the Financial industry in the United States.



2.2.1.2 Historical overview

1985-2000

At the beginning of the 90 the structure of banking industries appeared very unconcentrated in the United States. Subsequently, a high level of merger and acquisition activity occurred among financial firms. In this section we are going to analyse the US situation in the period comprise between 1985 and 2000, explicating which factors impacted and facilitated the consolidation process.

Important changes were introduced by the modification to Regulation Q that took place during the 1980s and paved the way for the favourable economic climate in the banking industries. Regulation Q that, among other things, capped the interest rates commercial banks could offer on savings account deposits, in hopes of protecting banks from failure by reducing the need for them to acquire high yielding, risky assets in order to finance high interest rates on deposits.

Further the intent was to prevent bidding wars between banks trying to grow their depositor bases. Now thanks to the repel of the Regulation Q, the banks could, first, compete for deposits among themselves and other quasi-banks and related institutions; second, the changes allowed banks to counter the disintermediation problem, which manifested itself in situations where consumers withdrew cash deposit from banks and invested these funds directly in various financial products, thereby attracting higher returns on their investments (Ashford Maharaj, (2001)).

Even though the regulation Q had important and positive effect on the US economy, overall after the big depression, his repel was a necessary condition for the banking industries to seriously afford the growth and value maximisations that can be generated directly from bank mergers and acquisitions.

Further prior to 1994 the banking system was highly fragmented; national banks were not allowed to establish branches at will, as they were subject to the banking laws of each state. Within states, local banks faced similar restraints on their branching activities. In 1988, only 22 states permitted state-wide banking of national banks, while 18 allowed limited banking and ten permitted no branches. Consequently in 1988 over 60% of US commercial banks had assets of less the \$150 million, while only 3% had assets valued at \$500 million or more.



The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 removed most of the barriers to interstate bank acquisitions and interstate banking. The new act allowed banks to merge with banks in other states although they must operate them as separate banks. In addition, banks are allowed to establish branches in neighbouring states. Restrictions on branching activity were lifted as well on June 1997. The legislation allowed banks to lessen their exposure to regional economic downturns. It also ensured a continuing stream of bank mergers.

Thanks to this new change, during the decade, approximately 7,500 transactions, valued at roughly \$1.6 trillion, were consummated. The number of commercial banks has decreased by the thousands, reaching around 8,000 in 1999 from over 11,000 a decade earlier, and most of the banks exiting have been small². The number of mergers has averaged around 400 per year throughout the nineties³. The industry has increased to over 65,000 branches and 190,000 automated teller machines.

Characteristics of the operations

The United States accounted for about 55 percent of M&A activity, partly because of their historically large number of relatively small financial firms, even if, it is also true that many very large U.S. banking institutions expanded their geographic presence by acquiring other very large banks, especially later in the decade. Most of the last decade's merger and acquisition activity in the financial sector involved banking organizations. Acquisitions of banking firms accounted for 60 percent of all financial mergers and 70 percent of the value of those mergers in the nations studied.

In addition, most M&A transactions involved firms competing in the same segment of the financial services industry within the same country, while domestic mergers involving firms in different segments of the overall financial services industry were the second most common type of transaction (Federal Reserve (2001)).

During these fifteen years there was an important change in the size of deals. In fact if the average deal value was under USD 150 million for the period up to 1994 it jumped to USD 500 million between 1995 and 1999 and transaction value was especially large at the end of the decade, averaging about USD 800 million over the last two years.

² A small-sized bank is defined here to have assets below \$100 million.

³ Based on data from the Federal Reserve Board on mergers and acquisitions.



As a consequence, the distribution of bank size has changed. In fact, in the last years acquisitions have generally taken place through bank holding companies, which then fall under the jurisdiction of the Federal Reserve System. This has allowed banks to extend their business into non-bank activities such as insurance, financial planning, and mortgages, as well as opening up geographical markets. The number of such holding companies is estimated at 6,500. These companies are believed to control over 90% of total bank assets. While the big bank⁴ share of assets has increased to almost 30 percent that of small banks has decreased to less than 5 percent. Based on accounting rates of return, profit margins are also high, and have been consistently at high levels throughout the nineties.

As we have already said, in this period most of this operation were domestic, and in particular were played by US financial institutions operating in the same geographical area. The prevalence of same-country, same-industry activity may reflect regulatory constraints in some countries prohibiting cross-border and cross-industry mergers. The limited number of cross border deals was mainly due to diverse domestic regulatory regimes, corporate and national cultural differences and indeed to a higher risk involved in the operation, even if, cross-border activity was relatively strong at insurance companies and in joint ventures and strategic alliances outside the United States (Federal Reserve (2001)).

However such as domestic merger deals , as well acquisitions of US financial firms by foreign, same-industry firms increased in the late 1990s, as three quarters of the overall deal value associated with such acquisitions arose between 1997 and 1999.

Likewise, US firms also increased the rate at which they purchased foreign firms that operated in their own industry. Of special note, firms headquartered in the United States made foreign acquisitions more frequently than their foreign counterparts made US acquisitions, but the size of the purchases made by US firms was smaller. During the decade, acquisitions of foreign firms by US firms had an estimated average value (roughly USD 300 million) which was less than half the value of acquisitions by foreign firms of US firms (roughly USD 800 million), suggesting that foreign firms may have been more focused on larger, more mature firms.

⁴ big banks are defined to have assets over \$100 billion. Despite the large number of banks in the U.S., the ten largest banks hold almost a third of national deposits.



Cross-border, cross-industry deals were rare in the 1990s, but many of the deals of this type involved US firms in the securities/other industry, as either acquirer or target. US banks were also not uncommon targets of such deals (Federal Reserve (2001)).

One of the most important conclusions is that financial consolidation has helped to create a significant number of large, and in some cases increasingly complex, financial institutions. In addition, these firms increasingly operate across national borders and are subject to a wide range of regulatory regimes.

Merger and acquisition activity in the banking sector¹

	Number of transactions				Value of transactions							
					In billions of US dollars				As a % of all sectors ²			
	1991-92	1993-94	1995-96	1997-98 ³	1991-92	1993-94	1995-96	1997-98 ³	1991-92	1993-94	1995-96	1997-98 ³
United States	1 354	1 477	1 803	1 052	56.8	55.3	114.9	362.4	18.7	9.0	10.6	18.2
Japan	22	8	14	28	0.0	22	34.0	1.1	0.3	18.8	21.6	4.1
Euro area ⁴	495	350	241	203	17.5	14.6	19.1	100.4	8.3	9.3	11.2	27.1
Belgium	22	18	20	21	1.0	0.6	0.5	32.5	14.1	7.0	4.9	34.8
Finland	51	16	7	7	0.9	1.0	1.2	4.3	22.3	21.7	7.4	77.5
France	133	71	50	36	2.4	0.5	6.5	4.0	4.3	1.0	9.8	4.1
Germany	71	83	36	45	3.5	1.9	1.0	23.2	6.5	7.6	3.7	45.5
Italy	122	105	93	55	5.3	6.1	5.3	30.1	15.6	17.7	24.9	63.3
Netherlands	20	13	8	9	0.1	0.1	2.2	0.4	0.2	0.5	17.5	0.8
Spain	76	44	27	30	4.3	4.5	2.3	5.9	13.5	21.5	14.1	26.6
Norway	23	24	9	5	0.1	0.2	1.0	1.5	1.2	5.7	8.0	20.0
Sweden	38	23	8	8	1.1	0.4	0.1	2.1	3.8	2.0	0.3	7.1
Switzerland	47	59	28	22	0.4	3.9	1.0	24.3	9.5	43.4	2.4	78.3
United Kingdom	71	40	25	17	7.5	3.3	22.6	11.0	6.5	3.4	10.4	4.0
Australia	19	20	18	14	0.9	1.5	7.3	2.3	3.6	5.7	14.3	4.9
Canada	29	31	16	11	0.5	1.8	0.1	29.1	1.9	4.1	1.6	34.4
Total banks	2 098	2 032	2 162	1 360	84.7	83.2	200.8	534.2	11.7	8.5	11.0	18.9
<i>Total non-bank fin</i>	723	3 267	3 973	5 156	63.7	122.2	189.9	534.2	8.8	12.5	10.4	19.4

Notes: 1) Classified by the industry of the target; only completed or pending deals; announcement date volumes.
 2) Of mergers and acquisitions in all industries. 3) As at 30 October 1998. 4) Excluding Austria, Ireland, Luxembourg and Portugal. Source: BIS, Securities Data Company.

table 2-3, M&A in the banking sector, source: BIS, Security Data company



All North American countries
All values in USD millions
Deals classified by country and sector of target firm

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Deal type												
Within border/within industry												
Number	152	204	293	373	412	453	418	469	435	301	3510	
Total value	4839.7	21792.7	18773.4	29314.2	30706.6	31258.7	44591.6	171470.8	284734.3	76733.3	754215.3	
Avg value	36.9	162.6	103.7	111.5	95.1	230.6	154.8	477.6	818.2	335.1	299.4	
Number	25	28	33	41	47	57	60	76	78	88	533	
Total value	392.2	659.6	2092.7	3675.6	1965.1	5803.8	4196.7	19806.3	87786.8	11889.6	138268.4	
Avg value	15.7	34.7	130.8	141.4	67.8	181.4	119.9	430.6	1567.6	201.5	416.5	
Number	14	11	6	12	11	19	19	21	27	26	166	
Total value	1487.0	291.2	9.8	815.7	1393.8	3974.2	8667.4	9035.8	15401.9	30935.1	72011.9	
Avg value	106.2	58.2	4.9	116.5	154.9	331.2	619.1	645.4	855.7	1933.4	699.1	
Number	9	5	5	2	3	5	4	8	6	9	56	
Total value	49.0	46.5	88.2	25.8	789.7	2244.9	2801.6	2012.2	533.1	3447.3	12040.3	
Avg value	5.4	9.3	17.6	12.9	263.2	748.3	700.4	335.4	106.6	689.5	354.1	
Deal type												
Within border												
Number	177	232	326	414	459	510	478	545	513	389	4043	
Total value	5231.9	22452.3	20866.1	32989.8	32621.7	22062.5	48788.3	191222.1	322521.1	88622.9	892483.7	
Avg value	32.8	146.7	105.9	114.2	92.8	226.0	151.0	472.3	922.1	307.7	313.0	
Number	23	16	11	14	14	24	23	29	33	35	222	
Total value	1536.0	339.7	98.0	841.5	2183.5	6219.1	11469.0	11048.0	15935.0	34382.4	84052.2	
Avg value	62.0	48.5	19.6	105.2	182.0	414.6	637.2	552.4	692.8	1637.3	613.5	
Deal type												
Within industry												
Number	166	215	299	385	423	472	437	490	462	327	3676	
Total value	6326.7	22083.9	18783.2	30129.9	32100.4	75232.9	53259.0	180506.6	300136.2	107668.4	826227.2	
Avg value	39.5	158.9	102.6	111.6	96.7	234.4	176.4	483.9	820.0	439.5	315.1	
Number	34	33	38	43	50	62	64	84	84	97	589	
Total value	441.2	708.1	2180.9	3701.4	2734.8	8048.7	6998.3	21818.5	88319.9	15336.9	150308.7	
Avg value	12.6	33.7	114.8	137.1	86.1	230.0	179.4	419.6	1447.9	239.6	410.7	
Industry												
Banking												
Number	136	164	247	333	369	396	348	397	362	261	3013	
Total value	5153.1	21045.6	15075.4	18784.7	23204.4	73568.7	35076.8	139274.0	300112.2	80384.8	711679.7	
Avg value	38.6	125.4	93.1	74.8	75.6	263.7	134.9	428.5	965.0	370.4	306.4	
Number	26	39	48	39	41	59	74	64	79	50	519	
Total value	1451.8	1262.0	4986.9	6229.6	5792.5	5119.4	14752.4	19364.1	59114.2	23212.9	141340.8	
Avg value	54.1	63.1	172.0	314.0	231.7	142.2	335.3	586.8	1237.7	829.2	480.8	
Number	38	45	42	56	63	79	79	113	105	113	733	
Total value	163.0	484.4	901.8	8767.0	5858.3	4593.5	10428.1	43682.0	29229.7	19402.6	123515.4	
Avg value	4.0	24.2	82.0	337.2	183.1	112.0	281.8	652.0	423.6	303.2	332.9	
Total	200	248	337	428	473	534	501	574	546	424	4265	
Total value	6767.9	22792.0	20964.1	33831.3	34855.2	83281.6	60257.3	202325.1	388456.1	123005.3	976535.9	
Avg value	63.3	142.5	103.8	113.9	95.8	233.9	176.7	476.1	909.7	398.1	326.8	
GDP/GDP	6384403	6582621	6897278	7204432	7616368	7988801	8424152	8935031	9368628	9901033	99302747	
Value/GDP	0.11%	0.35%	0.30%	0.47%	0.46%	1.04%	0.72%	2.26%	4.15%	1.24%	1.23%	

table 2-4, north American deals, source: Federal Reserve, 2001

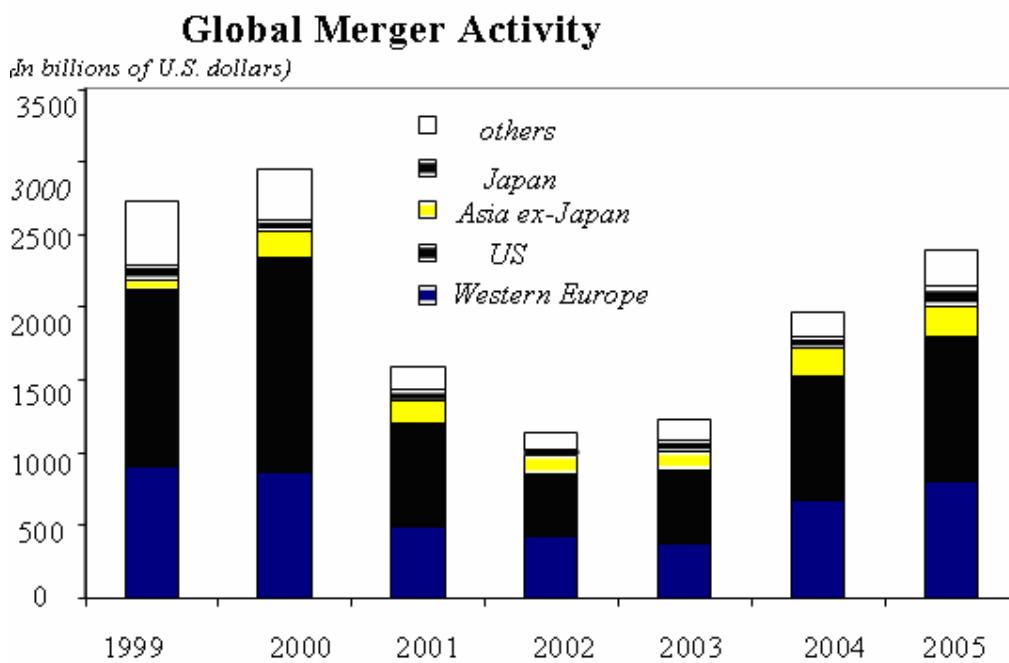


2001-2003

An international crisis characterized this period. After the 11 September of 2001, a huge regression has hit the United States and most of the civilized world. This was an unexpected crisis and most of the financial players were not ready and capable to manage it. (see graph 2-2)

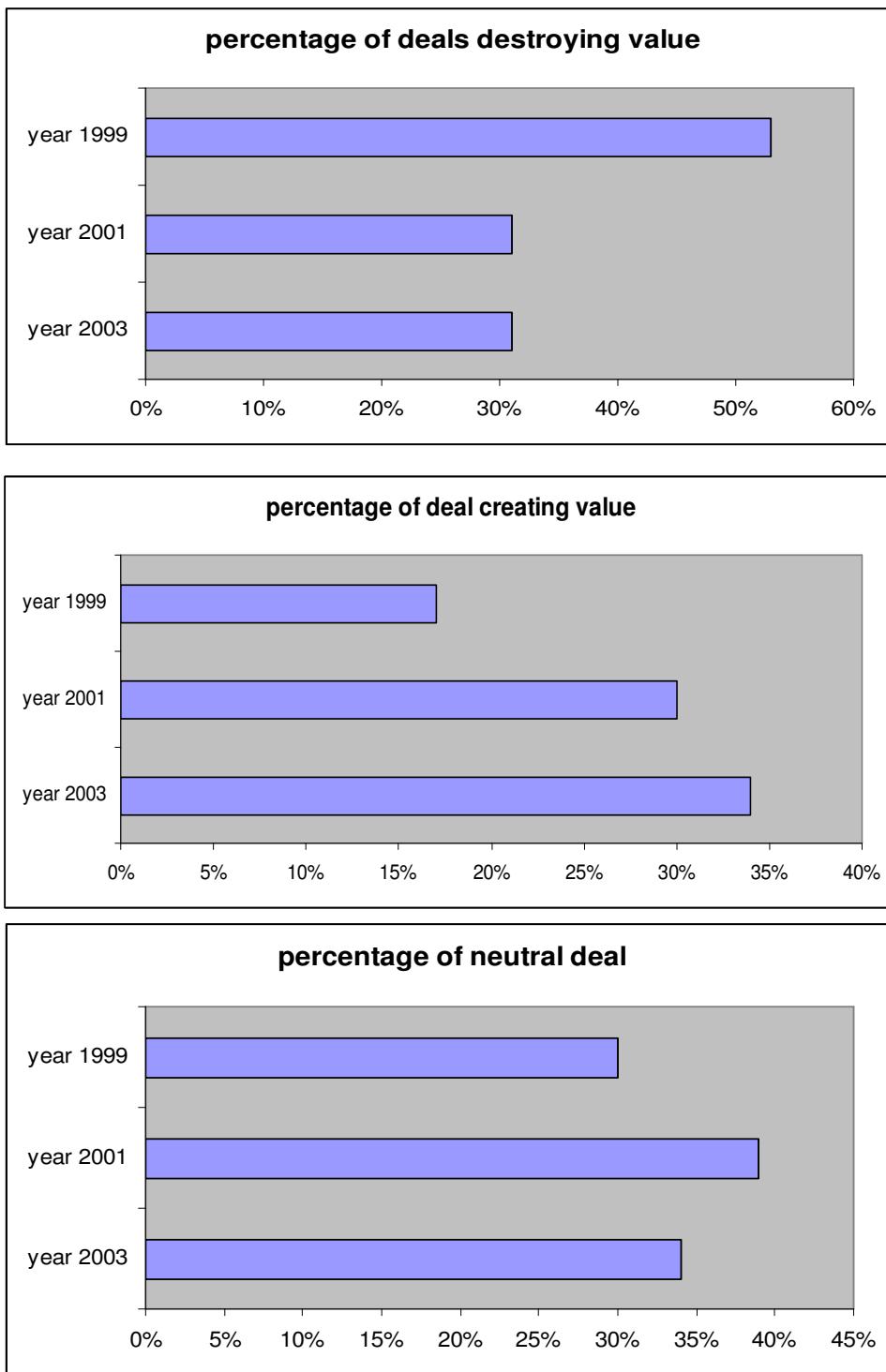
During this period the M&A activities slowed drastically. It was not the right time for expansion, everyone was fighting in order to survive, everyone was focusing and looking inside his own company instead of searching new possible target to buy.

That does not mean that mergers realized in this period destroyed value. That is confirmed by a survey done by KPMG in 2002, that reflecting the general tendency in the last few years, shows how even if the number of M&As fall drastically, the companies that in this period merged over performed their competitors. (see graph 2-3) This survey shows how the deal strategy is acquiring always more importance and this outcome probably could be seen how the management practices are evolving in the last years, contributing to the success of the operation.



graph 2-2, merger activities divided for country, source: Federal reserve





graph 2-3, survey on the value creation, source KPMG international (2003)

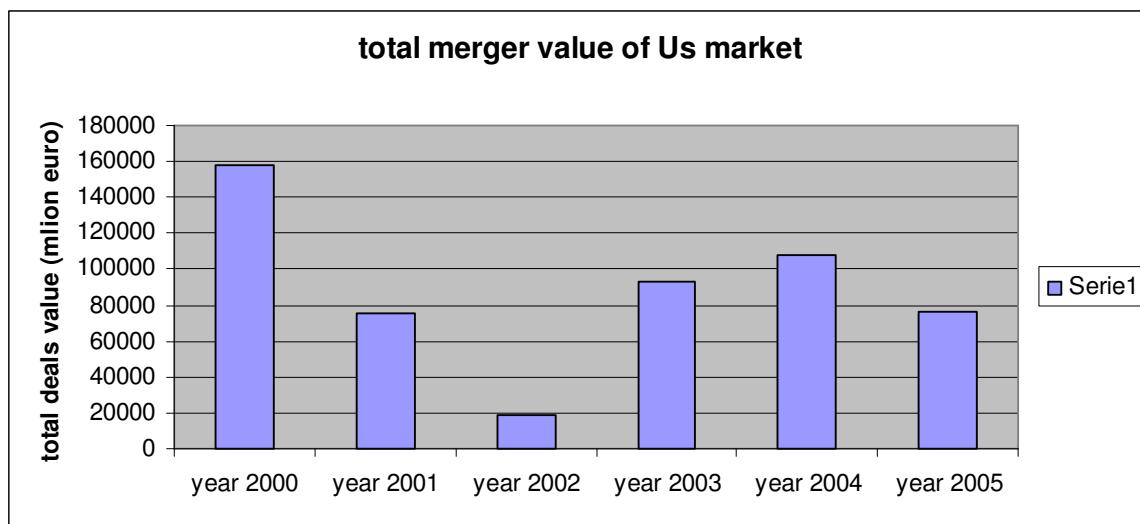


2003-2006

This period seems to be characterized by a new born interest in merger deals. We probably are in front of another shift in the climate for M&A, from the depressed market conditions that have persisted the period between 2001-2002, and to a positive growth that is characterizing the last few years.

In fact how it can seen from the graph 2-4, after the big repression of 2002 we are likely assisting a new wave of consolidation. In fact, even if 2005 has been characterized by a light decreasing in merger activities and even if we haven't reached yet the peak characterizing the 2000 we are quite optimistic in a recovery, and attribute this slight decreasing of 2005 to external macroeconomic factors such as for instance uncertainty linked to the economical and political situation in Iraq, or the prospect of an inflation.

In general the incremental growth of the last 3 years represents a wish for the future of mergers deals. In particular 2004 was the best overall performance for mergers and acquisitions since the record-breaking market of 2000.



graph 2-4, mergers value in the last 6 years, source: elaboration of our data (see chapter 5)



Several factors have combined to drive this new increased M&A activity, such as:

- improved economic conditions
- increased corporate profits
- the return of corporate buyers
- strong debt and equity financing markets
- improved corporate confidence
- growth in the amount of private equity capital chasing investments.

In this general positive economic landscape, sellers have enjoyed higher valuations and greater interest from buyers, while buyers have been able to make investments with the backdrop of a more stable economy, an increasingly accommodating lending market and greater earnings visibility.

If we get a look closer to the M&A operations, we can notice how strategic buyer activity in the middle market⁵ segment was the major driver in the last few years (Trenwith Group, (2005)). While strategic acquirers are not chasing every deal that comes across their desks, they are aggressively bidding on companies that enhance their long-term core growth strategies. Corporate scandals and a difficult macroeconomic environment forced companies to focus internally for most of 2001-2003. With many of these negative factors replaced with more positive news in 2004, strategic acquirers aggressively re-entered the M&A market.

We develop further the current situation in the following chapters of our work.

2.2.1.3 Future development in the US market

Even if the US financial merger market has been characterized by a huge consolidation process in the last few decades, we expect merger activity to gain further momentum because:

- Strategic acquirers have returned to the M&A market and are actively seeking growth opportunities through acquisitions.
- We believe financial buyers will continue to be aggressive in the next few years due to an improved fundraising environment and favourable financing markets. The overall economic outlook is more positive and stable compared to 2004. While there

⁵ transactions involving the purchase of U.S.-based companies in the range of \$50-500 million



are certainly risks that could disrupt the macroeconomic environment, including a devalued U.S. dollar, increased commodity pricing and residual uncertainty in Iraq, we believe that the core drivers of the M&A market, particularly those in the middle market, are intact and provide a strong base for increasing momentum throughout 2006. 2007. We believe that we will continue to see an increase in the quality of transactions, which should continue to drive higher dollar volume.

- Private equity activity continues to be a major driver of transaction activity. Financial buyers are poised to provide an increasing supply of companies to the M&A market as they reach the end of their hold period for companies they purchased during the boom years of 1997- 2000.

Further the next few years will be characterized by an increased interest in cross border activities. In fact even if the US market could be, in a relatively short period of time, saturated, there are several geographic areas where the possibilities of expansion are very huge. We can cite for example China or Eastern Europe.

2.2.2 M&A situation in Europe

2.2.2.1 *Historical overview*

1990-2000

Similarly to the US market, the recent years have been characterized by a general growth in M&A activities. In Europe, banking assets as a percentage of GDP (gross domestic product) grew from 177.2% in 1985 to 244.2% in 1997⁶, but the number of European banks drastically decreased from 12,670 in 1985 to 8,395 in 1999⁷.

This change is manly driven by mergers and acquisitions. But the process of consolidation that has been characterized the US in the last 20 years, is a phenomena more recent in Europe. Roughly two thirds of European M&A activity in the 1990s, as measured by the total value of transactions involving the acquisition of a European financial firm, occurred during the last three years of the decade. (see table 2-5)

⁶ European central bank 1999

⁷ European central bank 2000



Overall, firms in the European countries engaged in fewer, but generally larger transactions than North American institutions. The total value of all European deals, in the same period of time, however, was only about half that of North American deals.

Merger activity, as measured by the value of firms acquired, was primarily concentrated in the banking industry, which accounted for about 65% of the total. Insurance was the second most active industry at roughly 25%. In both the banking and insurance industries, average European acquisition values were substantially higher than averages in North America. In contrast, values were lower in European deals involving firms in the securities/other industry (Federal Reserve (2001)).

As with the other global regions, domestic, cross-industry consolidation in Europe was less common than domestic, same-industry activity. Compared to North America, however, domestic, cross-industry consolidation exhibited a different pattern over time in terms of the number of firms being acquired. In Europe, the number of acquisitions remained fairly steady in the latter half of the decade, although registering a one-year slump in 1998. At the end of 1999 the room for expanding was huge: the number of banks per 1,000 inhabitants in Europe was almost twice as large (0,49) as in the US(0,27) showing that the European sector has still big possibilities to evolve (Berger, Demsetz et all (1999)).



All European countries
All values in USD millions
Deals classified by country and sector of target firm

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Deal type												
Within border/ within industry	Number	31	181	174	137	159	132	157	123	141	181	1436
	Total value	4679.9	10392.0	12561.7	24094.6	10840.4	21994.9	25550.9	48985.4	67829.7	116379.3	343308.8
	Avg value	212.7	216.5	314.0	523.8	208.5	458.2	381.4	765.4	880.9	1454.7	631.1
Within border/ cross industry	Number	25	47	48	45	60	70	70	59	36	59	519
	Total value	11682.3	3574.7	1477.9	1451.1	1553.8	2851.2	2311.1	17548.1	19827.0	8785.9	21113.1
	Avg value	834.5	255.3	70.4	60.5	59.8	101.8	72.2	531.8	946.5	225.3	282.2
Cross- border/ within industry	Number	24	28	31	31	41	56	49	61	62	52	435
	Total value	4920.0	487.9	1065.6	4025.4	3484.6	6139.7	4561.6	16615.6	8571.4	19420.5	65342.3
	Avg value	492.0	81.3	106.6	370.5	205.0	255.8	240.1	553.9	267.9	642.5	359.1
Cross- border/ cross industry	Number	10	16	11	9	15	16	17	21	25	19	159
	Total value	1487.4	326.4	2034.4	509.0	201.0	1065.0	525.2	5157.9	6804.9	6439.9	24551.1
	Avg value	247.9	54.4	339.1	169.7	40.2	133.1	87.5	468.9	425.3	536.7	310.8
Deal type												
Within border	Number	76	228	222	182	219	202	227	182	177	240	1955
	Total value	16362.2	13966.7	14039.6	25545.7	12394.2	24846.1	27862.0	66533.5	87706.7	125163.2	414421.9
	Avg value	454.5	225.3	230.2	364.9	158.9	326.9	281.4	685.9	895.0	1051.8	520.6
Cross- border	Number	34	44	42	40	56	72	66	82	87	71	594
	Total value	6407.4	814.3	3100.0	4584.4	3685.6	7204.7	5086.8	21773.5	15376.3	21860.4	89893.4
	Avg value	400.5	67.9	193.8	327.5	167.5	225.1	203.5	531.1	320.3	607.2	343.1
Deal type												
Within industry	Number	75	209	205	168	200	188	206	184	203	233	1871
	Total value	9399.9	10879.9	13627.3	28170.0	14325.0	28134.6	30112.5	65601.0	26401.1	131799.8	408651.1
	Avg value	300.0	201.5	272.5	494.2	207.6	390.8	350.1	697.9	200.9	1267.3	562.1
Cross- industry	Number	35	63	59	54	75	86	87	80	61	78	678
	Total value	13169.7	3901.1	3512.3	1960.1	1754.8	3916.2	2836.3	22706.0	26681.9	15223.8	95664.2
	Avg value	658.5	195.1	130.1	72.6	56.6	108.8	74.6	516.0	221.1	298.5	289.0
Industry												
Banking	Number	51	135	131	110	147	116	109	110	148	169	1226
	Total value	17424.2	10457.4	11578.0	10396.2	9105.8	27421.3	8476.9	45983.5	71525.5	113210.9	326079.7
	Avg value	670.2	255.1	289.5	253.6	182.1	559.6	197.1	836.1	841.5	1307.0	630.7
Insurance	Number	27	46	49	44	37	56	70	76	61	41	507
	Total value	3587.7	1983.2	3854.8	10666.1	5706.1	892.5	17911.5	35621.3	28209.7	18027.9	126565.8
	Avg value	299.0	198.3	257.0	561.4	335.7	64.1	612.6	849.3	922.7	1291.3	629.7
Securities/ Other	Number	32	91	84	68	91	102	114	78	55	101	816
	Total value	1757.7	2340.4	1706.8	9067.8	1267.9	3732.0	6560.4	6652.2	3347.8	15236.8	51669.8
	Avg value	125.6	101.8	77.6	327.8	38.4	82.9	126.2	162.2	104.6	282.2	152.0
Total	Number	110	272	264	222	275	274	293	264	264	311	2549
	Total value	22769.6	14781.0	17139.6	30130.1	16079.8	32050.8	32948.8	88307.0	103083.0	147025.6	504315.3
	Avg value	437.9	199.7	222.6	358.7	160.8	296.8	265.7	639.9	206.0	948.6	476.7
GDP	6472416	6738836	7343355	6658502	2072407	8060793	8198137	7681151	7921755	7888743	74036296	
Value/GDP	0.35%	0.22%	0.23%	0.45%	0.23%	0.40%	0.40%	1.15%	1.30%	1.86%	0.68%	

table 2-5, European deals between 1990-1999, source: Federal Reserve, 2001



2000-2006

Like in US, M&A activities reached their peak in 2000\2001 boosted by a general positive economic period. After the 11th of September 2001, as we all already know, there was a deep depression and a huge economical crisis. In the next two years the economy slowed and as consequence of a general recession, M&A activities decreased rapidly. (see graph 2-5, evolution in European deals, source: Thompson financialgraph 2-5)

Now the situation seems to be changing another time: the last two years were characterized by a quite evident growth. In fact in 2004, European financial services ('FS') deal⁸ activity increased by approximately a third in terms of total announced deal value and total deal numbers compared with 2003, even if the growth, is mainly driven by some big operations.

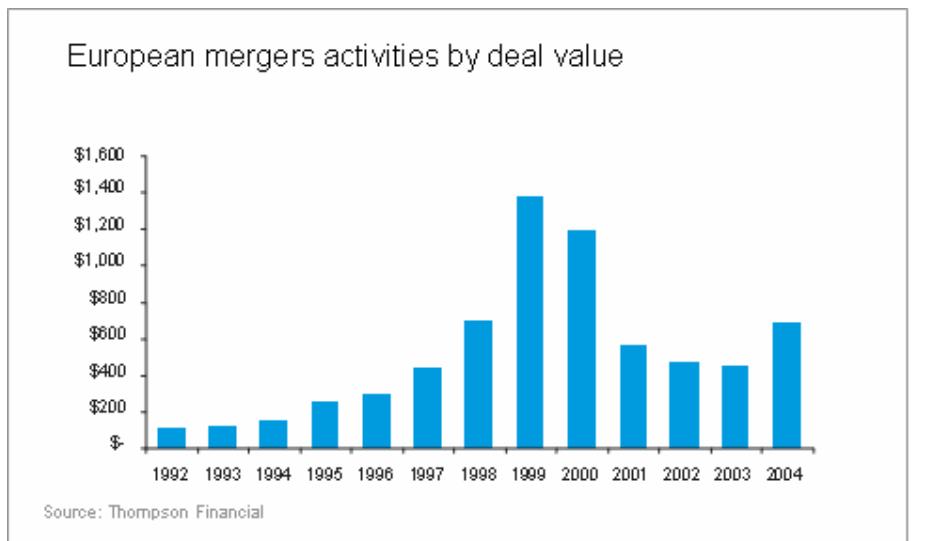
In particular €44.8 billion of deals^{9,8} were realized in the European financial services sector, making financial services the second most active sector in Europe after pharmaceuticals.(see graph 2-6) This is an increase of €11.3 billion (34%) from the total in 2003 (€33.5 billion). Compared with 2003, there was a significant increase in the proportion of cross-border deals, representing 61% of all financial services activity in 2004 (measured by value) (Price WaterHouseCooper (2005)). We are still yet to see a significant increase in financial services deal activity to the levels last seen in 2000, but the trend seems to going in this direction. In particular in 2004/ 2005, the UK and Ireland were the most popular place for FS M&A by far, accounting for nearly two thirds of all deal activity (measured by value).(see graph 2-7)

Banking was again the most active financial services sector accounting for over half of all deals (measured by value), dominated by Santander Central Hispano's €12.3 billion acquisition of Abbey National un 2004 and in 2005 by Unicredito Italiano S.p.a's € 18 billion acquisition of Bayerische Hypo- und Vereins.

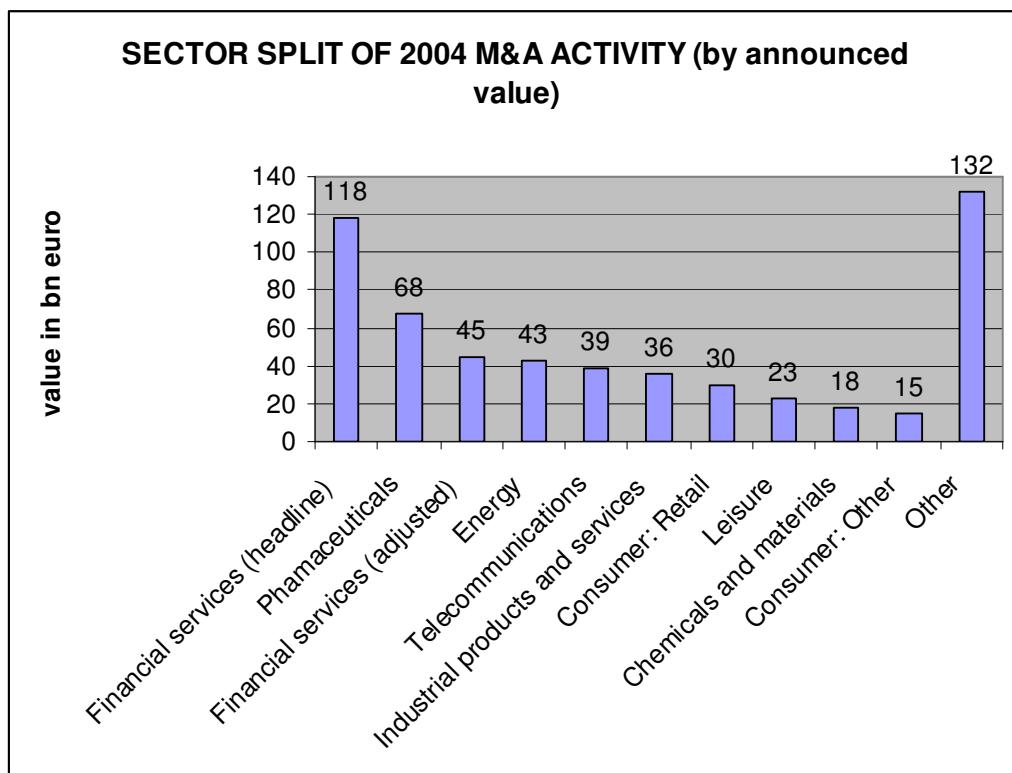
⁸ European financial services deal is defined as a deal that was announced in 2004 and involved the acquisition of a majority stake (or a major stake giving control to the acquirer) in a target that was based in Europe.

⁹In order to compare 2005with 2004 data, we use the classification of Price WaterHouseCooper of financial deal, that is reported in the note 8





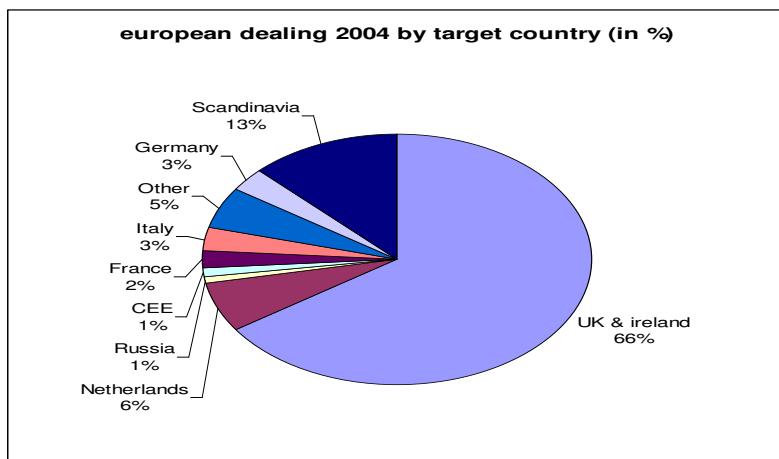
graph 2-5, evolution in European deals, source: Thompson financial

graph 2-6, M&A activities split in sectors, source: mergermarket and PwC analysis 2005¹⁰

¹⁰ Price WaterHouseCooper have excluded the following types of deals from financial services (headline):

- Deals that involved the acquisition of a non-European target by a European financial services company.
- Those deals that are not ‘true’ financial services, e.g. real estate deals.
- Deals involving the sale or purchase of small or minority stakes.





graph 2-7, market overview ,source:mergermarket 2005¹¹

Further the last few years have been characterized by:

- Continuous focus on disinvestment of non core business activities
- A focus on local and neighbouring markets. Middle size companies that have not reached the critical mass to make large scales cross border operations, have achieved growth through local and neighbouring market (e.g. Scandinavia)
- Niche market acquisitions, particularly in UK
- An increased appetite from private equity investors

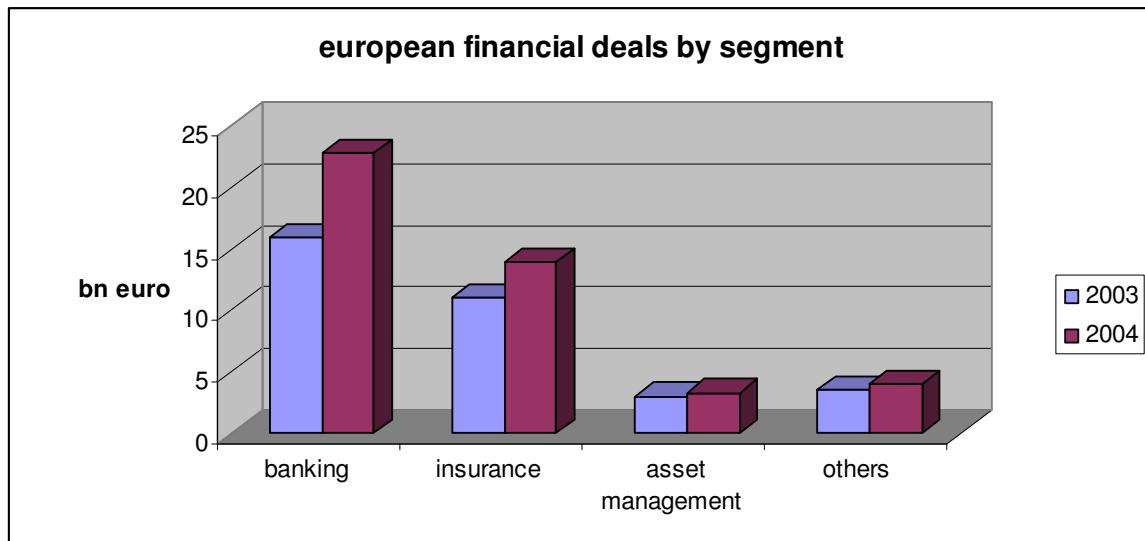
If we then analyse the growth in the different segment, according to a report done by Price WaterouseCooper in June 2005, it is interesting to see a general growth in each financial area. (see graph 2-6)

However, the sector that seems to be characterized by a more regular growth is the insurance. In fact in the banking area an extraordinary operation was realized (Santander/Abbey deal), and if we don't consider this operation, the banking activity has decreased year on year, offset primarily by growth in the insurance sector. (see graph 2-9)

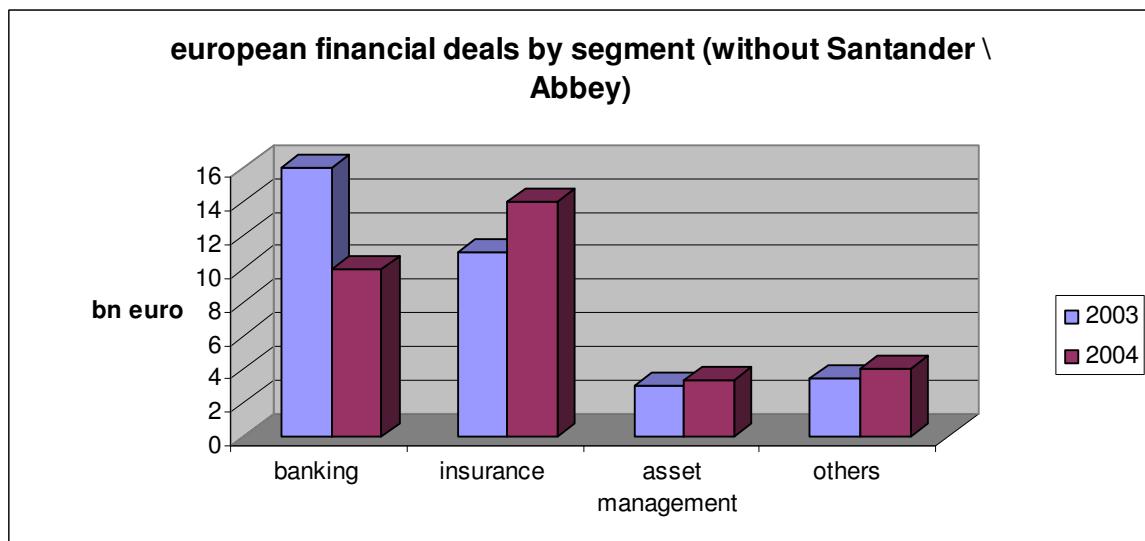
• Deals for which the value of the equity interest sold was not disclosed, e.g. sales and purchases of asset portfolios where the disclosed deal value represents the value of the assets sold.

¹¹ Scandinavia is defined as Norway, Sweden, Finland and Denmark. CEE is defined as Poland, Hungary, Czech Republic, Romania, Estonia, Lithuania, Slovenia and Bulgaria.





graph 2-8, European deals by segment ,source: Price WaterHouseCooper



graph 2-9, European deals by segment (without Santander\ Abbey), source: Price WaterHouseCooper

With the exception of the Santander/ Abbey deal, the top 10 operations also indicates an interesting trend, with only HSBC of the major European headquartered banks (e.g. Barclays, RBS, UBS etc.) and none of the insurance giants (e.g. Allianz, Aviva, Generali, etc.) involved in a major European deal.



The 2004 acquisition activity in Europe was, for the most part, driven by smaller financial institutions. Significantly, four of the top 10 deals were private equity backed, something that was not a feature of 2003. All were UK deals and two were closed life book purchases.

2.2.2.2 *Types of deal: domestic versus cross border*

2.2.2.2.1 Domestic deals:

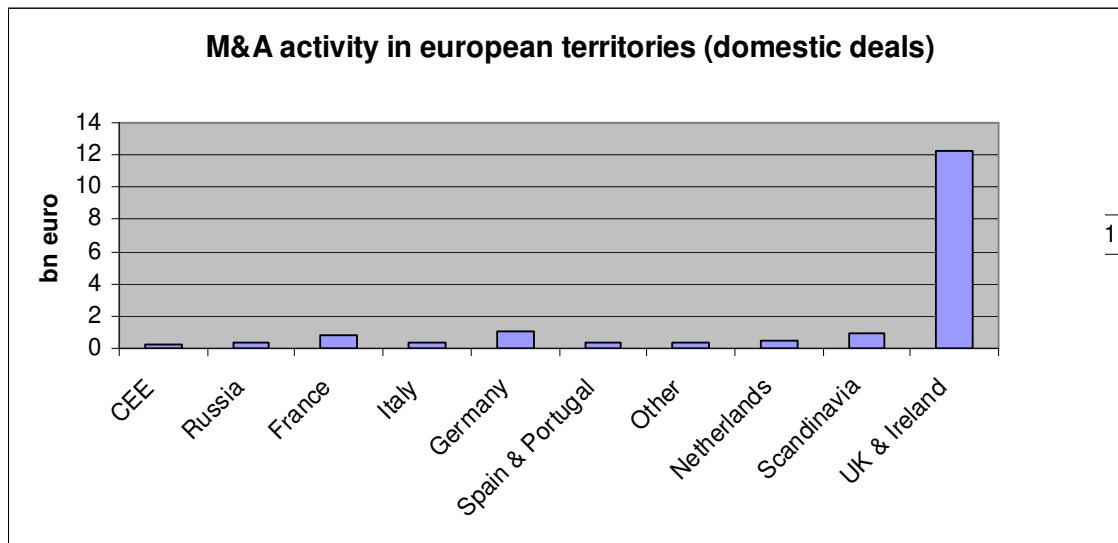
So far, most of financial deals in Europe, have been domestics. In particular if we analyze the period between 1999 and 2004 the percentage of domestic deals is about 80% (data measured by deal value).

This tendency is now changing or at least decreasing. That is advisable from the €17.0 billion of domestic deals undertaken in 2004, a decline of €5.8 billion from the level in 2003, even if the significant overall decrease in European domestic activity can partly be attributed to the high level of extraordinary Italian domestic M&A activity in 2003, which decreased from €7.2 billion (bolstered by two large divestments of the Italian insurance businesses of Fiat and Winterthur) to €0.4 billion in 2004 (Price WaterHouseCooper (2005)). In particular these domestic operations were mainly driven by the need of mid-sized institutions thanks to the acquisitions of similar sized competitors, in order to grow and compete with the key players in their home market. .

Examples of acquisitions of this nature are Aktiv Kapital's acquisition of its Norwegian consumer creditor competitor, Olympia Capital, for €262 million and the acquisition of F&C by ISIS for €1.1 billion.

Further there is a tendency to disinvest small scale non core activities. These business are in general acquired by domestic rivals e.g. Sal. Oppenheim's acquisition of ING BHF-Bank for €610 million and the €59 million acquisition of the Italian private banking arm of Credit Agricole from Calyon by Banca Intesa.





graph 2-10, domestic deals, source: merger market 2005

2.2.2.2 Cross border

Today the process of mergers among financial institutions of different countries is acquiring great interest and importance.(see graph 2-11) In fact cross-border activities represents today a solution for banks to realize their optimal size, to reap economies of scale and scope, to diversify activities to spread risk and revenues and overall to reach new market.

This in turn enables them to improve resource allocation and risk management and to increase profitability. Banks often prefer to expand into foreign jurisdictions via cross-border mergers or acquisitions rather than to establish a local presence from scratch or to provide services directly across borders. The main reason is that banks consider M&As with local institutions as an important tool to attain a sizeable market share in the foreign market within a short period of time, given the possibility to benefit from the existing access to local distribution channels and the established customer base

Further through the international expansion of banking groups and interbank competition, these beneficial effects are expected to spread to the European banking sector as a whole, fostering closer convergence towards better, more efficient banking practices, deepened integration and greater breadth, depth and liquidity of the markets (Jose Manuel Gonzalez-Paramo(2006)).



Ultimately, progress in the development and integration of the banking sector will also have a positively effect on macroeconomic performance. (Jose Manuel Gonzalez-Paramo (2006)).

But the cross border consolidation¹² among financial institutions has been proceeding at a slow pace and is characterized by different deal size if compared with the not financial sector. In fact in the last decade, cross border EU deals accounted for around 20% of the total value of deals within the financial sector. Despite similar proportions in terms of number of deals, the proportion of cross border transactions in value equalled 45% when looking at other sectors (European commission, Brussels (26.10.05)). That means that in the financial sectors, domestic deals are normally larger than cross border ones (leading to domestic champions strongly focused on one country). By contrast in the non financial sector, cross border deals appear to be larger than domestic ones, with a differential in size of the acquiring and the acquirer smaller than in the financial sector, leading to global European leader in the whole market with a more balanced break down activities across countries (European commission, Brussels (26.10.05)).

Now the situation seems to be changing. The number and value of cross-border M&As has increased from less than 20% during the early 1990s to around 30% of total M&A transactions nowadays. If we then give a look to 2004, we can notice how the cross border operations, by deal value, exceed the domestic ones: €27.8 billion of cross-border deals were announced in 2004, representing 61%¹³ of the total deal market (measured by value) and an increase of €16.5 billion (Price WaterHouseCooper (2005)).

When we look at this data we have to keep in mind that was highly influenced by the Santander/Abbey deal in the UK (€12.3 billion). But this date is a symptom that the situation is changing and cross border activity start to play a key role in the European context. Further it reflects the fact that large institutions will carry out cross-border deals if there is an appropriate target.

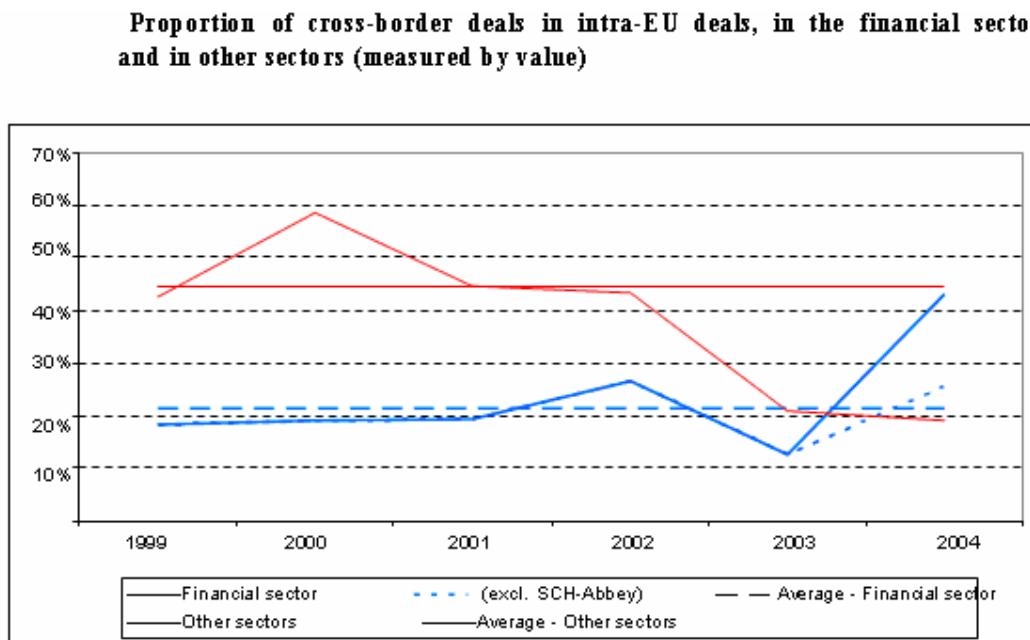
¹² Cross border consolidation here means consolidation involving entities located in different EU Member States. Domestic Consolidation is to be understood as consolidation occurring within a single EU Member State.

¹³ Price WaterHouseCooper have excluded the following types of deals from financial services (headline):

- Deals that involved the acquisition of a non-European target by a European financial services company.
- Those deals that, are not ‘true’ financial services, e.g. real estate deals.
- Deals involving the sale or purchase of small or minority stakes.
- Deals for which the value of the equity interest sold was not disclosed, e.g. sales and purchases of asset portfolios

where the disclosed deal value represents the value of the assets sold.





Source: Bureau van Dijk, Zephyr database

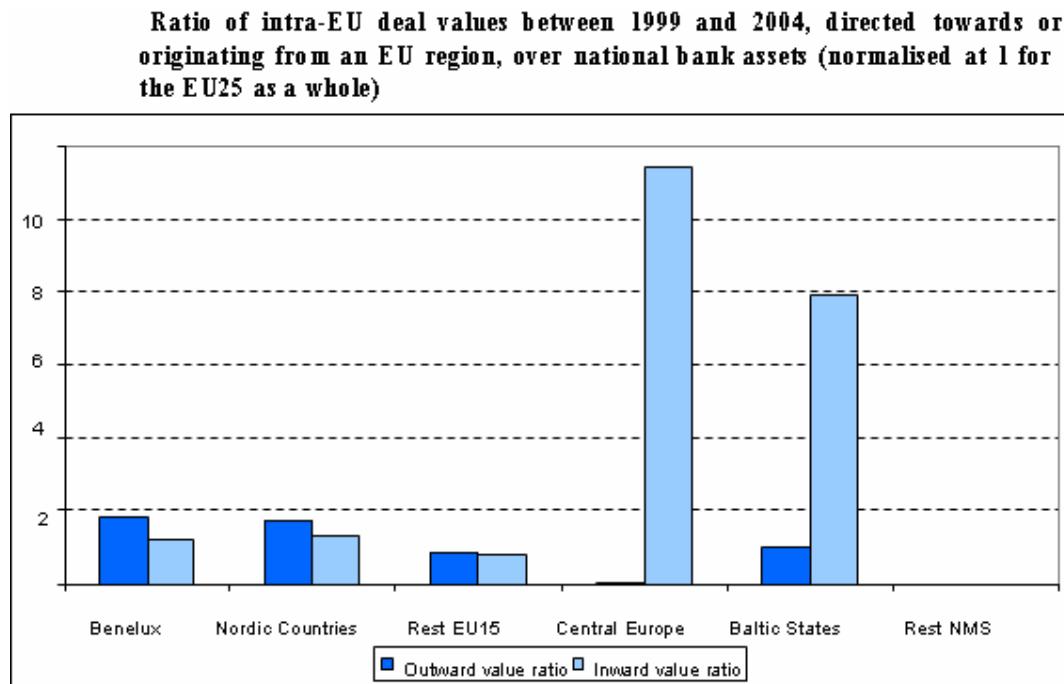
graph 2-11, proportion of cross border deals, source: Bureau van Dijk, Zephyr database

This recent growth can be related to technological innovation, the reduction of regulatory barriers to cross-border activities, and the introduction of the euro, that entails an elimination of the uncertainty and exchange cost connected with several currencies. Cross-border banking in the EU has picked up considerably in recent years. To compete effectively in the European markets, banks may choose to undertake cross border deals.

Further is interesting to notice how in 2004, around 30% of the EU banking sector was owned by non-resident banking groups, up from around 20% in 1997 (Jose Manuel Gonzalez-Paramo (2006)). There are, however, large differences between individual EU Member States. The cross-border dimension is particularly relevant for the new Member States, which typically act as host countries for banking groups from other EU countries. Using total assets as a proxy for estimating the size of the financial sector, it can be seen that acquisitions have been 8 to 11 times more intense in new Member States, than in EU15 countries ((European commission, Brussels (26.10.05)). On average around 70% of the domestic banking sector assets in the new Member States are foreign-owned. This is mainly due to an increased economic stability in the southern and eastern markets in Europe. This stability has brought



investment (totalling approximately €2 billion) from established companies looking for higher returns than they can achieve in their home territories. (see graph 2-12)



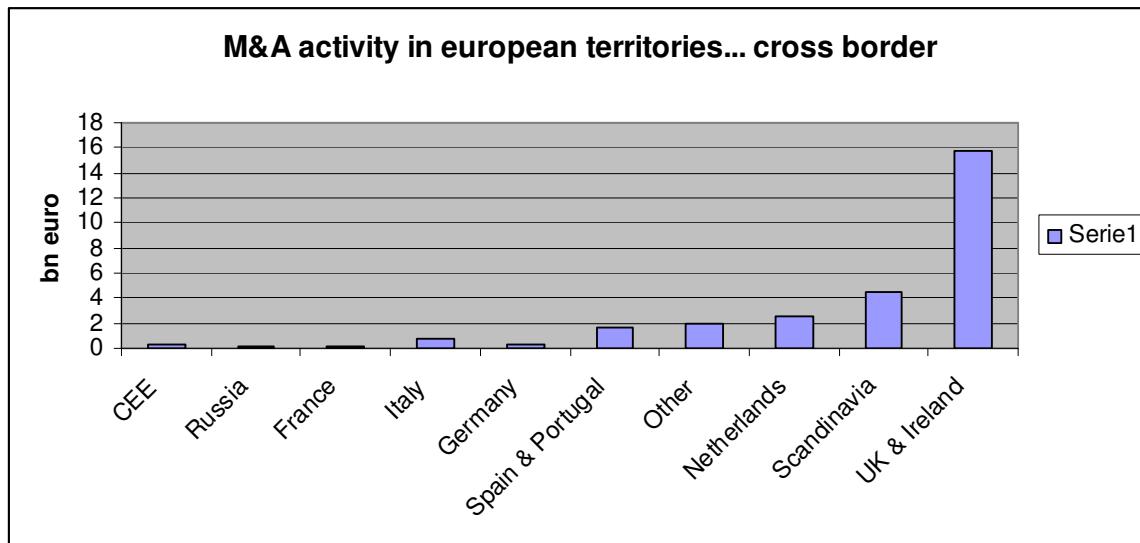
Source: Bureau van Dijk, Zephyr database

graph 2-12, European deals by regions, source: Bureau van Dijk, Zephyr database

The presence of foreign banks is also quite prominent in other EU countries, notably the United Kingdom, Luxembourg and Ireland, which all have an important role as financial centres. By contrast, other Member States have a relatively low presence of foreign banks – on average around 10% – either because they provide the home base for large internationally active banking groups or because of factors such as comparatively higher entry barriers and lower contestability (Jose Manuel Gonzalez-Paramo (2006)). (see graph 2-13)

It is then very interesting to see how in Europe there are several regional clusters, within the development of cross border operations are more likely. In particular there are two main clusters: Benelux (Belgium, Luxembourg, The Netherlands) and the Nordic Countries (Denmark, Sweden, Finland). The graph 2-14 gives a general overview of this phenomena: the rows correspond to the location of the acquirer and the columns to the location of the target.





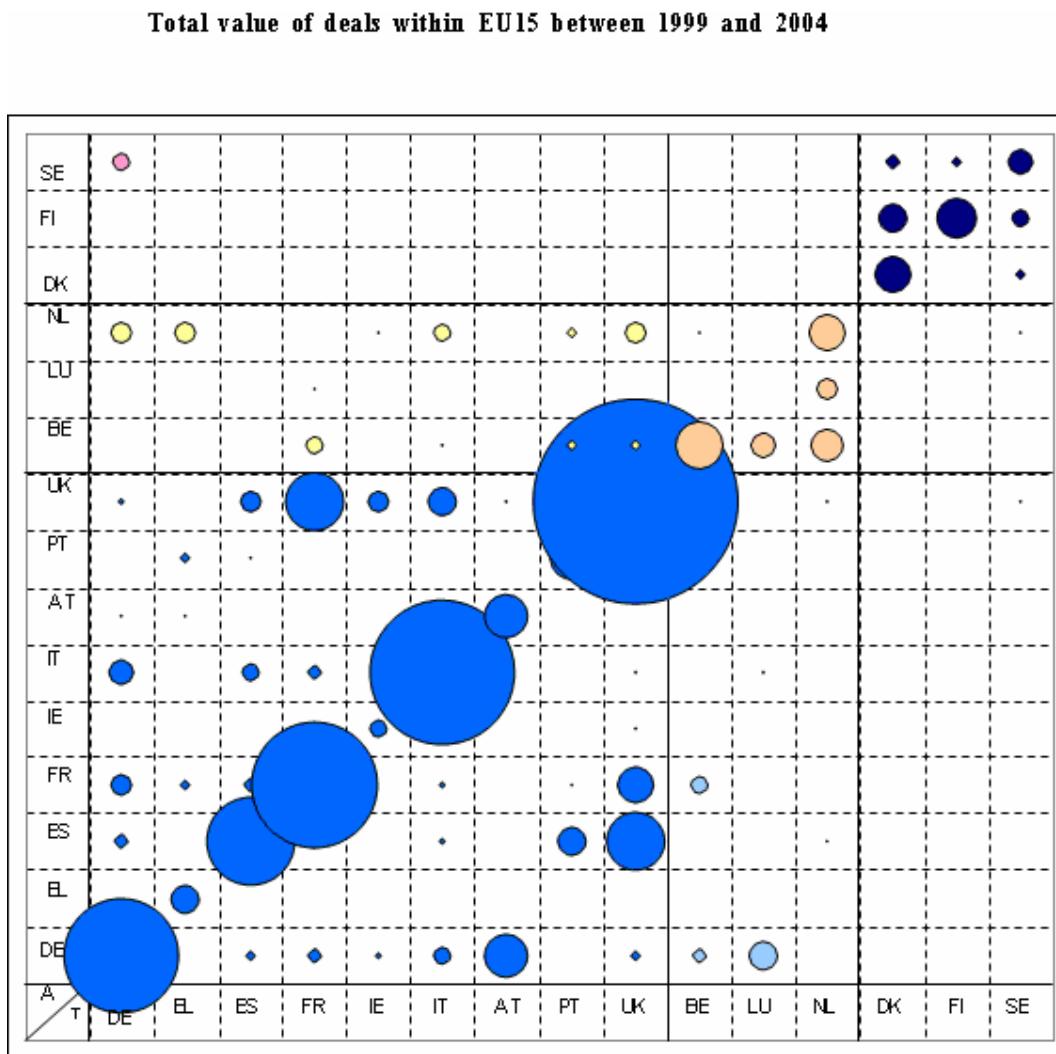
graph 2-13, cross border deals, source: merger market 2005

The size of the bubbles is proportional to the total value of transactions between 1999 and 2004. The largest bubble (UK/UK) corresponds to a total deal value of €143.6 billion. Especially, how can be seen in this graph, in the Nordic cluster the intra regional deals represent 90% of the deals involving at least one Nordic entity. For the Benelux this ratio is 60%. Within the EU 15, intra regional flows are attributable mainly to geographical proximity.

In recent years there have been some particularly prominent examples of cross-border M&A activity, including for example the Spanish company Santander's acquisition of the British bank Abbey National in 2004 and major moves by Danske Bank, Unicredit, and ABN AMRO in 2005. The scale of Abbey indicates that Santander have reached a conclusion regarding local consolidation in the Spanish market and decided to move in a new market to further grow and balance their earning stream.

It should be noted, however, that cross-border M&A transactions in the EU banking sector are still limited when compared to other financial sectors, where cross-border deals generally account for around 45% of all M&As (Jose Manuel Gonzalez-Paramo (2006)). In addition, much of the cross-border M&A activity in the EU banking sector has focused on regional clusters, especially in the Benelux, the Nordic/Baltic region and in Southern, Central and Eastern Europe.





Source : Bureau van Dijk, Zephyr database

graph 2-14, deals value ,source: Bureau van Dijk, Zephyr database,

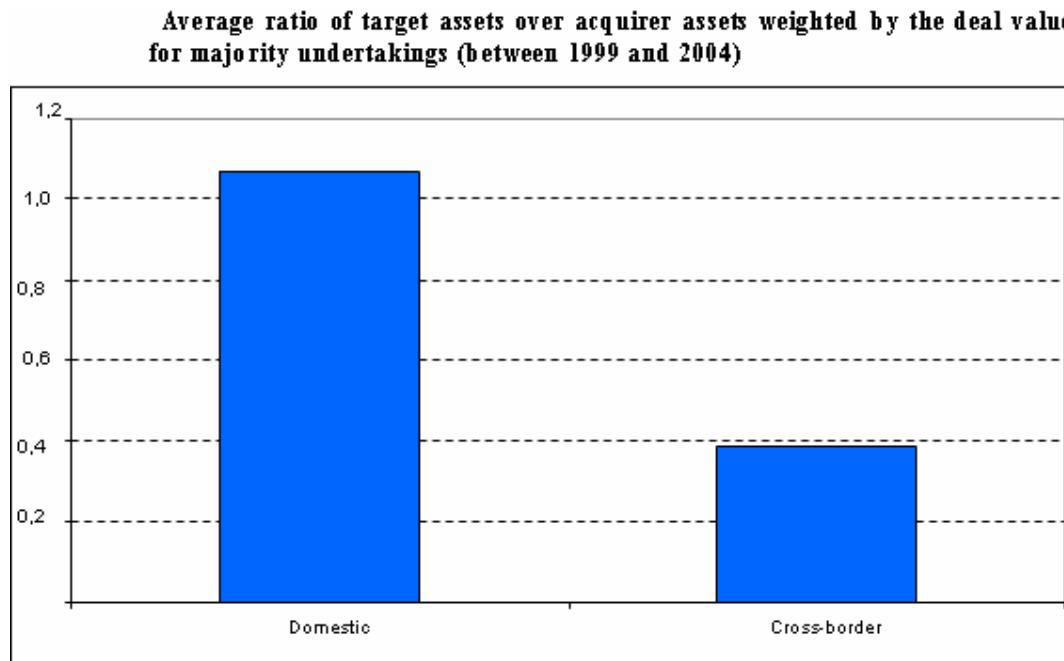
2.2.2.3 Distinctive characteristics between cross border and domestic deals in the financial sector.

The main aim of this chapter is to underline the main differences between domestic and cross border deals in the financial sector.



Different bidder size:

The size of the bidder in a cross border deal is generally much bigger, whereas such difference can not be noted in the dimension of the targets. (see graph 2-15) As results there is a big difference between cross border transactions and domestic ones in the ratio between the target and bidder size, as measured by total assets.



Source: Bureau van Dijk, Zephyr database

graph 2-15, deal size, source: Bureau van Dijk, Zephyr database

That could be interpreted in this way: only large institutions engage cross border deals, and in doing so, they are indeed competing with the smaller local players in acquiring the same targets (European commission, Brussels(26.10.05)). In general there is a kind of fear by middle\small size company to undertake a cross border operation. This could be related to the main problems connected with a cross border deals, that we will see later in this chapter.

Sectorial mix of transactions:

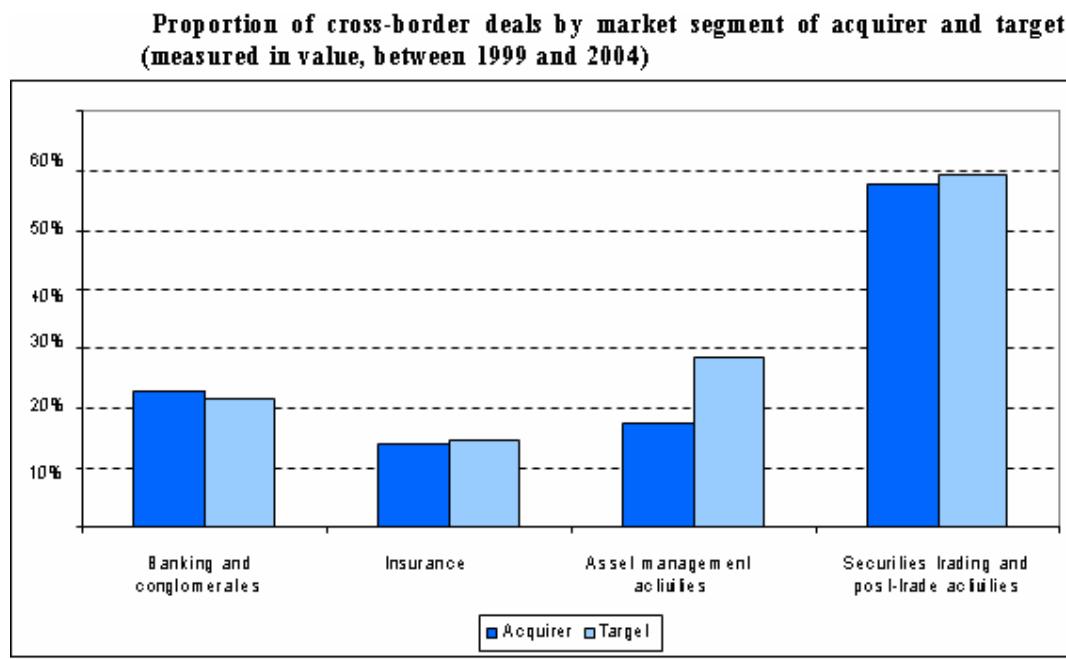
Cross border deals are usually done between two players within the same sector. Just to give an example, whereas “bank buy domestic insurance company” represents around 10% of the total domestic acquisitions by banks, “banks buys foreign insurance company” represents



only 4% of the total cross border operations (European commission, Brussels(26.10.05)). In domestic transaction cross – sectorial diversification is more commonplace, which can be probably explicated by relatively high concentration ratios in some markets that drive companies to growth outside their core sector, or maybe just because the risk involved in a cross border operation in a different sector is or could appear too high.

Market segment of target and bidder:

Some differences can be noticed if we focus on the different segment characterizing the financial institutions. In particular cross border characterized overall “securities trading and post-trade activities”, while in other segments, such as banking, insurance and Asset management, the proportion of cross border deal is lower. (see graph 2-16)



graph 2-16, cross border deals by segment, source: Price WaterHouseCooper

In the area of banks, insurance, and Asset Management the proportion of cross border operations is lower than financial sector in average, with proportionally more minority acquisitions and significantly larger domestic deals. In the area of securities activities, cross border transactions are far more frequent, are comparatively larger than domestic ones, and consist more often of acquisitions of controlling stakes.



To sum up, in Europe a double process is taking place: domestic mergers are mainly leading to the creation of domestic merged entities, who are competing with large cross border groups, which growth with smaller acquisitions.

2.2.2.2.4 Why this lag in cross border consolidation?

There are several factors that contribute to hamper the development of cross border deals. In order to understand these factors, the European Commission in 2005 conducted a survey of the main players in the European financial institutions, on why cross border consolidation in this sector was proceeding at such a slow pace. Those factors can be grouped into three broad categories:

- *Barriers to market access*: obstacles that may block the deal. Some obstacles in this category are not materialized and therefore may not have a direct cost, but the simple perception may deter from initiating a merger process.
- *One-off cost*: caused by the execution of cross border deal, and would not exist in a domestic operation.
- *On going cost*: additional costs in the management of the merged entities, once the merger is undertaken, which would not exist in a domestic operation.

Here we have categorized briefly the main factors.

Barriers to market access

The main obstacles in this category can be summarized in this way:

- *Political interferences*: misuse of supervisory power to obstacle an operation. In Italy in our recent history there are several examples of political interference. Just in order to make an example, we can cite the last year intended operation between Holland's ABN Amro Holding NV and Banca Antonveneta.
- *Defence mechanism*: we can cite like example poison pills, golden parachute, double voting rights.
- *Impediments to effective control*: methods to limit or control on foreign participants.
- *Consumers negative perception of foreign entities*: a public opposition may influence analysts' assessment
- *Employees and shareholders' reluctance*



One-off costs

- *Restriction on the type of offer that can be executed:* cash only or exchange of shares
- *Multiple report requirement:* a cross border merger could entail a heavier reporting requirement, compared to those imposed on two domestic entities that are being merged.
- *Additional transaction cost*

Ongoing costs

- *Employment legislation:* could create barriers for efficient and flexible reorganization
- *Non overlapping fixed costs:* when two companies merge, most of the time, the cost synergies savings (for instance IT..) are not sufficient to offset the merger costs. Similarly the saving cost in a cross border operation are smaller than in a domestic one, making them less attractive. Related to this category we have some cost voice such as multiple reporting requirements, divergence of supervisory practices, complexity of supervisory approval process, consumer protection rules...
- *Differences in tax treatment:* taxations on dividends, inter group VAT
- *Differences in product mix:* difficulties in selling the same product across countries at the same price

2.2.2.5 Further problems related to cross border deals

As we have already pointed out, the introduction of euro has accelerated the speed of financial market integration and is encouraging cross-border activity by financial institutions, partly through consolidation. Therefore, if cross-border interdependencies grow rapidly across European countries, the probability that a banking crisis in one country will affect the banking systems of other countries is likely to be higher in the future.

The current framework of harmonised directives across EU countries and the arrangements in place for extensive bilateral and multilateral cooperation, such as the Banking Advisory



Committee, the Banking Supervisory Committee and the Groupe de Contact, provide a comprehensive framework for the management of banking crises. Still, European national authorities should increase the harmonisation of their policies and the coordination of actions taken in the prevention and management of crises, along the lines suggested recently by the European Union Economic and Financial Committee in its Brouwer Report (2000).

But in Europe, because of the number of sovereign nations involved, the cross-national problems that usually arise in all nations when merging institutions try to integrate across national borders tend to be more immediate and relatively intense. Such difficulties can derive from, for example, differences in national law and custom. These complexities are in addition to the standard problems that often appear from efforts to combine different corporate cultures. In both cases, integration complexities can affect the risk profiles of the firms involved.



2.3 Future scenarios

The last recent years have been characterized by a general growth of M&A activities. The point is now to determine if this is a stable long run trend or it was only an extraordinary growth. In our opinion a general growing tendency will be present in the next future. In fact if the main focus of the financial institutions is always being to manage the business predominately through cost control, the move in the few last years seems to be to manage these business for growth. This is confirmed by two survey.

The first one is an informal survey of around 100 major EU banks, conducted by the ESCB's Banking Supervision Committee (BSC) in early 2005, revealed a strong interest in pursuing further cross-border M&A transactions in the coming years. Around half of the respondent banks saw this as an important factor shaping the future EU banking environment. In addition, the recently executed large cross-border M&A deals have served to renew the public debate on whether this may mark the start of true cross-border banking integration in the EU.

The second was done in May 2005, by Price WaterHouseCoopers , in association with the Economist Intelligence Unit, published a briefing entitled 'Focus on growth: Striking the right balance within financial services'. The survey results reported:

- 65% of the 201 financial services executives surveyed agreed that managing for growth had become a higher priority over the past 12 months, and the majority are expecting revenue growth this year of more than 10%;
- Alliances, joint ventures and M&A featured prominently as strategies to be employed to achieve growth targets

The further growth of cross-border banking may be supported by the present generation of significant excess capital in the European banking sector and the high degree of concentration of many local banking markets, which renders further M&A operations at the domestic level increasingly difficult. At the same time, several factors may stimulate the move towards bigger entities and reduce barriers to cross-border consolidation. These include: ongoing technological developments and related opportunities to create IT synergies; several changes in the regulatory framework, which will enable cross-border banking groups to benefit more fully from the risk-reducing effects of capital diversification; and the recent harmonization of EU accounting standards, which makes it much easier to compare information on the financial



position of banks in the EU, thereby facilitating cross-border M&A activity. Finally, defensive reasons may play a role, as EU banks may wish to look for further cross-border M&A opportunities with a view to competing effectively with larger institutions in the global marketplace.

As we have already said, financial consolidation is likely to continue. At least three reasonable and not mutually exclusive scenarios can be distinguished, and the future balance among these possibilities is impossible to project with any reasonable degree of confidence.

1. Continuation of the current trend towards globally active universal financial service providers. Under this scenario, M&As both within segments of the financial industry and across segments would continue, as well as between financial and non-financial entities (where permitted by law).
2. Continued consolidation resulting in functionally specialised financial firms. Under this scenario, firms would become more specialised as they grow in part through mergers of firms within a given segment of the financial industry, combined with the spinning-off of non core lines of business.
3. Continued consolidation along with a gradual "deconstruction" of the supply chain of financial services. In this scenario, in some ways a more extreme form of scenario (2), firms specialise in the production of particular components of financial services or in the distribution to end users of products obtained from specialised producers (e.g. internet services) either within or outside the traditional financial services industry. As the costs of merging rise, particularly between large entities, looser forms of consolidation, such as strategic alliances or joint ventures, may become attractive alternatives within the context of any of these scenarios.

In the future chapters we'll try to have a better understanding of these possible scenarios.



3 Identifying the explanatory variables

This chapter is divided into three parts. In the first one we analyse the reasons for a company to undertake a merger and, from that, we deduce the variables which explain them. In the second we give a brief description of the main papers dealing with bank mergers from a quantitative point of view. Finally in the third one we find out how the variables identified in the part one impact on the value according to the papers analysed in the second part.



3.1 Why undertaking a merger?

In this chapter we will try to answer the key question: what are the main determinants or motives behind mergers and acquisitions?

The reasons for a company to undertake a merger can be basically classified into two classes: basically a merger should be run when managers expect that it creates value for the stockholders; all the reasons consistent with that scope are part of the first group. Nevertheless very often we observe that managers undertake mergers to benefit from personal returns, so we put these reasons in the second class. In paragraphs 1 to 4 we analyse the first group, in paragraph 5 the second one.

3.1.1 Definition of added value

Let's call V_B and V_T the value of the bidder and the one of the target, respectively. We say that a merger is successful if the combined value after the merger is higher than the sum of the two companies standing alone, that is:

$$V_{BT} > V_T + V_B$$

We define AV the value added through the merger, that is

$$AV = V_{BT} - (V_T + V_B)$$

These arguments put forward a key question: who benefits from this added value? The added value is basically shared between the shareholders of the target and the ones of the bidder, but who decides the way it gets split? The bidder has to pay a premium, P , in order to induce the stockholders of the target not to pass up its offer and accept to go trough the merger.

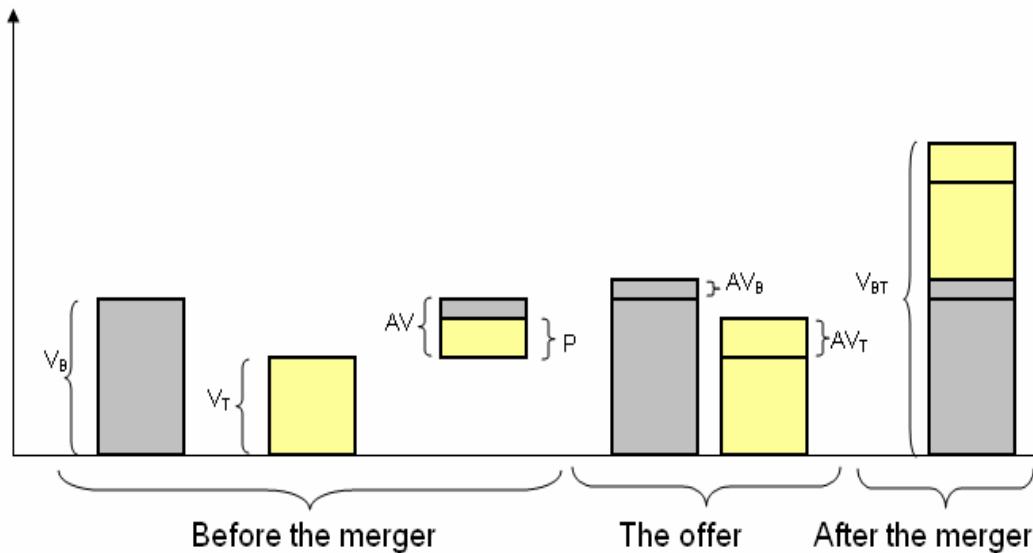
Therefore the bidder benefits only from the added value after the payment of the premium, which is the wealth given to the stockholders of the target.

$$AV_B = AV - P$$

$$AV_T = P$$



This is a very simple model, which does not consider, for example either the premium is paid in cash or in stocks, but we are not going into these matters. (graph 3-1)



graph 3-1 The value of the companies before and after the merger

Therefore, if we were the CEO of a company who is wondering about undertaking a merger, the main steps we would have to consider are:

1. Make a valuation of the target stand alone
2. Point out the main sources of added value
3. Estimate the added value
4. Estimate the minimum premium that the shareholders of the target are expected to accept
5. Undertake to merger if the added value is higher than that minimum premium

In this work we are going into details in analysing points 2 and 3, that is we will try to estimate, under certain hypothesis, the added value for the target, AD_T , for the bidder, AD_B , and combined, AD , as functions of some explanatory variables.

Now a new question arises: which are the proxies of the added value, or, when can we claim that a merger is successful? In the next paragraph we will try to give an answer.



3.1.2 Measuring the outcome of mergers

According to Jyrki Ali-Yrkkö (Ali-Yrkkö 2002), based on different indicators, the studies of post-acquisition performance can be categorised into three classes.

- A. In the first category, performance has been measured by share price
- B. In the second class accounting measures of profitability have been used
- C. The third class includes studies in which other measures of merger success have been utilised.
 - a) Adopting the first method, we basically suppose that the market values represent properly the companies values, therefore when a merger is announced, the market immediately incorporates the added values into the stock prices. The main technique which is used to estimate the added value is the *event study*. In the following paragraph we will give a pretty deep explanation of this method.
 - b) According to the second method a good proxy of the added value is the post-merger profitability. The impact of M&A on operating performance is measured by comparing accounting measures of profitability before and after the M&A and benchmarking these values to the industry average.

Usually, profitability is measured as the profit related to sales or as the return on assets.

The main problems with this method are:

- the period to consider
- the goodness of the balance sheet data

Usually a merger brings consequences in the long run and it may take years before a real managerial merger is finalised. Therefore, we should take into account the balance sheets up to many years after the announcement of the merger and this could make it impossible to isolate the effects of the merger from all the other factors which influence the profitability indexes.

Secondly, at least in the short run, some indexes could be influenced by arbitrary decisions of the management, who could adopt particular accounting or managerial techniques to get better or worse results. Moreover not always by improving some balance sheet indexes you add value to a



firm. A common phenomenon related to this argument is called *bootstrap*. Let's see the example described by Brealey (Brealey, Myers 2003), that is the acquisition of Muck and Slurry by World Enterprise.

In Table 3-1 some figures before the takeover are illustrated:

	World Enterprise		Muck and Slurry	
EPS	USD	2,00	USD	2,00
Stock price	USD	40,00	USD	20,00
Price on earnings		20		10
Number of shares		100.000		100.000
Earnings	USD	200.000	USD	200.000
Market Value	USD	4.000.000	USD	2.000.000
Return on investment		5,0%		10,0%

Table 3-1 Example of bootstrap

Muck and Slurry has a negative growth prospective, in fact its P/E is half of the one of the World Enterprise.

To acquire the 100.000 stocks of the MS, the WE can offer half of its stocks, as their price is double, so, after the deal, the stocks of the WE will be 150.000

Let's suppose that the added value is 0, so the market value of the company after the value is exactly the sum of the values before the takeover; the same occurs to the earnings.

The EPS is given by the ratio of the earnings to the number of shares, that is $400.000/150.000=2.67$ USD/stock. It has increased! (Table 3-2)

	WE after the deal	
EPS	USD	2,67
Stock price	USD	40,00
Price on earnings		15
Number of shares		150000
Earnings	USD	400.000
	USD	
Market Value	6.000.000	
Return on investment		6,7%

Table 3-2 Indexes of the company after the merger

This example shows that you can enhance the profitability indexes without creating value!



c) Other possible outcomes to analyse are: the impact on the competition in the industry, the effect on the employment, on the offer of loans, on the value added to the society and so on (see e.g. FinMonitor 2003).

Our work will focus on point a. Therefore, what do we mean by value? In the following paragraph we will examine this concept.

3.1.3 The shareholders value

There are several approaches to estimate the value of the equity of a company in a certain time t . We will adopt the discounted profit method, therefore the value of the equity of a certain company at time t_0 is given by:

$$W_{equity_t_0} = \sum_{\tau=t_0}^{\infty} \frac{E_{\tau}}{(1+k_E)^{\tau}}$$

Where E is the expected earning at time τ and k_E is the cost of the equity. The latter, according to the *Capital Asset Pricing Model*, is given by:

$$k_E = r_f + \beta(r_M - r_f)$$

r_f is the return of the risk free bonds, r_M is the return of the index representing the market and β is the systematic risk of the company.

3.1.4 The sources of value creation

As a consequence of the definition of value, to put it a simple way, there are three basic ways to increase the shareholders value of a company:

1. Boosting the revenues without making the costs increase by the same amount
2. Bringing down the costs without making the revenues decrease by the same amount
3. Lowering the systematic risk of the company



3.1.4.1 How can revenues increase?

In general, the revenues are given by:

$$R = \sum_{i=1}^N p_i q_i(p)$$

If a company is managing a product portfolio made up by N products, its revenues will be given by the sum of the revenues generated by each product, that is its price times the quantity sold.

Therefore, there are three paths to boost the revenues:

- A. Raising the price, without causing a proportional decreasing of the quantity sold
- B. Extending the product portfolio
- C. Enhancing the quantity sold

We are going to analyse now how a merger could affect the value in one of the three ways mentioned above.

a) The first, more obvious, impact of a merger is the increase of the dimension of the company. If we are considering a horizontal merger, that is a company acquiring one of its competitors, the increase in the dimension brings an increase in the market share as well. According to the basic microeconomic theories, one of the consequences of an increasing market share is a growth in the bargaining power and, thereby the possibility to set a higher price to the customers.

The best way to measure the increasing bargaining power would be to calculate the change in the market share. Unfortunately our dataset does not provide us with this kind of information, so a good proxy of the phenomenon we are evaluating could be the relative total asset, that is the ratio of the total asset of the bidder to the total asset of the target.

$$x_{1,i} = \frac{\text{Total_asset_bidder}_i}{\text{Total_asset_target}_i}$$



The index i indicates the i -th transaction. Of course the balance sheet data are not available daily, thereby our variable will take into account the data provided by the last annual report before the announcement of the merger.

Usually we do not look only at the present dimension of the target, but as well its growth rate plays an important role. By acquiring a company which is growing at a very high rate you expect the merged company possibly to grow fast as well. So, we consider a second variable which is the percentage change in the total asset of the target in the two fiscal years which precede the announcement.

$$x_{2,i} = \frac{\text{Total_asset_t arg et}_{i,\text{fiscal_year_n}} - \text{Total_asset_t arg et}_{i,\text{fiscal_year_n-1}}}{\text{Total_asset_t arg et}_{i,\text{fiscal_year_n-1}}}$$

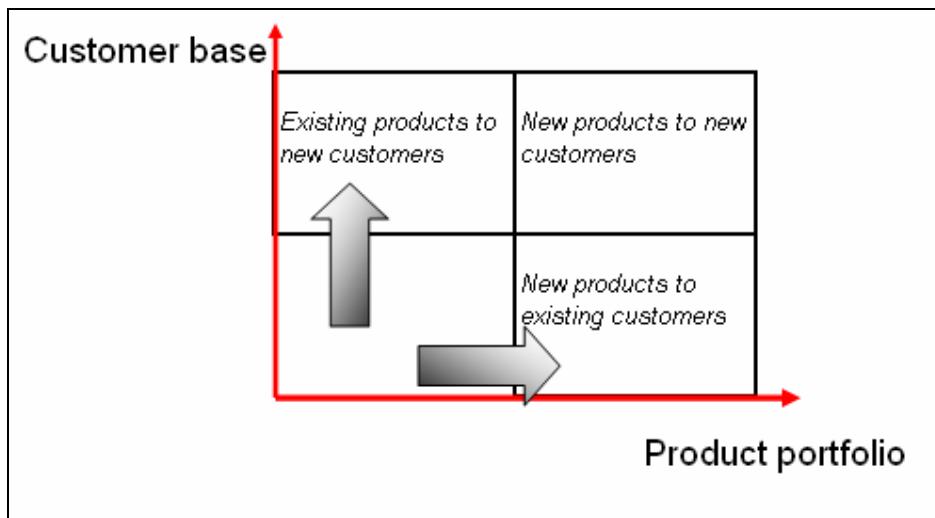
- b) A second reason that could lead the management of a company to merge is the possibility to offer its own products to the customers of the target, that is, extending the customer base and the quantity sold, exploiting synergies given to the fact that it could avoid the investments in research and development, engineering, production and, partially, in marketing, especially if it has developed a strong brand.
- c) A further way to boost the revenues is to offer the products of the target to the existing customers of the bidder, that is extending the product portfolio.

As a consequence, thanks to the merger the revenues of the merged company, in both cases, could be in general higher than the sum of the two revenues before the merger. (graph 3-2).

If one goes back to the definition of value, he could state that there would not be any increase in shareholders value if costs increased by the same amount. Well, possibly this does not occur, according to the *economies of scopes*, that is an economic theory stating that the average total cost of production decreases as a result of increasing the number of different goods produced.

For example, McDonalds can produce both hamburgers and French fries at a lower average cost than what it would cost two separate firms to produce the same goods. This is because McDonald's hamburgers and French fries share the use of food storage, preparation facilities, and so forth during production and share the same marketing efforts.





graph 3-2 The diversification paths

Another example is a company such as Proctor & Gamble, which produces hundreds of products from razors to toothpaste. They can afford to hire expensive graphic designers and marketing experts who will use their skills across the product lines. Because the costs are spread out, this lowers the average total cost of production for each product.

Let's imagine that tomorrow we will go, as every week, to our bank to withdraw some cash or to check our investment. After a long queue, it's our turn; we have a chat with the guy who is in the office, a guy we really trust because has been giving our family important advice about how to invest our money for so many years. He tells us that there is a good news, a great novelty about the services offered by the bank. They have just acquired an insurance company, so they can offer us new life or property insurance products whose quality and convenience are guaranteed by him. Don't you think it is very likely that we will trust that guy and buy the new products, or at least we would be influenced by him? Well, this is a clear example of economies of scope in the financial industry.

Now, we need some variables which estimate the potential of economies of scope for the merger. We will group these variables into three classes: portfolio, geography and market.



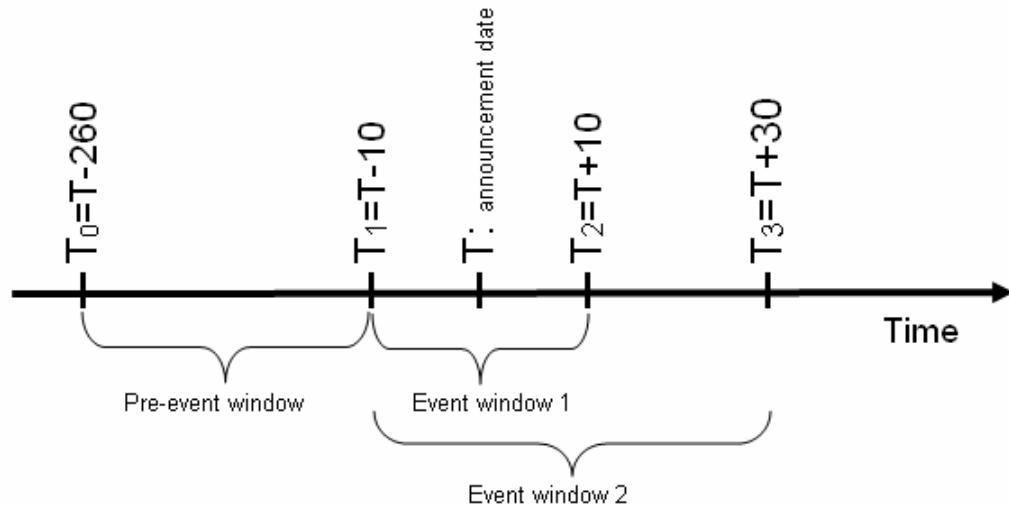
Portfolio diversification

The first one we have set is the *portfolio distance*. Before entering into details we need to define some basic concepts.

First of all, we need to define some time variables that will be very useful when we will be speaking about event study.

We call T the day in which the merger is officially announced. We define three periods, which only consider the days in which the stock exchange is opened:

- *Pre event window*: which starts 260 days before the announcement and ends 10 days before, therefore it lasts 250 days, that is, more or less, a fiscal year. It is used to estimate several parameters which give information about the *normal* performance of the company.
- *Event window 1*: which lasts 20 days and is used to estimate the reaction of the parameters of the company to the announcement. It starts 10 days before the official announcement because the market, especially if little efficient, may be aware of some news before the official announcement.
- *Event window 2*: it is an extension of the event window 2 and includes 20 days more. It is used to estimate the reaction of the market in a longer run. (graph 3-3)



graph 3-3 The temporal windows

To define the portfolio distance variable, we only need to consider the pre-event window.



Let RI_t^q the return index at time t of the company involved in the transaction i and let q indicate either the company is a target or a bidder. Here's the definition of return index as given by *DataStream*, our principal source.

A return index (RI) is available for individual equities and unit trusts. This shows a theoretical growth in value of a share holding over a specified period, assuming that dividends are reinvested to purchase additional units of an equity or unit trust at the closing price applicable on the ex-dividend date. For unit trusts, the closing bid price is used.

From 1988 onwards (and from 1973 for US and Canadian stocks), the availability of detailed dividend payment data enables a more realistic method to be used in which the discrete quantity of dividend paid is added to the price on the ex-date of the payment. Then:

$$RI_t = RI_{t-1} * \frac{P_t}{P_{t-1}}$$

except when $t = \text{ex-date of the dividend payment } D_t$ then:

$$RI_t = RI_{t-1} * \left(\frac{P_t + D_t}{P_{t-1}} \right)$$

Where P_t = price on ex-date

P_{t-1} = price on previous day

D_t = dividend payment associated with ex-date t

Gross dividends are used where available and the calculation ignores tax and re-investment charges. Adjusted closing prices are used throughout to determine price index and hence return index.

RIs for new issues will initially be based on an anticipated annualised dividend until data on the first actual dividend payment becomes available. At this point the RI is calculated back to the base date.

Let I_{ijk} be the *price index* at time t of the index j of the stock market k . Let's start with the definition of price index given by *DataStream*, later we will describe which indexes we have considered.



DataStream calculates its own aggregate sector and market price indices, together with associated aggregations such as sector price/earnings ratio (PE) and dividend yield (DY).

Sector and market aggregations are weighted by market value and are calculated using a representative list of shares. For full details of sector lists, and how to display the constituents of a sector list, see DataStream Global Indices.

The index is calculated as follows:

$I_0 = \text{index value at base date} = 100$

$I_t = \frac{\sum (P_t * N_t)}{\sum (P_{t-1} * N_t * f)}$

Where $I_t = \text{index value at day } t$

$I_{t-1} = \text{index value on previous working day (of } t\text{)}$

$P_t = \text{unadjusted share price on day } t$

$P_{t-1} = \text{unadjusted share price on previous working day (of } t\text{)}$

$N_t = \text{number of shares in issue on day } t$

$f = \text{adjustment factor for a capital action occurring on day } t$

$n = \text{number of constituents in index}$

The summations are performed on the constituents as they exist on day t .

Dow Jones Indexes supplies for each stock market of the world a set of indexes classifies according to different industries and given in different degree of details (ICB, *Industry Classification Benchmarking*).

We considered indexes at level four of the industry *financial services*. As showed in Table 3-3, there are 15 different indexes.



LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Financials	Banks	Banks	Banks
	Insurance	Nonlife Insurance	Full Line Insurance Insurance Brokers Property & Casualty Insurance Reinsurance
		Life Insurance	Life Insurance
	Financial Services	Real Estate	Real Estate Holding & Development Real Estate Investment Trusts
		General Financial	Asset Managers Consumer Finance Specialty Finance Investment Services Mortgage Finance
		Equity Investment Instruments	Equity Investment Instruments
	Nonequity Investment Instruments		Nonequity Investment Instruments

Table 3-3 The indexes of the financial industry as defined by Dow Jones Indexes

We define now the relative change of price index and total return index:

$$r_{ti}^q = \frac{RI_{ti}^q - RI_{t-1,i}^q}{RI_{t-1,i}^q}$$

$$i_{ijk} = \frac{I_{ijk} - I_{t-1,jk}}{I_{t-1,jk}}$$

We need now the average and the standard deviation of both variables in the pre-event period, and the covariance:

$$\hat{r}_i^q = \sum_{\tau=T_i-260}^{T_i-11} \frac{r_{\tau}^q}{250}$$



$$\sigma(r_i^q) = \sqrt{\sum_{\tau=T_i-260}^{T_i-11} \frac{(\hat{r}_i^q - r_{\bar{a}}^q)^2}{250}}$$

$$\hat{i}_{jki} = \sum_{\tau=T_i-260}^{T_i-11} \frac{i_{\bar{a}jk}}{250}$$

$$\sigma(i_{jki}) = \sqrt{\sum_{\tau=T_i-260}^{T_i-11} \frac{(\hat{i}_{jki} - i_{\bar{a}jk})^2}{250}}$$

$$\sigma(r_i^q, i_{jki}) = \sum_{\tau=T_i-260}^{T_i-11} \frac{(\hat{i}_{jki} - i_{\bar{a}jk})(\hat{r}_i^q - r_{\bar{a}}^q)}{250}$$

We calculate now the correlation of the returns of the companies involved in the transaction i which each of the 15 financial indexes of its stock market.

$$\rho_{ij}^q = \frac{\sigma(r_i^q, i_{jki})}{\sigma(r_i^q)\sigma(i_{jki})}$$

As a result both for the bidder and for the target we get its correlations with the 15 indexes: a high correlation indicates that that company is involved in that sub industry.

We measure the portfolio distance as follow:

$$x_{3i} = \sum_{j=1}^{15} \frac{|\rho_{ij}^B - \rho_{ij}^T|}{15}$$

Of course $0 \leq x_{2i} \leq 2$: a value close to 0 indicates that the two companies are involved in the same sub industries, so the distance between the portfolios is low so the potential for economies of scope is low and they will probably benefit from economies of scale.

An example will clarify the meaning of this variable.



Let's consider the merger between two great American bank insurances: Lincoln National Corp and Jefferson-Pilot Corp, announced on October, 10th 2005.

The correlations are illustrated in Table 3-4:

CORRELATIONS	FINANCIAL INDUSTRY	ASSET MANAGERS	BANKS	DIV INDS	FIN ADMIN	FULL LIN INSUR	INSUR BROKERS	INVESTMENT SVS	LIFE INSURANCE	REINSURANCE	RE INVEST TRUST	SPECIALITY FIN	MORTGAGE FIN	GENERAL FIN	NONLIFE INSUR	REAL ESTATE
Target	71,04%	62,36%	64,62%	54,39%	47,82%	43,73%	41,24%	55,11%	78,95%	45,68%	49,76%	65,35%	51,96%	61,87%	60,44%	43,14%
Bidder	63,70%	57,04%	57,98%	49,78%	40,67%	44,66%	34,83%	54,30%	72,80%	40,50%	39,64%	51,70%	33,72%	54,55%	57,43%	32,87%
Difference		5,32%	6,64%	4,61%	7,14%	0,93%	6,41%	0,80%	6,15%	5,18%	10,12%	13,65%	18,23%	7,32%	3,01%	10,27%

Table 3-4 Table of correlation between the companies' returns and the indexes

It is clear that both companies operates mostly in the life insurance sub industry, moreover we notice that the correlations are more or less the same for each sub industry, in fact the portfolio distance is 7.05%, therefore there is very little potential for economies of scope.

A second variable which may give information about the degree of diversification achieved through the merger is a dummy which equals 1 if the two companies belong to the same industry, 0 if they don't.

Thomson Financial, which our source of data about the transactions, put each company classified as financial into seven sub industries, namely:

- Commercial Banks, Bank Holding Companies
- Savings and Loans, Mutual Savings Banks
- Credit Institutions
- Real Estate; Mortgage Bankers and Brokers
- Investment & Commodity Firms/Dealers/Exch.
- Insurance
- Other Financial

Therefore,

$$x_{4i} \in \{0;1\}$$



Market diversification

If two companies operate in the same business, it is very likely that their market stock returns are very correlated. Therefore, our next variable is the correlation between the stock returns of bidder and target during the pre-event window. The higher this variable, the lower is the potential for economies of scope.

$$x_{5i} = \rho_i = \frac{\sigma(\hat{r}_i^T, \hat{r}_i^B)}{\sigma(\hat{r}_i^T)\sigma(\hat{r}_i^B)}$$

Geographic diversification

A third path towards diversification is entering a new geographic market. The first, simple, indicator which suggests either the merger may have this scope is a dummy which equals 1 if the transaction is cross border, otherwise 0.

$$x_{6i} \in \{0;1\}$$

This kind of information may be sometimes pretty trivial. For example, it would equal 1 both for a merger between a French and an Italian bank and for a merger between a French and a Chinese bank. Does it make sense? Do we think the potential for economies of scope is the same in both cases? Of course not. As a consequence, we introduce some more variables which inform about the distance between the country of the bidder and the country of the target in various fields.

To meet this need we collected a list of indicators of each country in the world for the last 6 years. They are grouped in different categories (Table 3-5).

Taking the data listed above for the country of the bidder and the country of the target we calculated the following measures of distance between them (Table 3-6).



Legal framework	<i>Financial legal system</i>	Bank regulation	Banking regulation does not hinder competitiveness in your economy (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
		Financial institution transparency	Financial institutions' transparency is sufficiently implemented in your economy (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
	<i>General legal system</i>	Legal quality	The legal and regulatory framework encourages the competitiveness of enterprises (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
		Regulation intensity	Regulation intensity does not restrain the ability of companies to compete (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
Political framework		Central bank transparency	Central bank policy of your economy has a positive impact on economic development (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
		Risk of political instability	The risk of political instability in your economy is very low (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
		Transparency of the government	(Transparency of government policy is satisfactory) (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
Macro economical framework	<i>Financial system</i>	Banking sector assets	% GDP (International Financial Statistics September 2005 (IMF))
		Credit flow	Credit flows easily from banks to businesses (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
		Efficiency of the banking system	Banking and financial services in your economy do support business activities efficiently (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
		Gross Dom. Saving Pro cap.	(US\$ per capita) (national sources)
		Gross Domestic Saving (%GDP)	(National sources)
		Gross Domestic Saving - Real growth	(Percentage change, based on national currency in constant prices) (National sources)
		Interest rate spread	Lending rate minus deposit rate (National sources)
	<i>General economics</i>	Exchange rate stability	Parity change from national currency to SDR, 2004/2002 (International Financial Statistics March 2005 (IMF))
		GDP (PPP)	(Estimates; US\$ billions at purchasing power parity) (World Bank)
		GDP (PPP) Pro capita	(Estimates; US\$ per capita at purchasing power parity) (World Bank)
		GDP Real growth	Percentage change, based on national currency in constant prices (Main Economic Indicators October 2005 (OECD))
Cultural framework		Bribing and corruption	Bribing and corruption do not exist in the economy (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
		Credibility of the manager	Credibility of managers is widely acknowledged in the economy (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
		Language skills	Language skills are meeting the needs of enterprises (IMD WCY Executive Opinion Survey based on an index from 0 to 10)
Geographic framework		Density of population	(inhab/km2) http://en.wikipedia.org/wiki/List_of_countries_by_population_density
Fiscal framework		Real corporate taxes	Real corporate taxes do not discourage entrepreneurial activity (IMD WCY Executive Opinion Survey based on an index from 0 to 10)

Table 3-5 The country variables

Cultural distance	X_{i7}
Financial system distance	X_{i8}
Economic distance	X_{i9}
Political distance	X_{i10}
Financial legal system distance	X_{i11}
General legal distance	X_{i12}
Fiscal distance	X_{i13}

Table 3-6 The measures of distances

Here are the steps we followed to calculate each of the variables listed above:

- for each year and for each country variable, we standardized the values
- for each transaction we took the standardized country values of the countries of the bidder and of the target in the year when the transaction was announced
- for each group of variables (cultural, financial system etc...) we calculated the average value for both the country of the bidder and the one of the country
- the distance is the difference between these two values

Let's give an example: we want to calculate the financial legal system distance of the merger between Unicredito Italiano Spa (Italy) and Pioneer Group Inc (USA) announced on the 15th of May 2000.

We need two country variables: bank regulation and financial institutions' transparency considered in the year 2000.

The average value of the standardised values for Italy is $(-1.05-0.97)/2 = -1$; for USA $(1.19+1.50)/2=1.35$

The financial legal system distance is $| -1 - 1.35 | = 2.35$

Of course the fact that the potential for economies of scope or diversification is high does not mean, necessarily, that revenues increase, something is still to be considered. Let's imagine that a bank of the USA wants to merge with an insurance company in Somalia. The portfolio distance would be very high, the industry would not be the same, the transaction would be cross border and the country distances very high. Therefore, if we didn't take into account more factors, we would conclude that there is a very high probability that economies of scope will appear and the American company will sell its products to the Somalian customers and



will propose to its existing customers the insurance products of the target. Well, it is obvious that this would not be the case!

We need some indicators which tell us if the new customers are ready to pay for the products of the bidder and if the target has got products good enough to be submitted to the existing customers of the bidder.

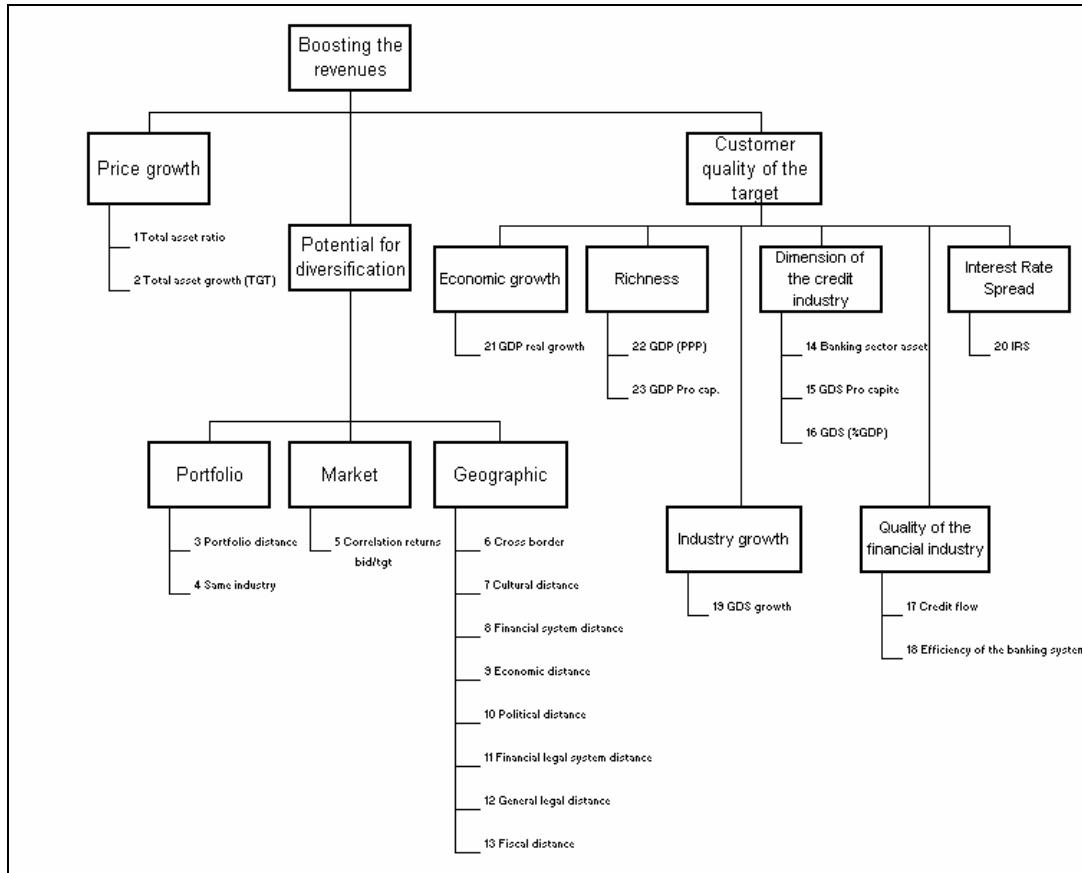
Macro economical framework	Financial system	Banking sector assets	% GDP (International Financial Statistics September 2005 (IMF))	X _{i14}	The bigger the dimension of the banking industry, the better are supposed to be the customers
		Gross Dom. Saving Pro cap.	(US\$ per capita) (national sources)	X _{i15}	
		Gross Domestic Saving (%GDP)	(National sources)	X _{i16}	
		Credit flow	Credit flows easily from banks to businesses (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X _{i17}	A good banking and credit system indicates the presence of good potential customers
		Efficiency of the banking system	Banking and financial services in your economy do support business activities efficiently (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X _{i18}	
		Gross Domestic Saving - Real growth	(Percentage change, based on national currency in constant prices) (National sources)	X _{i19}	A country in which the tendency to save is growing could be a good opportunity for a bidder
		Interest rate spread	Lending rate minus deposit rate (National sources)	X _{i20}	There is a good potential margin for interest income
	General economics	GDP Real growth	Percentage change, based on national currency in constant prices (Main Economic Indicators October 2005 (OECD))	X _{i21}	A fast growing country could represent a strategic opportunity
		GDP (PPP)	(Estimates; US\$ billions at purchasing power parity) (World Bank)	X _{i22}	The higher these indicators, the richer are expected to be the customers
		GDP (PPP) Pro capita	(Estimates; US\$ per capita at purchasing power parity) (World Bank)	X _{i23}	

Unfortunately we don't have information about the quality of the customers of the single companies, so we will use some indicators of the country of the target which describe its financial system and its macroeconomic condition. Of course for each transaction we will take the indicator related to the year when the transaction is announced.

graph 3-4 sums up what said so far.

So, after this analysis, we have identified 23 variables which suggest either there is a chance for the companies to boost the revenues. Let's consider the cost side now.





graph 3-4 Sources of revenues growth

3.1.4.2 How can costs decrease?

Let's suppose we have been customers for a very long time of bank A. Its offices are situated exactly in front of the offices of another bank, bank B. This bank announces a tender offer for the stocks of bank A, and it succeeds acquiring it in order to undergo a merger. Well, it is likely that the first time we go to our bank, the employee will inform us that that office is going to close soon and we are suggested to go to the offices of bank B. Possibly we will do that. So, what has occurred?

One of the most important reason which drive managers to arrange a merger is the possibility of cut down fix costs without decreasing the volume of the output. Bank B, possibly, will not lose the old customers of bank A, but for sure by shutting down some duplicated offices, it will benefit



from a sharp drop in fix costs (administrative, information systems, renting etc...). We call these phenomena *synergies*, or with a more technical approach, *economies of scale*.

Let's give a deeper definition of economies of scale.

When more units of a good or a service can be produced on a larger scale, yet with (on average) less input costs, economies of scale are said to be achieved (Heakal 2003). Alternatively, this means that as a company grows and production units increase, a company will have a better chance to decrease its costs. According to theory, economic growth may be achieved when economies of scale are realized.

Adam Smith identified the division of labour and specialization as the two key means to achieve a larger return on production. Through these two techniques, employees would not only be able to concentrate on a specific task, but with time, improve the skills necessary to perform their jobs. The tasks could then be performed better and faster. Hence, through such efficiency, time and money could be saved while production levels increased.

Just like there are economies of scale, diseconomies of scale also exist. This occurs when production is less than in proportion to inputs. What this means is that there are inefficiencies within the firm or industry resulting in rising average costs.

Alfred Marshall made a distinction between internal and external economies of scale. When a company reduces costs and increases production, internal economies of scale have been achieved. External economies of scale occur outside of a firm, within an industry. Thus, when an industry's scope of operations expands due to, for example, the creation of a better transportation network, resulting in a subsequent decrease in cost for a company working within that industry, external economies of scale are said to have been achieved. With external ES, all firms within the industry will benefit.

In addition to specialization and the division of labour, within any company there are various inputs that may result in the production of a good and/or service.

- **Lower input costs:** when a company buys inputs in bulk - for example, potatoes used to make French fries at a fast food chain - it can take advantage of volume discounts. (In



turn, the farmer who sold the potatoes could also be achieving ES if the farm has lowered its average input costs through, for example, buying fertilizer in bulk at a volume discount.)

- **Costly inputs:** some inputs, such as research and development, advertising, managerial expertise and skilled labour are expensive, but because of the possibility of increased efficiency with such inputs, they can lead to a decrease in the average cost of production and selling. If a company is able to spread the cost of such inputs over an increase in its production units, ES can be realized. Thus, if the fast food chain chooses to spend more money on technology to eventually increase efficiency by lowering the average cost of hamburger assembly, it would also have to increase the number of hamburgers it produces a year in order to cover the increased technology expenditure.
- **Specialized inputs:** as the scale of production of a company increases, a company can employ the use of specialized labour and machinery resulting in greater efficiency. This is because workers would be better qualified for a specific job - for example, someone who only makes French fries - and would no longer be spending extra time learning to do work not within their specialization (making hamburgers or taking a customer's order). Machinery, such as a dedicated French fry maker, would also have a longer life as it would not have to be over and/or improperly used.
- **Techniques and Organizational inputs:** with a larger scale of production, a company may also apply better organizational skills to its resources, such as a clear-cut chain of command, while improving its techniques for production and distribution. Thus, behind the counter employees at the fast food chain may be organized according to those taking in-house orders and those dedicated to drive-thru customers.
- **Learning inputs:** similar to improved organization and technique, with time, the learning processes related to production, selling and distribution can result in improved efficiency - practice makes perfect!

External economies of scale can also be realized from the above-mentioned inputs as a result of the company's geographical location. Thus all fast food chains located in the same area of a certain city could benefit from lower transportation costs and a skilled labour force. Moreover, support industries may then begin to develop, such as dedicated fast food potato and/or cattle breeding farms.

External economies of scale can also be reaped if the industry lessens the burdens of costly inputs,



by sharing technology or managerial expertise, for example. This spill over effect can lead to the creation of standards within an industry.

We will analyse three categories of explanatory variables: dimensions, overlaps, relative efficiency and regulation.

Dimensions

We expect that acquiring a relative big or fast growing target, the potential for economies of scale is higher. Therefore the variables introduced to explain the increase in revenues have to be taken into account for the costs reduction as well.

$$x_{1,i} = \frac{\text{Total_asset_bidder}_i}{\text{Total_asset_target}_i}$$

$$x_{2,i} = \frac{\text{Total_asset_target}_{i,\text{fiscal_year_n}} - \text{Total_asset_target}_{i,\text{fiscal_year_n-1}}}{\text{Total_asset_target}_{i,\text{fiscal_year_n-1}}}$$

Overlaps

Let's go back to the example of banks A and B. Suppose that the bidder, bank B, is not a bank, but an insurance company. Moreover it is not American, as bank A, but Russian, therefore its culture, language, legal system and so on are totally different from bank A. First, do you think it would convenient and cheap for B to shut down the offices of bank A? Second are you still willing to shift, without thinking twice, to the offices of B? It seems that for both cases the answer is no.

Therefore, the potential for synergies and economies of scale is expected to be high when there is a large overlap between their product portfolio, their culture, their language, their organization and so on. It sounds natural to take back the variables of distances introduced in the paragraph dedicated to the revenues. Of course those variables were expected to impact in a positive way if we consider the revenues, but negative from the synergies point of view.



$$x_{3i} = \sum_{j=1}^{15} \frac{|\rho_{ij}^B - \rho_{ij}^T|}{15} \text{ (portfolio distance)}$$

$$x_{4i} \in \{0;1\} \text{ (1=same industry, 0 otherwise)}$$

$$x_{5i} = \rho_i = \frac{\sigma(\hat{r}_i^T, \hat{r}_i^B)}{\sigma(\hat{r}_i^T)\sigma(\hat{r}_i^B)} \text{ (correlations of the returns bid/tgt)}$$

$$x_{6i} \in \{0;1\} \text{ (1=cross border, 0=domestic)}$$

Cultural distance	x_{i7}
Financial system distance	x_{i8}
Economic distance	x_{i9}
Political distance	x_{i10}
Financial legal system distance	x_{i11}
General legal distance	x_{i12}
Fiscal distance	x_{i13}

Relative efficiency

Let's go back again to our example. Suppose that the target, bank A, has got a very bad information system. The most of the processes have to be managed manually, so a lot of employees are needed. On the other hand, bank B is adopting the latest version of an ERP which makes it possible to manage all the activities automatically. It is evident that in this case the potential for cost savings is very high. We mean that the higher the relative efficiency of the bidder with respect to the target, the higher is expected to be the cost saving potential.

The problem arising now is: how can we measure the efficiency of a bank? To give an acceptable answer to this question we would need an whole thesis.

So, we will use the general and commonly used indicator of efficiency for the banking industry, that is the *cost-on-income ratio*. (*CIR*).

$$CIR = \frac{\text{operating_costs}}{\text{total_income}}$$



The CIR is an efficiency measure similar to operating margin (although unlike the operating margin lower is better), most commonly used in the financial sector.

It is useful to measure how costs are changing compared to income, for example if a bank's interest income is rising but costs are rising at a higher rate looking at changes in this ratio will highlight the fact.

However some critics have been moved forward against the use of the CIR. According to Silvano Carletti (Carletti 2003) there are at least three reasons why CIR is a weak indicator:

1. The CIR is widely influenced by the product portfolio: for example the activity of retail banking brings a lower CIR than the activity of asset management.
2. The CIR does not explain different cost functions.
3. The CIR does not explain the efficiency in exploiting the capital invested, that is, the correlation between CIR and ROA is pretty low.

Nevertheless our database does not provide us with better indicators, so we will estimate the relative efficiency of the bidder as the ratio between the CIR of the bidder and the CIR of the target, as usual the values are taken from the latest annual report before the announcement of the merger.

$$x_{i24} = \frac{CIR_{BIDDER,i}}{CIR_{TARGET,i}}$$

Usually one of the things that occur after a merger is the reduction of the number of employees. Then we add a further indicator which inform us about the efficiency in the labour force management.

$$labor_cost_ratio = \frac{wages_and_salaries}{total_income}$$

$$x_{i25} = \frac{labor_cost_ratio_{BIDDER,i}}{labor_cost_ratio_{TARGET,i}}$$



Regulation

Imagine an American bank is wondering either acquiring an other American bank or an Italian one. In addition to all the considerations discussed above, which other aspects should be taken in account? If we go back to the example introduced at the beginning of this paragraph, if the merger had taken place in the States, bank A would be shut down without many problems. On the contrary, if bank B had been Italian, a strong and severe regulation framework, especially in the labour field, would make it difficult for the bidder to close bank B and benefit from synergies. Moreover in a deeply regulated market there is less room for the manager to cut down costs or come up with new managerial innovations.

To check the regulatory intensity of the country of the target, we take into account the following variables:

Bank regulation	Banking regulation does not hinder competitiveness in your economy (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i26}	A high value indicates that the country benefits from a not severe regulation, therefore there is a higher potential for cost cutting
Regulation intensity	Regulation intensity does not restrain the ability of companies to compete (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i27}	

A very important cost of every company is represented by the taxes. One of the main reasons of a merger is tax cutting. The reasons why taxes could drop are various and very difficult to capture with numerical indicators. For this reason we will only consider as an indicator, the level of corporate taxation of the country of the target. We expect to be more cost saving the mergers which take place in countries with a low corporate taxation.

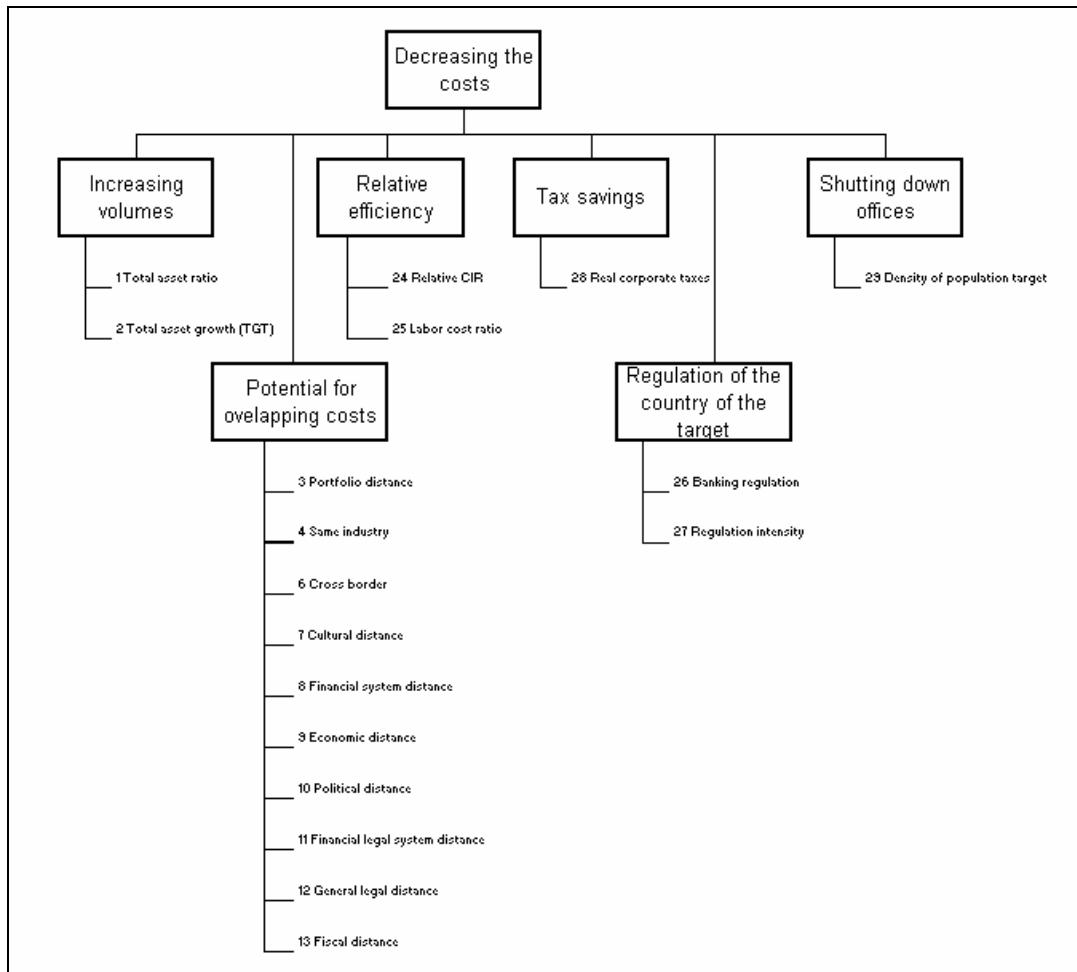
Real corporate taxes	Real corporate taxes do not discourage entrepreneurial activity (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i28}
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Finally, as showed by DeLong (DeLong 2001), the proximity of the financial companies to their customers plays an important role. It is very expensive for a bank to reach customers in a country in which the population is very spread. So we introduce an indicator of density of population of the country of the target:

Density of population	(inhab/km ²) http://en.wikipedia.org/wiki/List_of_countries_by_population_density	X_{i29}
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See graph 3-5 for a resume.



graph 3-5 The sources of cost decrease

3.1.4.3 How can risk decrease?

A huge amount of papers have been written about the risk management for financial institutions. Of course it is out of our scope to examine this field of study. More simply, we will try to identify the kinds of risks that may decrease thanks to a merger or arise from it. We distinguish two main categories: risks connected to the characteristics of the target and risks related to the transaction.



Target risks

There are some structural characteristics of the target and/or of its country that represent a risk for the bidder or on the other hand an opportunity to decrease its risk. Let's begin with risks of the company.

The first one is the *market stock price risk*. From this point of view, the shareholders of the bidder may be seen as owners of a portfolio including the stocks of the bidder and, potentially, the stocks of the target. Basically, the risk of the portfolio, which is expressed by the standard deviation of its value, decreases after including the stocks of the target if:

the correlation of the returns of the stocks of bidder and target is low

the standard deviation of the returns of the target is low

Moreover the higher is the correlation of the returns of the target with the industry index, the less the target is risky. As industry index we use the industry index provided by *Dow Jones Indexes*, level 2, financial industry.

Therefore we introduce three measures of the market risk:

$$x_{5i} = \rho_i = \frac{\sigma(\hat{r}_i^T, \hat{r}_i^B)}{\sigma(\hat{r}_i^T)\sigma(\hat{r}_i^B)}$$

$$x_{30i} = \sigma(\hat{r}_i^T)$$

$$x_{31i} = \rho^{TM}_i = \frac{\sigma(\hat{r}_i^T, \hat{r}_i^{INDEX})}{\sigma(\hat{r}_i^T)\sigma(\hat{r}_i^{INDEX})}$$

The second one is the *operative risk*. We said before that diversification can path the way to economies of scope and boost the revenues. Nevertheless diversification is risky from a managerial point of view. Starting to deal with markets or customers unknown may keep the company from its core business and create serious managerial problems. So we take again the indicators of industry diversification.

$$x_{3i} = \sum_{j=1}^{15} \frac{|\rho_{ij}^B - \rho_{ij}^T|}{15} \text{ (portfolio distance)}$$



$$x_{4i} \in \{0;1\} (1=\text{same industry}, 0 \text{ otherwise})$$

Moreover a good *ROA* of the target and the *ROA growth* in the last two fiscal years should indicate a good management quality, therefore the integration and the operative merger should be easier. However a very high change in the ROA could highlight as well an instability of the profitability if the target, which would pull the risk up. As a consequence it is difficult to forecast the real effect of the variable in the value creation process.

$$ROA = \frac{\text{operating - profit}}{\text{total - asset}}$$

$$ROA_growth = \frac{ROA_{i,n} - ROA_{i,n-1}}{ROA_{i,n-1}}$$

$$x_{i41} = ROA_i^T$$

$$x_{i42} = ROA_growth_i^T$$

The third one, which is typical of banks, is the risks of its loans, measured by the bad loans ratio, that is a percentage of the total loans. Unfortunately we do not have this data.

Among the risks related to the country of the target we identify two main categories: the cultural risks and the macroeconomic stability.

Here's the variables and a brief description:

Cultural risks	Bribing and corruption	Bribing and corruption do not exist in the economy (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i32}	A high level of corruption can make it difficult for the bidder to deal the operational merger
	Language skills	Language skills are meeting the needs of enterprises (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i33}	If the target has got bad language skills the operational merger may be longer and more problematic
Macroeconomic stability	Interest rate spread	Lending rate minus deposit rate (National sources)	X_{i20}	A country characterized by a fast growth can be less stable from a macroeconomic point of view. A high level of interest rate spread is often synonymous of developing country.
	Gross Domestic Saving - Real growth	(Percentage change, based on national currency in constant prices) (National sources)	X_{i19}	
	GDP Real growth	Percentage change, based on national currency in constant prices (Main Economic Indicators October 2005 (OECD))	X_{i21}	
	Exchange rate stability	Parity change from national currency to SDR, 2004/2002 (International Financial Statistics March 2005 (IMF))	X_{i34}	This indicator express the currency risk



Transaction risks

This category embodies the indicators that inform if the bidder will likely face problems and obstacles during the transaction. The presence of obstacles may render for the bidder more costly to undergo the merger and the results may not be what expected.

The first one is related to the dimension. It is obvious that it is more difficult to merge with a relative big company. So we take again the two indicators of dimension:

$$x_{1,i} = \frac{\text{Total_asset_bidder}_i}{\text{Total_asset_target}_i}$$

$$x_{2,i} = \frac{\text{Total_asset_target}_{i,\text{fiscal_year_n}} - \text{Total_asset_target}_{i,\text{fiscal_year_n-1}}}{\text{Total_asset_target}_{i,\text{fiscal_year_n-1}}}$$

The second one is related to the distances. Entering a new geographic market is risky, especially if the two countries are very different. Here's again the indicators of geographic distance.

$$x_{6i} \in \{0;1\} \quad (1=\text{cross border}, 0=\text{domestic})$$

Cultural distance	x _{i7}
Financial system distance	x _{i8}
Economic distance	x _{i9}
Political distance	x _{i10}
Financial legal system distance	x _{i11}
General legal distance	x _{i12}
Fiscal distance	x _{i13}

The third one is the attitude of the management of the target. A friendly transaction is possibly less costly, as in a hostile one the target may put obstacles and destroy values for both.

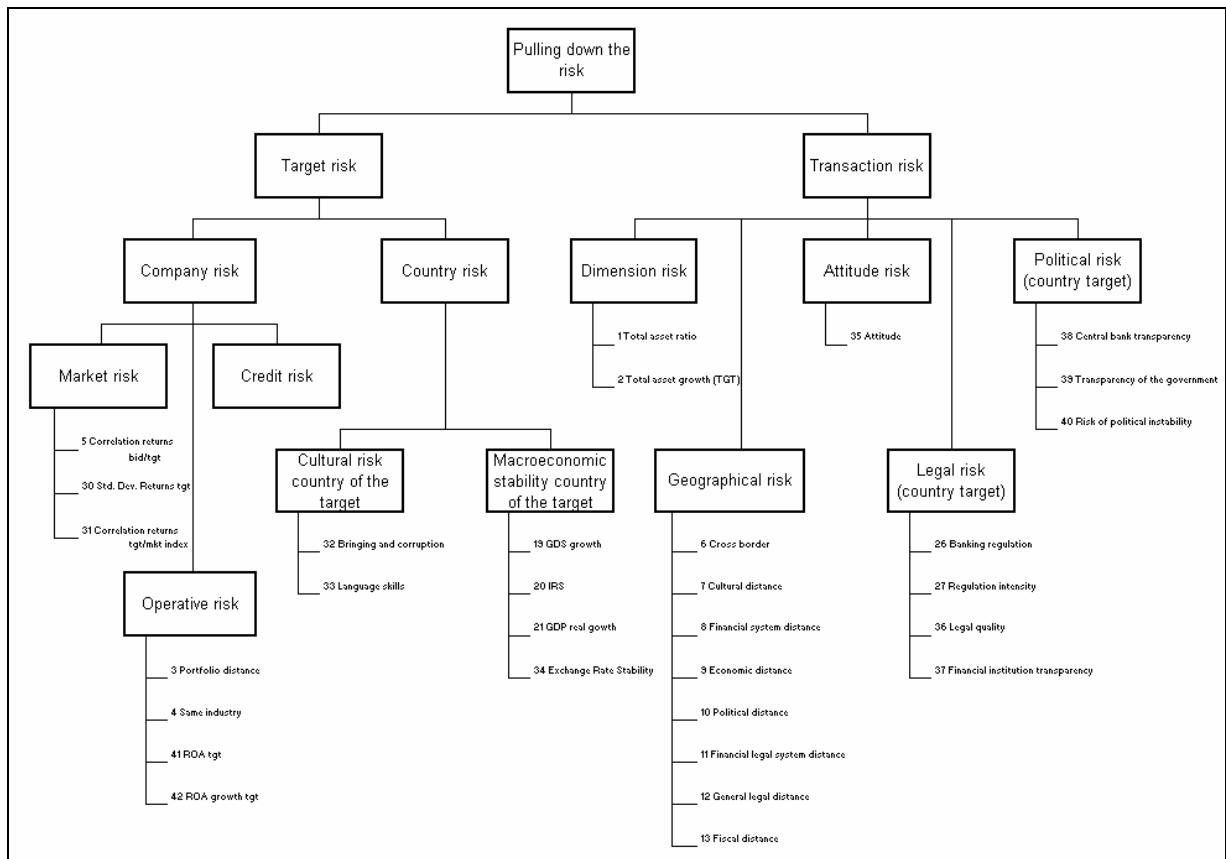
$$x_{35i} \in \{0;1\} \quad (1=\text{friendly}, 0=\text{hostile})$$

The fourth are related to the country legal and political characteristics. Here they are:



Legal risks	Bank regulation	Banking regulation does not hinder competitiveness in your economy (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i26}	A severe regulation may hinder competitiveness, however it decreases uncertainty and risks
	Regulation intensity	Regulation intensity does not restrain the ability of companies to compete (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i27}	
	Legal quality	The legal and regulatory framework encourages the competitiveness of enterprises (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i36}	A good legal system is expected to decrease the risk of the transaction
	Financial institution transparency	Financial institutions' transparency is sufficiently implemented in your economy (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i37}	
Political risks	Central bank transparency	Central bank policy of your economy has a positive impact on economic development (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i38}	The Central Bank or the other institutions may play an important role in accepting or obstacolating the transaction. Transparency decreases the risks.
	Transparency of the government	(Transparency of government policy is satisfactory) (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i39}	
	Risk of political instability	The risk of political instability in your economy is very low (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	X_{i40}	Similar to the previous one. In an unstable political contest risks are higher.

graph 3-6 resumes what said so far.



graph 3-6 Sources of risks decrease



2.1.4.4 Other sources of value creation

Up to now we have not taken into account at least two important aspects: how the bidder manages the payment and how the stock market sees the target. Let's start from the last one.

We argue that the market performance of a company with respect to its industry is the way the market gives its opinion about the management of the company. A bad performance indicates a bad managed company, therefore the bidder can replace the old management and bring its superior skills.

According to this view, managers compete for the right to manage the resources of company. Hence, poorly performing managers are threatened to become a victim of takeover (Jensen 1983). After takeover, the incumbent inefficient management team is replaced by value maximising managers. Hence, the acquirer assumes that economics gains can be achieved by replacing inefficient incumbent management with more efficient persons.

On the other hand, a bad market performance may be equivalent to an inefficient firm, so the integration process could be longer and more difficult.

We measure the market performance with two variables. The first one is *the price on book value* of the target, taken on the first day of the event window. It is defined as the market capitalization divided by the last book value available.

$$x_{i43} = \frac{\text{market_capit}_i}{\text{book_value}_i}$$

Basically, the market-to-book ratio attempts to identify undervalued or overvalued securities by comparing that ratio with the ones of the other companies in the same industry. A lower M/B ratio could mean that the stock is undervalued. However, it could also mean that something is fundamentally wrong with the company.

The second one is the relative performance of the target with respect to the market, that is the financial industry index (*Dow Jones Indexes*, level 2), calculated during the pre-event window.

Let

$$Q_{i,T-261}^{TGT} = 100 \text{ and } Q_{i,T-261}^{INDEX} = 100$$

and



$$\begin{aligned} Q_{i,t}^{TGT} &= r_{it}^{TGT} Q_{i,t-1}^{TGT} \\ Q_{i,t}^{INDEX} &= r_{it}^{INDEX} Q_{i,t-1}^{INDEX} \end{aligned}$$

for $T - 261 \leq t \leq T - 11$

where r_{it}^q is the stock return of q at time t related to the merger i .

We define

$$x_{i44} = \frac{Q_{i,T-11}^{TGT} - Q_{i,T-11}^{INDEX}}{100}$$

We measure as well the ability and the credibility of the management of the bidder through a country variable. As we will show later, it is not sufficient that the managers of a company which is willing to undergo a merger are good and clever, but as well credible towards the market, that is that they really follow their mission, that is to maximise the company they manage and not their own returns (principal-agent problem).

Credibility of the manager	Credibility of managers is widely acknowledged in the economy (IMD WCY Executive Opinion Survey based on an index from 0 to 10)	x_{i45}
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The second aspect to be considered is either the payment is in cash or stocks.

Harris, Franks & Mayer (1987) studied impacts of method of payment on M&A performance using data of 2,500 acquisitions in the UK and US over the period 1955 and 1985. The results suggest that acquirers making equity offers create worse post-merger performance than did those using cash. Also Raad & Wu (1995), Hefty (1998) and Travlos (1987) report similar results. However, Heron & Lie (2000) do not find statistically significant difference between deals with different method of payments.

So,

$$x_{i46} = \%cash_of_payment_i$$



Table 3-7 summarises what discussed so far.

		Boosting the revenues	decreasing the costs	Decreasing the risks	Boosting stock market opinion
1	Total asset (bidder/tgt)	+	+	-	
2	total asset growth tgt	+	+	-	
3	Portfolio distance	+	-	-	
4	Same industry? (1=yes, 0=no)	-	+	+	
5	Correlation of the returns bidder/tgt	+		-	
6	Cross border (1=yes;0=no)	+	-	-	
7	Cultural distance	+	-	-	
8	Financial system distance	+	-	-	
9	Economic distance	+	-	-	
10	Political distance	+	-	-	
11	Financial legal system distance	+	-	-	
12	General legal system distance	+	-	-	
13	Fiscal distance	+	-	-	
14	Banking sector assets	+			
15	Gross Dom. Saving Pro cap.	+			
16	Gross Domestic Saving (%GDP)	+			
17	Credit flow	+			
18	Efficiency of the banking system	+			
19	Gross Domestic Saving - Real growth	+		-	
20	Interest rate spread	+		-	
21	GDP Real growth	+		-	
22	GDP (PPP)	+			
23	GDP (PPP) Pro capita	+			
24	Cost/income (tgt/bidder)		+		
25	labour cost ratio		+		
26	Bank regulation		+	-	
27	Regulation quality		+	-	
28	Real corporate taxes		+		
29	Density of population		-		
30	Standard deviation of the returns of the target			-	
31	Correlation of the returns of the target with the market			+	
32	Bribing and corruption			+	
33	Language skills			+	
34	Exchange rate stability			+	
35	Attitude (1=friendly, 0= no friendly)			+	
36	Legal quality			+	
37	Financial institution transparency			+	
38	Central bank transparency			+	
39	transparency of the government			+	
40	Risk of political instability (absence of)			+	
41	ROA tgt			+	
42	ROA growth TGT			?	
43	P/B value TGT (announcement day)				-
44	Relative performance with respect to the market of the target				-
45	Credibility of the manager (BIDDER)				+
46	% of cash				?

Table 3-7 Theoretical impact of each explanatory variable on costs, revenues and risks



The “+” indicates that we predict a positive correlation between that variable and the source of value creation.

3.1.5 The hubris hypothesis

Sometime a merger can be undertaken even if there are no rational reasons for that. At least no reasons why some value could be created. So why don't managers abandon those deals?

Sometimes managers overestimate the gains, however sometimes they *do* know that the merger will not be successful, but they issue the bid anyway. Richard Roll (Roll 1986) advanced the hubris hypothesis to explain that.

The hubris hypothesis is advanced as an explanation of corporate takeovers. Hubris on the part of individual decision makers in bidding firms can explain why bids are made even when a valuation above the current market price represents a positive valuation error. Bidding firms infected by hubris simply pay too much for their targets.

Potential bids are abandoned whenever the acquiring firm's valuation of the target turns up with a figure below the current market price. Bids are rendered when the valuations exceeds the price. If there really are no gains in takeover, hubris is necessary to explain why managers do not abandon these bids also since reflection would suggest that such bids are likely to represent positive errors in valuation.

Hubris predicts that, around a takeover,

- a) the combined value of the target and the bidder should fall slightly
- b) the value of the bidding firm should decrease
- c) the value of the target should increase

Since bidders are usually much larger than targets, the effect of the bid can be buried in the noise of the bidder's return volatility. The hubris hypothesis relies on the fact that managers act, de facto, against shareholders interests by issuing bids founded on mistaken estimates of target firm value and of synergies.



The mechanism by which takeover attempts are initiated and completed suggests that at least part of the large price increases observed in target firm shares might represent a simple transfer from the bidding firm.

The hubris hypothesis ‘depends on the overbearing presumption of bidders that their valuation is correct’. Roll argues that the hubris hypothesis is consistent with strong form market efficiency. He argues that most other explanations of the takeover phenomenon rely on strong form market inefficiency of at least temporary duration.

Therefore, according to the hubris theory, consciously or not, managers may act against their shareholders. The fact that managers do consciously act against their shareholders recall a largely discussed theme, that is the principal agent problem.

This problem arises when the principal, that is the stockholders, and the agent, the manager, do not share the same objectives. As a consequence, the CEO may make decisions which do not maximise the firm’s value, but his own wealth.

Let’s examine the main kinds of investments made for this purpose:

- 1) investments that, by increasing the *dimension* of the firm, boost as well the manager’s power make it easier for him to extract larger fringe benefits
- 2) investments that make very important his competences (*entrenchment*). For example imagine a CEO with a long experience in Japan. During his work as CEO of an American firm, he decides to take over a Japanese company. After that, the probability of being dismissed should decrease.
- 3) Investments in industries which bring *power and famousness*. An example could be the attempt made by some Italian businessmen to acquire Rizzoli Corriere della Sera (RCS) during summer 2005. RCS controls some of the most important Italian communication magazines and newspapers, so the acquisition of that company would bring power and notoriety. Of course power costs, in fact the attempt failed...
- 4) Investments characterised by short term profitability. This is the case especially when the bonus are function of accounting results. As shown when describing the bootstrap phenomenon, we demonstrated that a merger can increase, in the short run, some balance indexes, without enhancing the value of the firm.



Morck, Shleifer and Vishny, 'Do managerial objectives drive bad acquisitions?', *Journal of Finance* 45 (1990) pp 31-48, argue that to the extent that acquisitions serve managers' personal objectives, managers of bidding firms are willing to pay more for targets than they are worth to the bidding firms' shareholders.

They argue that when a firm makes an acquisition or any other investment, its manager considers both his personal benefits from the investment and the consequences for the market value of the firm. Some investments are particularly attractive from the former perspective: they contribute to long term growth of the firm, enable the manager to diversify the risk on his human capital, or improve his job security. When an investment provides a manager with particularly large personal benefits he is willing to sacrifice the market value of the firm to pursue that investment.

Shleifer and Vishny (SV), 'Stock Market Driven Acquisitions', *Journal of Financial Economics* 70(3) (2003) pp295-311 have suggested, in denial of the efficient market hypothesis, a theory which they claim is the opposite of Roll's who argued that financial markets are rational but corporate managers are not. According to SV managers rationally respond to less than rational markets. The theory involves relatively highly valued firms taking over relatively less highly valued firms in the absence of any real synergy. Managers in targets are prepared to sell out because of their short time horizon. Perceived synergy 'is just the lubricant that greases the wheels of the M&A process – it might be invented by investment bankers or academics and have very little to do with the reality of what actually drives acquisitions'.

Jarrell, Brickley and Netter (JBN), 'The market for corporate control: the empirical evidence since 1980' *Journal of Economic Perspectives* (1988) argue that an important factor in determining how these take-over gains are split seems to be how many bidders are trying to acquire the target company. JBN argue that the secular decline in the stock returns to bidders probably reflects the increased competition among bidders and the rise of auction-style contests during the 1980's.

Malmendier and Tate, (MT) 'Who Makes Acquisitions? CEO Overconfidence and the Market Reaction' *unpublished working paper*, 2003, claim to have found evidence in favour of Roll's thesis. MT classify managers as 'overconfident' when, despite their lack of diversification, they hold options on company shares until expiration, presumably because of their confidence in the



company's prospects. MT point out that theory indicates that risk averse managers should exercise share options well before expiration to reduce unsystematic risk in their personal portfolios. MT find that 'overconfident' managers are more acquisitive than average, particularly via diversifying deals. The effects are strongest in cash rich companies and those with untapped debt capacity. Using press coverage where managers are described as 'confident' or 'optimistic' confirms these results. MT also find that the market reacts more negatively to takeover bids by 'overconfident' managers.

We would need then to check the 'overconfidence' of the managers of our companies and their incentive to look for personal benefits.

According to Jensen and Mecking (1976) a good measure of the potential hubris of the management is the degree of separation between control and ownership, that is, a manager who controls the firm by owning a low number of shares would pay a low amount of money of loss given to bad investments, but would get the whole private benefits.

Unfortunately our database does not provide us with data about the degree of separation control-ownership, so we will only use the variable which evaluates the degree of credibility of the managers of the target of the bidder.



3.2 Overview of the previous literature

In paragraph 2.1 we have pointed out the most remarkable values which should explain the creation of value through a merger. Our next step is to study, from a statistical point of view, the impact of each single variable and the whole set of variables, taken together.

This kind of approach is not innovative in literature, indeed we can come up with a high number of papers and researches aimed at illustrating the behaviour of a certain numerical characteristic of the mergers in the financial industry as function of a set of explanatory variables.

What makes each paper different is not only the set of explanatory variables chosen, but, as well, the numerical characteristics to explain, in other words, the dependent variable. Our dependent variable will be the *CAR*, *Cumulative Abnormal Return*, deeply described in the paragraph dedicated to the *Event Study*, other researchers analysed the probability for a bank to become bidder or target, others the efficiency of the banks before and after the merger, others the change in the prices of the services and so on.

Even if all these dependent variables are different, all of them are related to the success of the deal. If two companies are likely to merge, it should mean that the value creation potential is high, moreover the efficiency should be enhanced and the quality of its services, and, as a consequence, its prices, should soar.

We analysed the papers that had already taken into account the explanatory variables chosen before, in order to test which impact they had on the success of the merger, according to their results.

In this paragraph we will yield a brief overview of the content of the papers, by quoting their abstracts, in paragraph 2.3 the impact of each variable, as a result of those studies, will be illustrated.



Akhavein 1997 (*The Effects Of Megamergers On Efficiency And Prices: Evidence From A Bank Profit Function*. Jalal D. Akhavein, Allen N. Berger, David B. Humphrey)

This paper examines the efficiency and price effects of mergers by applying a frontier profit function to data on bank ‘megamergers’. They find that merged banks experience a statistically significant 16 percentage point average increase in profit efficiency rank relative to other large banks. Most of the improvement is from increasing revenues, including a shift in outputs from securities to loans, a higher-valued product. Improvements were greater for the banks with the lowest efficiencies prior to merging, who therefore had the greatest capacity for improvement. By comparison, the effects on profits from merger-related changes in prices were found to be very small.

Beitel 2003(*Explaining the M&A-success in European bank mergers and acquisitions*, Patrick Beitel, Dirk Schiereck, and Mark Wahrenburg).

They study 98 large M&As of European bidding banks from 1985 to 2000 in order to investigate drivers of excess returns to the shareholders of the targets, the bidders, and to the combined entity of the bidder and the target.

Their findings show that many of 13 drivers identified mostly from prior, US-focused research have significant explanatory power, indicating that the stock market reaction to M&A-announcements of European bidding banks can be at least partly forecasted.

Their results are largely consistent with the US-experience and confirm the preference of stock markets for focused transactions and against diversification. Moreover, they find that less active bidders create more value than more active/experienced bidders. This stands in contrast to some US research and may indicate that managers of frequent European bidding banks may be motivated by other objectives than creating shareholder value.



Cornett 2000 (*The impact of the manager–shareholder conflict on acquiring bank returns*, Cornett, M.M., Hovakimian, G., Palia, D., et al.)

This paper examines whether shareholder value-maximizing corporate governance mechanisms assist in reducing the managerial incentive to enter value-destroying bank acquisitions.

They find that diversifying bank acquisitions earn significantly negative announcement period abnormal returns (AR) for bidder banks whereas focusing acquisitions earn zero AR. They then find that corporate governance variables (such as CEO share and option ownership and a smaller board size) in the bidding bank are less effective in diversifying acquisitions than in focusing acquisitions. These results are robust to the inclusion of the usual control variables.

Cybo 1999 (*Mergers and shareholders wealth in European Banking*, Alberto Cybo-Ottone and Maurizio Murgia)

They study 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 their 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.



DeLong 2001 (*Stockholder gains from focusing versus diversifying bank mergers*, Gayle L. DeLong)

This paper shows bank mergers that enhance value upon announcement can be distinguished from those that do not create value. She classifies mergers of banking firms according to activity and geographic similarity (focus) or dissimilarity (diversification), and examines the abnormal returns to each group as a result of the merger announcement.

Mergers that focus both activity and geography enhance stockholder value by 3.0% while the other types do not create value. Analysis reveals that abnormal returns upon merger announcement increase in relative size of target to bidder, but decrease in the pre-merger performance of targets.

DeLong 2001 bis (*Cross-Border Bank Mergers: What Lures the Rare Animal*, Gayle L. DeLong, Claudia M. Buch)

Although domestic mergers and acquisitions (M&As) in the financial services industry have increased steadily over the past two decades, international M&As were relatively rare until recently.

This paper uses a novel dataset of over 2,300 mergers that took place between 1978 and 2001 to analyse the determinants of international bank mergers. They test the extent to which information costs and regulations hold back merger activity.

Their results suggest that banks operating in more regulated environments are less likely to be the targets of international bank mergers. Hence, the lifting of regulations can spur growth in cross-border bank mergers. Also, mergers tend to be less frequent if information costs are high.

European Commission 2005 (*Cross-border consolidation in the EU financial sector*)

In September 2004, the Council of Economic and Financial Affairs, meeting informally in Scheveningen, discussed the issue of lagging cross-border consolidation in the banking area.



The discussion was fuelled by a paper presented by the Presidency indicating low level of cross-border consolidation in this area and presentations by CEOs of leading European banks explaining the reasons behind this phenomenon.

Whereas the discussion focused primarily on the banking industry, it is well known that this low level of cross-border consolidation is not only confined to this market segment. It is largely relevant for the whole financial sector, with some nuances.

As a follow-up to their discussion, Finance Ministers invited the Commission to examine further possible explanations for the low level of pan-European restructuring specific to the financial sector.

To this effect, the Ministers mandated the Commission to review the obstacles to cross-border mergers and acquisitions (M&As), in order to identify possible internal market failures, gaps or shortcomings. Finance Ministers also took note of the Commission's intention to review how the supervisory approval process could be improved.

The primary role of the Commission is to ensure that existing EU law is enforced properly.

The Commission does not favour specific business models or shape of markets, as long as they are in conformity with the European law. On that basis, it is the role of the Commission to analyse the functioning of the market, in order to detect any unjustified obstacles that would hamper companies in making their own decisions regarding the organisation of their business in the Internal Market. In addition, the Commission has also the task of proposing growth supportive actions within the context of the overall EU competitiveness policy.

In the banking sector, the misuse of supervisory powers to block cross-border mergers has been identified by Ministers of Finance as a possible obstacle to cross-border mergers and acquisitions.

The Commission has already taken the initial steps to propose legislative changes, aimed at improving and clarifying the current provisions in the relevant directive, to avoid such situations. In order to ensure cross-sectorial consistency, similar provisions in the insurance sector are also examined, in the ongoing preparatory work for the Solvency II



project.

At the same time, there may be other factors explaining the lack of cross-border mergers in the financial services sector. This paper aims to provide a thorough analysis of these issues, in order to foster the political debate and provide evidence-based guidance to possible future policy actions:

- Firstly, the cross-border consolidation process of the EU financial sector since 1999 is described in detail, to paint the background picture and provide an objective view of what is happening on the ground;
- Then the views of market participants (gathered through an open survey conducted in Spring 2005) are presented, as they are the best placed to explain what are the main drivers and the main obstacles behind companies' decisions to engage or not in cross-border activities;
- Finally, the issues raised by the economic analysis and the market participants' views are examined, in order to prepare the political debate.

Hawawini 1990 (*Mergers and acquisitions in the US-banking industry: Evidence from capital markets*. Hawawini, G.A. and Swary, I.)

The purpose of the study is to examine the merger phenomenon in the banking industry by answering the following questions:- What are the incentives for banks to merge? - Has the prohibition of interstate banking prevented banks from diversifying and has it increased the rate of bank failures by restricting (geographical) diversification opportunities? - Are bank mergers wealth-creating activities and how are the gains/losses from a merger distributed between the acquiring and acquired bank shareholders? - How can the changes in shareholder wealth resulting from bank mergers be explained and are there differences between interstate and intrastate mergers? - What are the implications of the study's findings for regulatory policy?



Houston 1994 (*The overall gains from large bank mergers*. Houston, J.F. and Ryngaert, M.D.)

They demonstrate that the overall gains (the weighted average of gains to the bidder and target firms) from a recent sample of bank mergers are slightly positive, but statistically indistinguishable from zero.

This lends support to recent studies which fail to find any significant cost savings resulting from bank mergers. They also demonstrate the characteristics of mergers that the market perceives as most valuable.

These attributes include high prior levels of profitability for the bidder, considerable operations overlap between the target and the bidder, and a method of financing that reveals positive information about the bidder or the synergies likely to be created by the merger.

Houston 1997 (*Equity Issuance and Adverse Selection: A Direct Test Using Conditional Stock Offers*, Houston, J.F. and Ryngaert, M.)

The authors conduct a unique test of adverse selection in the equity issuance process. While common stock is the dominant means of payment in bank mergers, stock acquisition agreements provide target shareholders with varying degrees of protection against adverse price movements in the bidder's stock between the time of the merger agreement and the time of merger completion.

The authors show that it is the degree of protection against adverse price changes and not the percent of stock offered in a bank merger that explains bidder merger announcement abnormal returns. This result is difficult to explain outside of an adverse selection framework.

Jandik 2005 (*Legal Systems, Information Asymmetry, and Firm Boundaries: Cross Border Choices to Diversify Through Mergers, Joint Ventures, or Strategic Alliances*, Tomas Jandik and Raja Kali)

They examine how the organizational structure for diversification decisions involving firms from different countries is affected by the institutional context of the target country.



Their theoretical analysis suggests that as legal systems improve and information asymmetry is reduced, a transition from relational, “firm-like” arrangements to arms length, “market-like” arrangements takes place.

If institutions continue to improve, eventually a threshold is crossed after which arms-length deals edge out internal firm contracting.

They provide an empirical test of the model using the sample of international strategic alliances, joint ventures and cross-border mergers involving US firms. Their empirical findings support the predictions of the theory. In addition, they document that US companies entering organizational structures predicted by their model are associated with greater abnormal returns around deal announcements.

Meon 2005 (*Can mergers in Europe help banks hedge against macroeconomic risk?* Pierre-Guillaume Méon, Laurent Weill)

This paper investigates the motive of geographic risk diversification in the lending activity for bank mergers in the EU on a sample of large banking groups. Geographic diversification should allow banks to reduce their risk.

They observe that the loan portfolios of European banks are home-biased. They apply the portfolio approach to explore the risk-return efficiency of the locations of banks’ activities.

They also study mergers between pairs of banks. They provide evidence of the sub-optimality of the loan portfolios of European banks in terms of geographic risk diversification, and of the existence of potential gains from inter-country pair mergers.

Myers and Majluf (*Corporate Financing and investment decisions when firms have information that investors do not have*, Myers, Stewart and Nicholal S. Majluf)

This paper considers a firm that must issue common stock to raise cash to undertake a valuable investment opportunity. Management is assumed to know more about the firm’s



value than potential investors. Investors interpret the firm's actions rationally. An equilibrium model of the issue-invest decision is developed under these assumptions.

The model shows that firms may refuse to issue stock, and therefore may pass up valuable investment opportunities. The model suggests explanations for several aspects of corporate financing behaviour, including the tendency to rely on internal sources of funds, and to prefer debt to equity if internal financing is required. Extensions and applications of the model are discussed.

Pilloff 1996 (*Performance Changes and Shareholder Wealth Creation Associated with Mergers of Publicly Traded Banking Institutions*, Pilloff, S.J. (1996))

This paper examines the mean and cross-sectional behaviour of performance changes and consolidated abnormal returns among a sample of forty-eight mergers occurring from 1982 to 1991 involving publicly traded banking institutions.

Although both merger-related performance changes and consolidated abnormal returns are small or nonexistent, these measures show a great deal of cross-sectional variation.

However, the dispersion in performance changes and abnormal returns is related to different factors suggesting that expectations and outcomes are influenced by different variables. Further strengthening this notion that expectations and outcomes are unrelated are insignificant correlations of abnormal returns and performance changes.

Pilloff 1998 (*The value effects of bank mergers and acquisitions. Mergers of Financial Institutions*, Pilloff, S.J. and Santomero, A.M.)

The banking industry has experienced an unprecedented level of consolidation on a belief that gains can accrue through expense reduction, increased market power, reduced earnings volatility, and scale and scope economies. A review of the literature suggests that the value gains that are alleged have not been verified. The paper then seeks to address alternative explanations and reconcile the data with continued merger activity.



Resti 2004 (*Competitività e M&A: le aggregazioni bancarie creano valore? Il punto di vista del mercato.* Andrea Resti, Lucia Galbiati)

The objective of paper is to examine the market reaction to the announcement of a merger between two financial institutions.

They found that target firms experience high stock returns, while bidder slightly destroy value for their shareholders. The analysis of various temporal windows shows that the market seems to be less sceptical as new information about possible synergies is spread.

The target returns are higher when the target is relatively small and the deal is cross border and announced after March 2000. The combined returns are not significantly different from zero.

Salleo 1999 (*Why do banks merge?* Dario Focarelli, Fabio Panetta, Carmelo Salleo)

The banking industry is consolidating at an accelerating pace, yet no conclusive results have emerged on the benefits of mergers and acquisitions. They analyze the Italian market, which is similar to other main European countries.

By considering both acquisitions (i.e. the purchase of the majority of voting shares) and mergers they evidence the motives and results of each type of deal. Mergers are more likely between a more and a less services-oriented bank; they seek to improve income from services, but the resulting increase is offset by higher staff costs; return on equity improves because of changes in the capital structure.

Acquisitions are more targeted towards banks with a poor credit management record; they aim to restructure the loan portfolio of the acquired bank; improved lending policies result in higher profits.



Travlos 1987 (*Corporate takeover bids, methods of payment and bidding firm's stock returns*, Travlos, N.G.)

This study explores the role of the method of payment in explaining common stock returns of bidding firms at the announcement of takeover bids. The results reveal significant differences in the abnormal returns between common stock exchanges and cash offers.

The results are independent of the type of takeover, merger or tender offer, and of bid outcomes. These findings supported by analysis of nonconvertible bonds, are attributed mainly to signalling effects and imply that the inconclusive evidence of earlier studies on takeovers may be due to their failure to control for the method of payment

Wall 1989 (*Motivations for Bank Mergers and Acquisitions: Enhancing the Deposit Insurance Put Option versus Increasing Operating Net Cash Flow*, William C. Hunter, Larry D. Wall and George J. Benston)

This paper examines the prices bid for target banks in the early to mid-1980's. Two hypotheses are examined: the operating-net-cash-flow hypothesis, which holds that banks should bid more for merger partners that offered risk-reduction opportunities, and, the deposit insurance put-option hypothesis, which holds that acquirers would bid more for targets that offered opportunities to increase risk and/or become "too big to fail." An empirical analysis of a sample 302 mergers produces results that are consistent with the operating-net-cash-flow hypothesis and inconsistent with the deposit insurance put-option hypothesis.

Zollo 2000 (*Can firms learn to acquire? Do markets notice?* Zollo, M. and Leshchinskii, D.)

Using financial, accounting and questionnaire response data they investigate the post-acquisition performance of 47 US bank holding companies that executed 579 mergers and acquisitions in the 1964-1996 period and compare it with their competitors' performance.

The objectives of the study are to identify the factors that explain the variance in the distribution of post-acquisition performance, and to test whether the financial markets efficiently predict performance outcomes by incorporating public information about the acquiring firm into the stock price following the acquisition announcement.



The tested model includes measures of post-acquisition decisions, such as the degree of integration of the target within the acquirer's structure and the replacement of the top management team, as well as approximations of the acquirer's capability to implement the integration process.

They find that prior acquisition experience does not improve post-acquisition performance, but the degree to which acquirers articulate and codify their experience in ad-hoc tools does. Furthermore, a high level of integration of the target within the acquirer's organization improves long-term performance, whereas the replacement of top management worsens it.

Financial markets do not seem to be sensitive to any of these predictors of performance in their short-term reactions, but long-term adjustments are significantly impacted by acquirers' integration strategies and codified implementation knowledge, in line with the variations of accounting returns.



3.3 Testing our explanatory variables upon previous literature

In this paragraph we bunch our 46 explanatory variables in groups made up of 4 levels. For each variable we screen out the papers illustrated in the previous paragraph to check the results achieve. This will be very useful when checking the consistency of our results.

Not for every variable we found previous results, some others were similar conceptually with ours, but different in the way it was calculated. We take them into account anyway. (Table 3-8).

EXPLANATORY VARIABLE			ID	REFERENCE	RESULT
COUNTRY SPECIFIC VARIABLES	Legal framework	<i>Financial legal system</i>	Bank regulation	26	DeLong 2001 (bis) The lifting of regulations can spur growth in cross-border bank mergers.
			Financial institution transparency	37	Commission 2005 The financial sectors include institutions with complex legal setup resulting in opaque decision making processes, which may constitute a significant failure risk
		<i>General legal system</i>	Legal quality	36	Commission 2005 Some legal structures may prevent, de iure or de facto, some institutions to be taken over or merge or even there may exist impediments to effective control. This can add additional risk and costs to the transaction
			Regulation quality	27	Jandik 2005 As legal systems improve and information asymmetry is reduced, a transition from relational, "firm-like" arrangements to arms length, "market-like" arrangements takes place.
	Political framework		Central bank transparency	38	Commission 2005 The misuse of supervisory powers and the complexity of numerous supervisory approval processes may increase the level of uncertainty and risk of the transaction
			Risk of political instability	40	Commission 2005 The political interference may block, obstruct or speed up a merger, regardless it is compatible or not with the existing rules
			Transparency of the government	39	
Macro economical framework	<i>Financial system</i>	Banking sector assets	14		
		Credit flow	17		
		Efficiency of the banking system	18		
		Gross Dom. Saving Pro cap.	15		



EXPLANATORY VARIABLE			ID	REFERENCE	RESULT
General economics		Gross Domestic Saving (%GDP)	16	DeLong (2001) bis	Insignificant
		Gross Domestic Saving - Real growth	19		
		Interest rate spread	20	DeLong (2001) bis	Insignificant
		Exchange rate stability	34		
		GDP (PPP)	22	DeLong (2001) bis	Large, relatively poor nations tend to be the targets.
		GDP (PPP) Pro capita	23		
		GDP Real growth	21		
		Bribing and corruption	32		
Cultural framework		Credibility of the manager (BIDDER)	45	See the paragraph The hubris hypothesis"	
		Language skills	33	DeLong (2001) bis	Cross-border bank merger partners tend to speak the same language and to be close in terms of distance
		Density of population	29	DeLong (2001) bis	Cross border mergers are vehicles for acquirers to overcome the problem of reaching a population that is widely spread.
GEO		Real corporate taxes	28	Commission 2005	The regime of taxation on dividends, on financial products and services, on VAT and in general the uncertainty on tax arrangements can bring about different pros and cons in arranging a transaction in each country
Fiscal		Cultural distance	7	Commission 2005	Some differences in product mix are explained by different habits, preferences and history. This is particularly true for common products, such as payment instruments, therefore the potential for product rationalization may be more limited.
Distances		Financial system distance	8	Commission 2005	The fragmentation of equity or credit markets in the world may impose additional cost on a cross border merger. Moreover differences in the preferences of the customers in the financial industry may result both in an opportunity of diversification and in a blind jump on a unknown market
		Economic distance	9	Commission 2005	Differences in economic cycles may have a role in the value creation process as well as a strong effect on profitability
		Political distance	10	Commission 2005	No cross border merger can be achieved if there is a strong political opposition



EXPLANATORY VARIABLE			ID	REFERENCE	RESULT	
			Financial legal system distance	11	Divergences in supervisory practices or lack of transparency in term of requirements can impose a significant and costly administrative burden	
			General legal distance	12	Difference of approaches in private law may impose a country-by-country approach for some products, which would cause additional risks and costs	
				DeLong (2001) bis	The presence of a common legal system has a positive impact on cross-border M&As. However, precisely the fact that the target bank has experience in dealing with a different legal environment could make it an attractive partner. In this case, the effect of a common legal system might be negative.	
			Fiscal distance	13	The presence of exit taxes on capital gains, the presence of a discriminatory tax treatments for foreign products or services or the lack of a homogeneous system of loss compensation at a group level can impact dramatically on the success of a cross border merger	
BANK SPECIFIC VARIABLES	% Cash		% of cash	46	Target returns are higher when cash ratio is high, bidder returns are slightly higher in transactions in stocks	
				Travlos(1987)	He shows that tee target shareholders prefer cash payment	
				Myers and Majluf (1984)	Bidders prefer cash payments if they believe that their stock are undervalued and vice versa	
	Risks	Attitude	Attitude (1=friendly, 0= no friendly)	35		
		Dimension	Total asset (bidder/tgt)	1	The acquisition of small targets creates higher excess returns for the target. Not significant nor for bidders or for combined CAR.	
					Hawawini 1990	
					Zollo 2000	
					Seidel 1995	



EXPLANATORY VARIABLE			ID	REFERENCE	RESULT
Diversification VS focalization	<i>Market</i>			Resti 2004	The transactions involving smaller targets are successful for both
		Standard deviation of the returns of the target	30	DeLong (2001) bis	Insignificant
		Correlation of the returns of the target with the market	31		
	<i>Product</i>	Same industry? (1=yes, 0=no)	4	Beitel 2003	They estimate the product focus as the ratio of the net interest income of the target to total operating income of the target. They found out that bidders are more successful in focused transactions, while it occurs the opposite for the target. The impact on the combined CAR is unclear.
		Portfolio distance	3	DeLong 2001	Increased product focus has a positive effect on M&A success
				Cornett 2000	Increased product focus has a positive effect on M&A success for the bidders
				Cybo 1999	Bidding banks show a negative market reaction in case of M&A between banks, while reach a positive CARs when announced a diversification merger.
	<i>Geographical</i>	Cross border (1=yes;0=no)	6	Beitel 2003	Bidders create value in geographical focused transactions, whereas targets in cross border transactions.
				Houston 1997	Geographic focus has a positive impact on M&A success
				Resti 2004	In cross border transactions targets benefit from higher value creation. It is not relevant to bidders.
				Cybo 1999	Only the combined value of domestic deals create shareholder value, whilst cross-border deals did not capture positive expectations from the market.
				Meon 2005	He shows some evidence about the existence of potential gains in risk diversification through cross border deals
	<i>Market</i>	Correlation of the returns bidder/tgt	5	Beitel 2003	A high diversification potential (low correlations) negatively impacts on the value creation in particular for the bidder.
				Resti 2004	A high diversification potential (low correlations) negatively impacts on the value creation in particular for the bidder.



EXPLANATORY VARIABLE			ID	REFERENCE	RESULT
Target profitability	Balance	ROA tgt	41	Hawawini 1990	The transactions involving highly correlated companies create more value for the bidding bank
				Beitel 2003	They are unable to find significant impact on excess returns
				Pilloff 1998	Transactions are more successful if bidders are more profitable than the target
				Houston 1994	Transactions are more successful if bidders are more profitable than the target
				Resti 2004	The higher the ROA of the target, the more value it creates
	Market	Relative performance with respect to the market of the target	44	Salleo 1999	Profitability (ROA) negatively affects the probability of being acquired.
				Beitel 2003	Both bidders and targets benefit from bidders taking over targets with low market performances
				DeLong 2001	Transactions are more successful if targets show a poor stock performance compared to their peer group before the transaction
				Hawawini 1990	They consider the stock performance as a good proxy for the management quality of the target. Therefore the acquisition of a bad managed target can create a higher improvement potential and create more value
				P/B value TGT (announcement day)	Bidding banks are more successful in transactions where they bid for targets with better P/B ratio.
Relative efficiency	Costs	Cost/income (tgt/bidder)	24	Beitel 2003	They check two very correlated variables; cost-to-asset ratio and cost-to-income and discover that the take over of less cost efficient targets is significantly more value creating for both
				Akhavein 1997	Merged banks experience a statistically significant 16 percentage point average increase in profit efficiency
				Pilloff 1996	The improvement of the cost efficiency after the transaction is positively correlated to the value creation. Improvements are greatest for the banks with the lowest efficiencies prior to merging, who therefore had the greatest capacity for improvement.
	Salaries	Labour cost ratio (bidder/target)	25	Salleo 1999	Bidders are more likely to have better labour cost ratios
Target growth	Profitability	ROA growth TGT	42		



EXPLANATORY VARIABLE			ID	REFERENCE	RESULT
	<i>Dimensions</i>	Total asset growth TGT	2	Beitel 2003	Not relevant for the target, whereas bidders and combined entity get better returns when acquiring fast growing targets.
				DeLong 2001	She considers transactions that are both geographic and product diversifying as being purely growth oriented. She found that these transactions significantly create value
				Cornett 2000	Growth oriented transactions destroy value for the bidder.
				Wall 1989	This variable is not relevant to the value creation
				Cybo 1999	The stock market's expectations for future performance are more positive for small deals than for large deals.
				Salleo 1999	The active banks are more likely to be larger

Table 3-8 Impact on the success of the deal of the explanatory variables in previous literature



4 Econometric tools

In this chapter we will briefly describe the main statistic techniques we have utilized in our work to test the impact of the variables described in the previous chapter on the value creation. In particular we have structured the chapter in four main sections. In the first one we will describe the event study methodology; in the second one the regression technique is shown; in the following section we'll explain the principal characteristics of the univariate analysis; to conclude in the last section we will talk about the discriminate technique



4.1 The Event study methodology

The econometric tool we adopt to study the impact of the announcement of the merger on the value of the companies involved in the merger is the *event study*.

In the first paragraph we provide a brief explanation of the main features of the event study, in the second a logical flow of the technique is given, accompanied by an example; in the third we point out the main assumptions under which the methodology is reasonable.

4.1.1 What is an event study?

Economists are frequently asked to measure the effects of an economic event on the value of firms. On the surface this seems like a difficult task, but a measure can be constructed easily using an event study.

Using financial market data, an event study measures the impact of a specific event on the value of a firm.

The usefulness of such a study comes from the fact that, given rationality in the marketplace, the effects of an event will be reflected immediately in security prices. Thus a measure of the event's economic impact can be constructed using security prices observed over a relatively short time period. In contrast, direct productivity related measures may require many months or even years of observation.

The event study has many applications. In accounting and finance research, event studies have been applied to a variety of firm specific and economy wide events. Some examples include mergers and acquisitions, earnings announcements, issues of new debt or equity, and announcements of macroeconomic variables such as the trade deficit. However, applications in other fields are also abundant. For example, event studies are used in the field of law and economics to measure the impact on the value of a firm of a change in the regulatory environment (see G. William Schwert 1981) and in legal liability cases event studies are used to assess damages (see Mark Mitchell and Jeffry Netter 1994).



In the majority of applications, the focus is the effect of an event on the price of a particular class of securities of the firm, most often common equity. In this thesis the methodology is discussed in terms of applications that use common equity. However, event studies can be applied using debt securities with little modification. Event studies have a long history. Perhaps the first published study is James Dolley (1933).

4.1.2 The main steps

Let's suppose we want to calculate the value added through the merger between the Italian Unicredito Italiano SpA and the German Bayerische Hypo- und Vereins (HVB), announced on May, 30th 2005.

The steps we have to face to solve our queries are:

- 1) Identifying the event of interest and defining an event window
- 2) Predicting a "normal" outcome during the event window in the absence of the event (we will utilise the CAPM model)
- 3) Estimating the Cumulative Abnormal Return (CAR) within the event window
- 4) Testing whether the cumulative abnormal return is statistically different from zero

Let's go into details, trying not to dig into deep statistical features.

4.1.2.1 Identifying the event of interest and defining an event window

The event of interest, in our study, is quite clear: the merger between two companies. As the object of our work is the reaction of the market, it is evident that the date of the event coincides with the date in which the market is officially informed about the event, that is the official announcement day.

As we said above, the event study requires the identification of a period, the *event window*, during which we need to compare the real stock returns with the normal one; therefore in that window we suppose that the market reacts to the event, resulting in an abnormal change in the stock price. So, the arising questions are: when does this window have to start, or, from another point of view, when does the market start to react to the event? Secondly, how long this reaction lasts? These are very core queries, whose answer may alter the results a great deal.



We will follow the approach adopted by Andrea Resti (Resti 2004), which considered that:

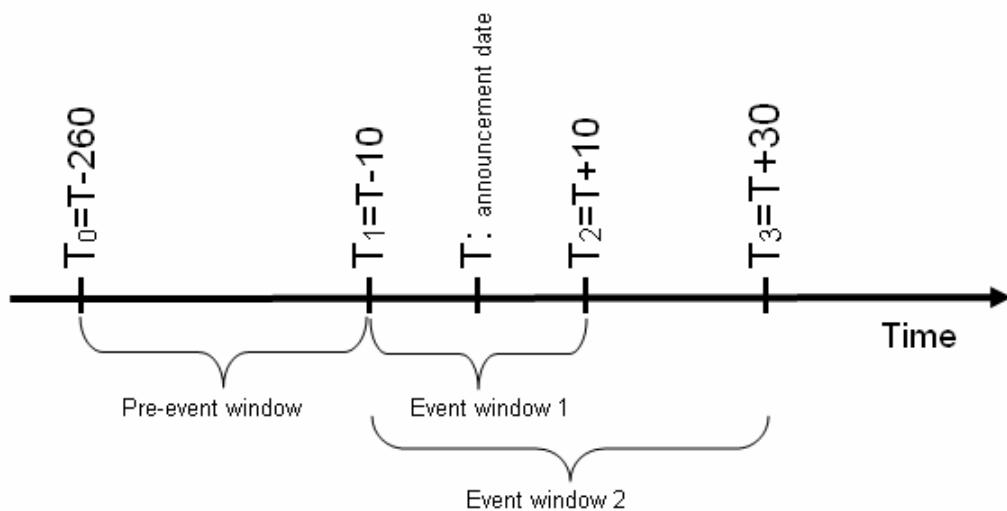
1. A large window may provide unreadable results, as during that window many other events may occur and impact on the value;
2. A too short window may not include the whole reaction of the market, which, differently from what the efficiency hypothesis implies, does not react instantaneously, but gradually as more information is provided;
3. Very often, especially in less efficient stock markets, some information reaches the market before the official announcement;

As result of those considerations, we will take into account two event windows and one pre event window, which, as we will show later, is used to estimate the normal pattern of the stock.

We call T the day in which the merger is officially announced. We define three periods, which only consider the days in which the stock exchange is opened:

- *Pre event window*: which starts 260 days before the announcement and ends 10 days before, therefore it lasts 250 days, that is, more or less, a fiscal year. It is used to estimate several parameters which give information about the *normal* performance of the company.
- *Event window 1*: which lasts 20 days and is used to estimate the reaction of the parameters of the company to the announcement. It starts 10 days before the official announcement because the market, especially if little efficient, may be aware of some news before the official announcement.
- *Event window 2*: it is an extension of the event window 2 and includes 20 days more. It is used to estimate the reaction of the market in a longer run.





graph 4-1The pre-event and event windows

In our example the Pre-event starts on May, 31st 2004 and ends on May, 13th 2005. The Event window one starts on May, 16th 2005 (the 14th and 15th were weekend days) and ends on June,10th 2005; the Event windows 2 ends on July, 11th 2005.

4.1.2.2 Predicting a "normal" outcome: the CAPM

How should the outcome of the stock have been in absence of the event or under the hypothesis the event is not relevant? If the event does not occur or it is not relevant, we say that the stock behaves *normally*, but what does normal mean? In our work we assume that the normal outcome of a stock is explained by the *Capital Asset Pricing Model (CAPM)*, introduced by the Nobel Prize W. F. Sharpe in 1964 (Sharpe 1964).

Capital Asset Pricing Model (CAPM) is a financial model. It explains the variation in the rate of return on an asset (stock of a company) as a function of the rate of return on a market portfolio which consists of all publicly traded stocks. The rate of return is measured relative to the return on a risk-free asset, r_f . The difference is the risk premium that can be either positive or negative depending whether there is a punishment or a reward for the risky investment.



The CAPM model postulates that the risk premium on stock j ($r_j - r_f$) is **proportional** to the risk premium on the market portfolio ($r_m - r_f$). The econometric model can be stated as:

$$(r_j - r_f) = \alpha + \beta(r_m - r_f) + \varepsilon_j$$

The value of beta is important in the decision of the investor.

- If Beta is >1 , it shows that the stock returns are more volatile than the market and it is receiving a greater return for the risk.
- If Beta is <1 , it shows that the stock returns are less volatile than the market and it is receiving a smaller return for the less risk.
- It is expected that α is equal to 0, which gives a proportional relationship between $(r_j - r_f)$ and $(r_m - r_f)$.

CAPM is based on the idea that investors demand additional expected return (called the risk premium) if they are asked to accept additional risk.

A consequence of CAPM-thinking is that it implies that investing in individual stocks is pointless, because one can duplicate the reward and risk characteristics of any security just by using the right mix of cash with the appropriate asset class. This is why die-hard followers of CAPM avoid stocks, and instead build portfolios merely out of low-cost index funds.

If we let $\hat{\alpha} = \alpha + r_f - \beta r_f$ and $\hat{\beta} = \beta$ and adding the time index t , we get

$$r_{jt} = \hat{\alpha} + \hat{\beta} r_{Mt} + \varepsilon_{jt} = n_{jt} + \varepsilon_{jt}$$

We define n_{jt} as the normal return of the stock j at time t .

By running a linear regression during the Pre-event period we get the two parameters needed. We use as returns of the market the percentage change in the value of the financial index of the market as provided by *Dow Jones Indexes*.

Attachment A shows the results for our example.



4.1.2.3 Estimating the Cumulative Abnormal Return (CAR) within the event window

We defined the abnormal return ε_{jt} as the difference between the normal return and the observed return. We define now the Cumulative Abnormal Return as the sum of the abnormal return throughout the event window, EW.

$$CAR_j = \sum_{t \in EW} \varepsilon_{jt}$$

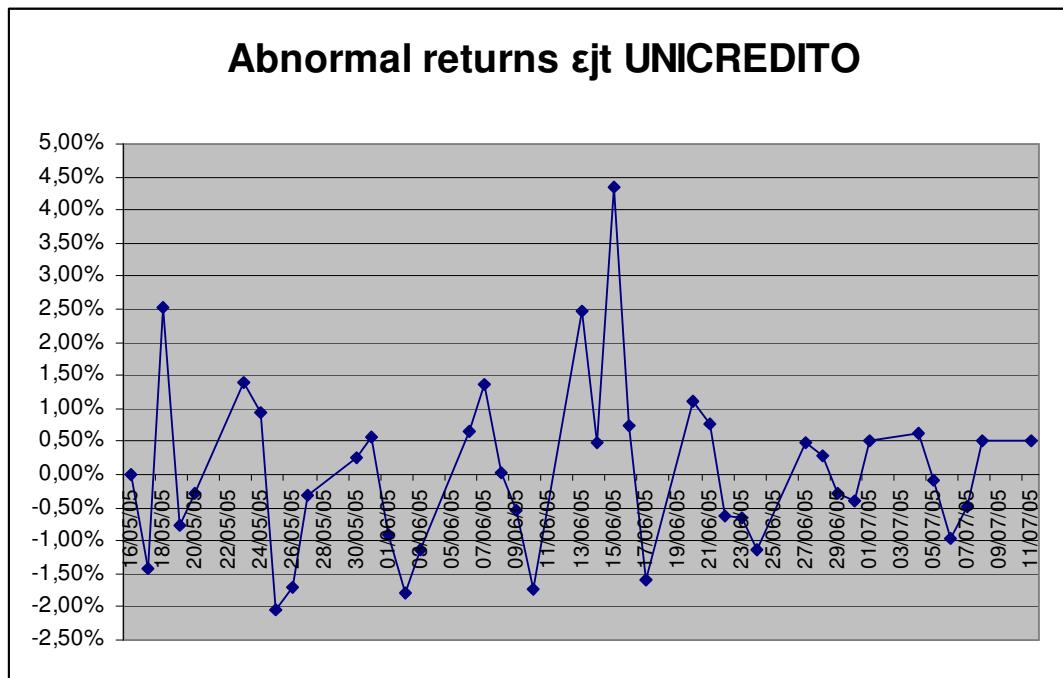
The CAR is a proxy of the value created, or destroyed, by the event as percentage of the market value.

Table 4-1, Table 4-2, Table 4-3, Table 4-4, and Table 4-5 illustrate the results for our example.

Date t	Stock returns r_{jt}	Normal returns η_{jt}	Abnormal returns ε_{jt}
16/05/2005	0,00%	-0,01%	0,01%
17/05/2005	-2,35%	-0,92%	-1,43%
18/05/2005	3,73%	1,19%	2,54%
19/05/2005	-0,72%	0,04%	-0,76%
20/05/2005	-0,45%	-0,17%	-0,28%
23/05/2005	0,84%	-0,57%	1,41%
24/05/2005	0,64%	-0,29%	0,93%
25/05/2005	-2,02%	0,02%	-2,05%
26/05/2005	-1,59%	0,10%	-1,70%
27/05/2005	-0,48%	-0,18%	-0,30%
30/05/2005	0,90%	0,64%	0,27%
31/05/2005	0,42%	-0,16%	0,57%
01/06/2005	-0,30%	0,60%	-0,90%
02/06/2005	-1,73%	0,06%	-1,79%
03/06/2005	-1,70%	-0,57%	-1,13%
06/06/2005	0,49%	-0,16%	0,66%
07/06/2005	1,97%	0,60%	1,37%
08/06/2005	0,12%	0,10%	0,02%
09/06/2005	0,18%	0,73%	-0,55%
10/06/2005	-1,62%	0,10%	-1,72%
13/06/2005	2,99%	0,52%	2,47%
14/06/2005	0,30%	-0,18%	0,47%
15/06/2005	4,79%	0,43%	4,36%
16/06/2005	1,07%	0,32%	0,75%
17/06/2005	-1,45%	0,15%	-1,60%

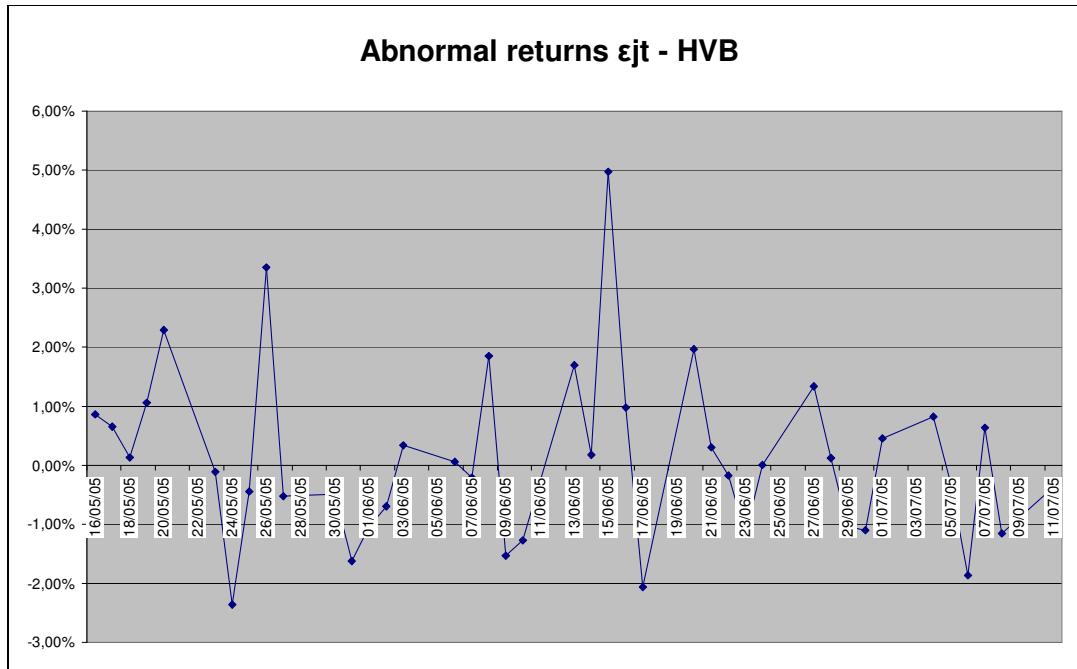


20/06/2005	0,91%	-0,19%	1,10%
21/06/2005	1,12%	0,35%	0,78%
22/06/2005	-0,61%	0,03%	-0,64%
23/06/2005	-0,95%	-0,29%	-0,66%
24/06/2005	-2,14%	-1,01%	-1,13%
27/06/2005	-0,06%	-0,53%	0,47%
28/06/2005	0,81%	0,51%	0,30%
29/06/2005	0,00%	0,29%	-0,29%
30/06/2005	-0,11%	0,29%	-0,40%
01/07/2005	0,97%	0,45%	0,52%
04/07/2005	0,51%	-0,11%	0,62%
05/07/2005	-0,06%	0,03%	-0,08%
06/07/2005	-0,73%	0,22%	-0,96%
07/07/2005	-2,16%	-1,68%	-0,48%
08/07/2005	1,51%	1,01%	0,50%
11/07/2005	1,09%	0,58%	0,51%

Table 4-1 Unicredito during the Event Window**Table 4-2 Abnormal returns graph – UNICREDITO**

Date t	Stock returns r_t	Normal returns η_t	Abnormal returns ε_t
16/05/05	0,33%	0,28%	0,86%
17/05/05	1,88%	-0,32%	0,65%
18/05/05	1,42%	1,74%	0,14%
19/05/05	2,32%	0,36%	1,06%
20/05/05	0,37%	0,03%	2,29%
23/05/05	-2,73%	0,48%	-0,11%
24/05/05	-0,42%	-0,37%	-2,36%
25/05/05	5,05%	0,02%	-0,44%
26/05/05	-0,24%	1,69%	3,36%
27/05/05	1,38%	0,28%	-0,52%
30/05/05	-1,96%	1,88%	-0,49%
31/05/05	0,20%	-0,34%	-1,62%
01/06/05	-0,79%	1,25%	-1,04%
02/06/05	-0,41%	-0,09%	-0,70%
03/06/05	-0,51%	-0,75%	0,34%
06/06/05	1,41%	-0,57%	0,06%
07/06/05	2,06%	1,63%	-0,21%
08/06/05	-0,89%	0,21%	1,85%
09/06/05	-0,68%	0,64%	-1,53%
10/06/05	2,13%	0,60%	-1,27%
13/06/05	0,35%	0,44%	1,70%
14/06/05	4,95%	0,17%	0,18%
15/06/05	1,81%	-0,03%	4,98%
16/06/05	-1,51%	0,84%	0,98%
17/06/05	1,44%	0,56%	-2,07%
20/06/05	0,90%	-0,53%	1,96%
21/06/05	0,00%	0,59%	0,31%
22/06/05	-1,26%	0,17%	-0,17%
23/06/05	-1,51%	-0,09%	-1,17%
24/06/05	0,24%	-1,51%	0,00%
27/06/05	0,88%	-1,09%	1,34%
28/06/05	-0,15%	0,76%	0,12%
29/06/05	-1,19%	0,89%	-1,03%
30/06/05	1,39%	-0,09%	-1,10%
01/07/05	1,02%	0,93%	0,46%
04/07/05	-0,46%	0,20%	0,82%
05/07/05	-0,50%	-0,14%	-0,31%
06/07/05	-1,43%	1,37%	-1,86%
07/07/05	0,83%	-2,06%	0,64%
08/07/05	1,12%	1,98%	-1,15%
11/07/05	-0,50%	1,49%	-0,37%

Table 4-3 HVB during the Event Window

**Table 4-4 Abnormal returns during the Event Window – HVB**

CAR 10 DAYS target	CAR 30 DAYS target	CAR 10 DAYS bidder	CAR 30 DAYS bidder
3,02%	9,16%	-4,23%	2,00%

Table 4-5 Results

In this example the target shows a statistic relevant positive CAR in the short and middle term, while the bidder shows a value creation only in the middle term (30 days).

Together with the CAR of the two companies, it is very interesting to calculate the CAR of the combined entity, that is the abnormal change in the sum of the market values of the two companies before and after the announcement. To estimate it, we follow Resti (Resti 2003):



$$CAR_{combined} = \frac{CAR_{bidder}MV_{bidder} + CAR_{target}MV_{target}}{MV_{bidder} + MV_{target}}$$

Where MV is the market value of each company in the day before the announcement.

In our example, in the short run, we get:

$$CAR_{combined} = \frac{-4,23\%35.786MLN\$ + 3,02\%17.212MLN\$}{35.786MLN\$ + 17.212MLN\$} = -1,87\%$$

4.1.2.4 Testing whether the cumulative abnormal return is statistically different from zero

The null hypothesis to test is:

$$H_0 : \mu = 0$$

Where μ is the average abnormal return during the event window.

There are many tests to check this hypothesis; we will reject the H_0 with confidence alpha if:

$$|U| = \left| \frac{\frac{1}{|EW|} \sum_{t \in EW} \epsilon_t}{\hat{\sigma}(\epsilon) / \sqrt{|EW|}} \right| > t_{\alpha/2} (|EW| - 1)$$

Table 4-6 shows that for both stocks and for both event windows we can't reject the null hypothesis, therefore the merger is not relevant with respect to the value.

	U	t
Unicredito EW 1	-0,68553	2,423117
Unicredito EW 1	0,243911	2,328935
HVB EW 1	0,468554	2,423117
HVB EW 2	0,981311	2,328935

Table 4-6 Testing the null hypothesis for UNICREDITO and HVB



4.1.3 The main hypothesis

The method adopted is reasonable if various assumptions are met. We point out here a list, divided by category: hypothesis of the linear regression (used to estimate the parameters for the CAPM), of the CAPM and of the event study itself.

HYPOTHESIS OF THE SIMPLE LINEAR REGRESSION

- 1) Expected value of the residues is zero
- 2) Variance of the residues is finite
- 3) Residues are normally distributed

HYPOTHESIS OF THE CAPM

(http://www.valuebasedmanagement.net/methods_capm.html)

- 1) Investors are risk averse individuals who maximize the expected utility of their end of period wealth. Implication: The model is a one period model.
- 2) Investors have homogenous expectations (beliefs) about asset returns. Implication: all investors perceive identical opportunity sets. This is, everyone have the same information at the same time.
- 3) Asset returns are distributed by the normal distribution and independent.
- 4) There exists a risk free asset and investors may borrow or lend unlimited amounts of this asset at a constant rate: the risk free rate.
- 5) There is a definite number of assets and their quantities are fixed within the one period world.
- 6) All assets are perfectly divisible and priced in a perfectly competitive market.
Implication: e.g. human capital is non-existing (it is not divisible and it can't be owned as an asset).
- 7) Asset markets are frictionless and information is costless and simultaneously available to all investors. Implication: the borrowing rate equals the lending rate.
- 8) There are no market imperfections such as taxes, regulations, or restrictions on short selling

HYPOTHESIS OF THE EVENT STUDY

- 1) CAR is a proxy of the value creation
- 2) AR follows a T-student distribution



-
- 3) The variance of AR is constant
 - 4) During the event window in absence of the event the stock would have a normal outcome
 - 5) The hypothesis of the simple regression and CAPM



4.2 Regression

In statistics, regression is used to model relationships between random variables (a response (Y) and predictor(s) (X)), determine the magnitude of the relationships between variables, and to make predictions based on the models. Both the response and predictors are continuous variables.

In general the main purpose of multiple regression (the term was first used by Pearson, 1908) is indeed to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable. For example a multinational company selling a product through several countries, in order to set a different price, might record for each country the number of potential customer, the average income in the respective country or city, the composition of the population (male\female), etc. Once this information has been compiled for various countries it would be interesting to see whether and how these measures impact on the final price. For example, one might learn that the high average wage in a salary has a negative impact on the setting price and so on.. One may also detect "outliers," that is, products that should really sell for more, given their location and characteristics.

Here we will describe briefly how to conduct an analysis of this type, focusing on the main elements characterizing a regression and specifically we will present the elements we will utilize in our analysis. In the following sections we will explain briefly the different regression types.

4.2.1 Regression key features

4.2.1.1 Regression equation

The primary goal of regression analysis is to determine the values of parameters for a function that cause the function to best fit a set of data observations that you provide. This function is an algebraic representation of the regression line and is used to describe the relationship between the response and predictor variables. The regression equation takes the form of:

Response = constant + coefficient(predictor) + ... + coefficient(predictor)

or $y = b_0 + b_1X_1 + b_2X_2 + \dots + b_kX_k$



Where:

- Response (Y) is the value of the response.
- Constant (b_0) is the value of the response variable when the predictor variable(s) is zero. The constant is also called the intercept because it determines where the regression line intercepts the Y-axis.
- Predictor(s) (X) is the value of the predictor variable(s).
- Coefficients (b_1, b_2, \dots, b_k) represent the estimated change in mean response for each unit change in the predictor value. In other words, it is the change in Y that occurs when X increases by one unit.

Regression analysis purpose is to provide the line that "best" fits the data. This line can then be used to:

- examine how the response variable changes as the predictor variable changes
- predict the value of a response variable (y) for any predictor variable (x)

The method used to draw this "best line" is called the least-squares criterion. The least-squares criterion requires that the best-fitting regression line is the one with the smallest sum of the squared error terms (the distance of the points from the line).

4.2.1.2 Deviation

If a perfect fit exists between the function and the actual data, the actual value of each response in the data file would exactly equal the predicted value. Typically, however, this is not the case, and the difference between the actual value of the dependent variable and its predicted value for a particular observation is the error of the estimate which is known as the "*deviation*" or "*residual*". The goal of regression analysis is to determine the values of the parameters that minimize the sum of the squared residual values for the set of observations. This is known as a "*least squares*" regression fit.

4.2.1.3 P-values

As we have already said, linear regression examines the relationship between a response and predictor(s). In order to determine whether or not the observed relationship between the response and predictors is statistically significant, a p-value test is made. Indeed to validate the results is necessary:



- Identify the coefficient p-values: The coefficient value for P (p-value) tells whether or not the association between the response and predictor(s) is statistically significant.
- Compare the coefficient p-values to your a-level: If the p-value is smaller than the a-level selected, the association is statistically significantly. A commonly used a-level is 0.05.

4.2.1.4 R-Sq and R-Sq (adj) values

The R and adjusted R values represent the proportion of variation in the response data explained by the predictors.

- R (R-Sq) describes the amount of variation in the observed response values that is explained by the predictor(s). . R is calculated as the ratio of the sum of squares for regression over the total sum of squares. It is one of the criteria used to check whether a linear relationship between the response and the predictor fits the data well. For a single-term regression model, the greater the R, the better the model fits the data.
- Adjusted R is a modified R that has been adjusted for the number of terms in the model. If you include unnecessary terms, R can be artificially high. Unlike R, adjusted R may get smaller when you add terms to the model.

4.2.1.5 Anderson-Darling test

Anderson-Darling test is used to compare how well different distributions fit with the data set. Smaller Anderson-Darling values indicate that the distribution fits the data better. We used this test to verify if our assumption to use a linear regression was reasonable.

4.2.1.6 Durbin- Watson test

In linear regression, it is assumed that the residuals are independent of (not correlated with) one another. If the independence assumption is violated, some model fitting results may be questionable. For example, positive correlation between error terms tends to inflate the t-values for coefficients, making predictors appear significant when they may not be.

The Durbin-Watson test is a test for first-order serial correlation in the residuals of a time series regression. We used Minitab to run this test. In particular, to reach a conclusion from the test, you will need to compare the displayed statistic with lower and upper bounds in a



table. If $D >$ upper bound, no correlation exists; if $D <$ lower bound, positive correlation exists; if D is in between the two bounds, the test is inconclusive.

A value of 2.0 for the Durbin-Watson statistic indicates that there is no serial correlation.

This result is biased toward the finding that there is no serial correlation if lagged values of the regressors are in the regression.

4.2.1.7 VIF

Multicollinearity means that some predictors are correlated with other predictors, which can cause both statistical and computational difficulties. If this correlation is high, Minitab displays a warning message and continues computation. The predicted values and residuals still are computed with high statistical and numerical accuracy, but the standard errors of the coefficients will be large and their numerical accuracy may be affected. If the correlation of a predictor with other predictors is very high, Minitab eliminates the predictor from the model, and displays a message.

To identify predictors that are highly collinear, you can examine the correlation structure of the predictor variables and regress each suspicious predictor on the other predictors. You can also review the variance inflation factors (VIF), which measure how much the variance of an estimated regression coefficient increases if your predictors are correlated. If the $VIF < 1$, there is no multicollinearity but if the $VIF > 1$, predictors may be correlated. Montgomery and Peck suggest that if the VIF is between 5 and 10, the regression coefficients are poorly estimated.

4.2.1.8 F-test

In comparing two independent samples of size N_1 and N_2 the F Test provides a measure for the probability that they have the same variance.



4.2.2 Types of regression

As we have already said there are different kinds of statistic regression. In particular we can classify this technique basing on the characteristics on the function (linear or not linear regression and univariate or multi variable regression); or basing on which statistic technique is utilized to individuate the relevant data set (step wise, forward selection method and backward elimination information)

In the following section we describe briefly these two category.

4.2.2.1 Regression classification based on the type of function

Univariate versus multi variables regression

This distinction is only related to the number of predictors. A univariate regression refers to a model where a response is only influenced by one single predictor. When we have several predictors we talk of multi variable regression or multiple regression. In our work we put a big effort on multiple regression.

Linear versus not linear regression

This distinction is related to statistical method for modelling the relationship between two or more random variables using a linear equation. In *linear regression*, the function is a linear (straight-line) equation, that assumes that the best estimate of the response is a linear function of some parameters.

For example, if we assume the value of a motorbike decreases by a constant amount each year after its purchase, and for each mile it is driven, the following linear function would predict its value (the dependent variable on the left side of the equal sign) as a function of the two independent variables which are age and miles:

```
value = price + depage*age + depmiles*miles
```

where *value*, the dependent variable, is the value of the motorbike, *age* is the age of the motorbike, and *miles* is the number of miles that the vehicle has been driven. The regression analysis performed will determine the best values of the three parameters, *price*, the estimated value when age is 0 (i.e., when the car was new), *depage*, the depreciation that takes place



each year, and *depmiles*, the depreciation for each mile driven. The values of *depage* and *depmiles* will be negative because the motorbike loses value as age and miles increase.

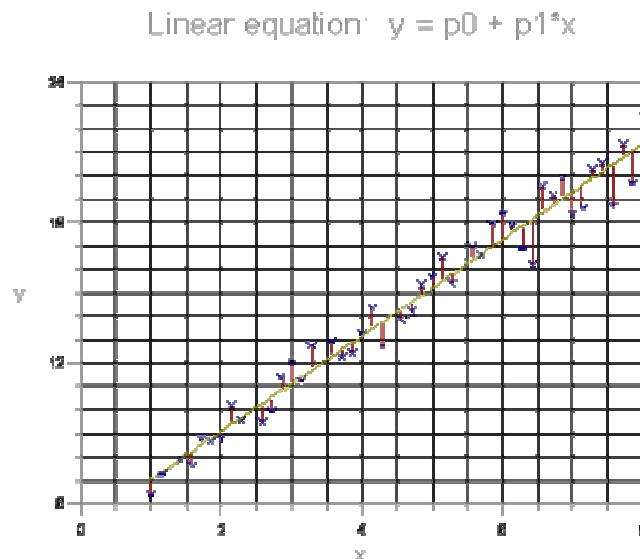
For an analysis like this example, it is necessary to provide a data file containing the values of the dependent and independent variables for a set of observations. In this example each observation data record would contain three numbers: value, age, and miles, collected from used motorbike ads for the same model. The more observations you provide, the more accurate will be the estimate of the parameters.

Once the values of the parameters are determined, you can use the formula to predict the value of a motorbike based on its age and miles driven. For example, if the model computed a value of 16000 for *price*, -1000 for *depage*, and -0.15 for *depmiles*, then the function will be:

$$\text{value} = 16000 - 1000 \cdot \text{age} - 0.15 \cdot \text{miles}$$

and it could be used to estimate the value of a motorbike with a known age and number of miles.

Here is a plot of a linear function fitted to a set of data values.(see graph 4-2) The actual data points are marked with "x". The red line between a point and the fitted line represents the residual for the observation.



graph 4-2, example of linear equation



How it can be easily seen from the graph above this example was a simple linear regression. But there are several others types of regression: polynomial, exponential, logistic, and general nonlinear regression. It depends on the form of the function that better fit to the data, and the function may include nonlinear terms such as variables raised to powers and library functions such as log, exponential, sine, etc..

Just to make an example of nonlinear regression, we consider another depreciation problem. The value of a used helicopter decreases for each year of its age. Assuming the value of a plane falls by the same amount each year, a linear function relating value to age is:

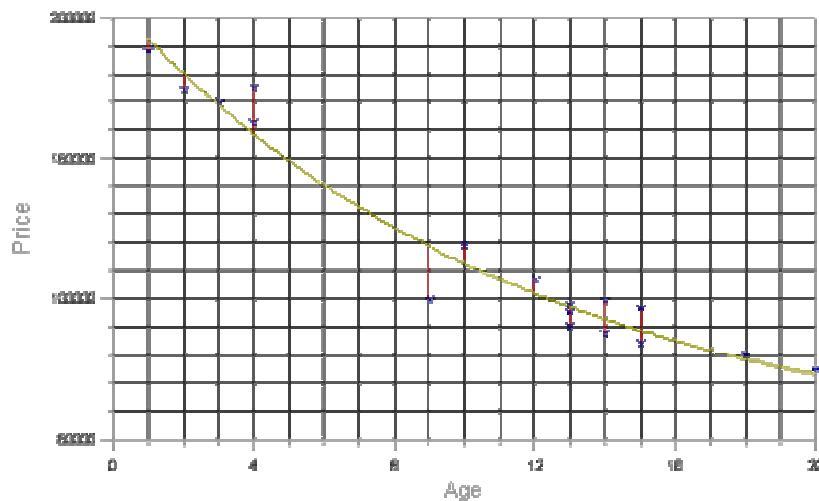
```
value = p0 + p1*Age
```

Where $p0$ and $p1$ are the parameters whose values are to be determined. However, it is a well-known fact that helicopter lose more value the first year than the second, and more the second than the third, etc. This means that a linear (straight-line) function cannot accurately model this situation. A better, nonlinear, function is:

```
value = p0 + p1*exp(-p2*Age)
```

Where the "exp" function is the value of e (2.7182818...) raised to a power. This type of function is known as "negative exponential" and is appropriate for modelling a value whose rate of decrease is proportional to the difference between the value and some base value. Here is a plot of a negative exponential function fitted to a set of data values. (see graph 4-3)

Negative exponential model: Price versus age



graph 4-3, example of non linear equation



Here we write down some examples of functions that can be regressed:

Linear:	$Y = p_0 + p_1 \cdot X$
Quadratic:	$Y = p_0 + p_1 \cdot X + p_2 \cdot X^2$
Multivariate:	$Y = p_0 + p_1 \cdot X + p_2 \cdot Z + p_3 \cdot X \cdot Z$
Exponential:	$Y = p_0 + p_1 \cdot \exp(X)$
Periodic:	$Y = p_0 + p_1 \cdot \sin(p_2 \cdot X)$
Misc:	$Y = p_0 + p_1 \cdot Y + p_2 \cdot \exp(Y) + p_3 \cdot \sin(Z)$

In other words, the function is a general expression involving one dependent variable (on the left of the equal sign), one or more independent variables, and one or more parameters whose values are to be estimated. In our work we focus only on linear regressions.

4.2.2.2 Regression classification based on the technique utilized to select the data

In order to create a model, we have to identify the variables that have a relevant impact on the response. For instance if we have a initial set of variables we have to remove and add variables to the regression model for identifying a useful subset of the predictors. MINITAB, the software we used to run this analysis, provides three commonly used procedures:

- standard stepwise regression (adds and removes variables)
- forward selection (adds variables)
- backwards elimination (removes variables)

MINITAB is a powerful statistical software package for analyzing data and presenting results. It provides a wide range of statistical procedures and graphics capabilities. MINITAB has a very friendly interface. Most tasks can be performed by using menus and selecting options in dialog boxes.

Stepwise regression

Stepwise regression is a procedure that generates a model by including variables in or excluding variables from the model based on the specified Alpha-to-Enter and Alpha-to-Remove value. In particular Alpha-to-Enter is the value that determines if any of the predictors not currently in the model should be added to the model, while Alpha-to-Remove is the value that determines if any of the predictors in the model should be removed from the model.



If for instance we fix the Alpha-to-Enter and Alpha-to-Remove are 0.15, at each step of the procedure, a predictor is added to the model, if it has the smallest p-value among those predictors with p-values less than 0.15. Similarly, at each sequential step of the procedure, a predictor is removed from the model if it has the largest p-value among those predictors with p-values greater than 0.15.

Forward selection method

Stepwise regression using the forward selection method generates a model by including variables in the model based on the specified Alpha-to-Enter. In forward selection, once a predictor is entered into the model, it is never removed from the model.

Backward elimination information

The backward elimination method of stepwise regression starts with the model that contains all the predictors. Predictors are removed one at a time according to a specified Alpha-to-Remove. For the backward elimination method, once a predictor is removed from the model, it is never entered again.

4.2.3 Our work

When and why we use a regression analysis?

In our work we have utilized a regression model in two occasions, in the event study section and in the identification of the variables who impact on the merger value creation.

Event study

In order to identify abnormal returns we created, a model to estimate the normal returns, that is the returns which we expect if no external extraordinary circumstances occur.

To create this model we use in input the share value of the acquired company in the previous 250 days before the announcement (k_E), and the rendering of the risk free bonds(r_f), and the return index representing the market.

In fact, according to the *Capital Asset Pricing Model*, is given by:

$$k_E = r_f + \beta(r_M - r_f)$$



Thanks to this input and to a linear regression technique, we estimated the independent variable β and the parameter α that is calculated from the equation above ($r_f - \beta r_f$).

In the section event study further details are presented.

Identifying key variables

The main goal of our thesis was to identify variables that have a relevant impact on the value creation (measured by CAR), and to create a model to forecast the value of a new deal. We utilize a multiple linear regression to test several variables that may explain the value creation . The variables tested are the ones described in the previous chapter and shown in attachment D. The outcome of this analysis will be reported in the following chapter.

In the previous table, in additions to all the elements presented before(p-value, r-sq,...), we have also two further voices: proportion correct and proportion correct with CV (cross validation). These probabilities refers to the capacity of the predictors to forecast if the target/bidder will get a positive CAR or not, trough a model resulting from a discriminatory analysis... In particular proportion of correct , refers to the case in which we use for forecasting the response the same *training set* we used to construct the model, while in the second case with CV, some new deals, that were not contemplated in the training set, are added.



4.3 Factor analysis

4.3.1 General Purpose

The main applications of factor analytic techniques are: (1) to *reduce* the number of variables and (2) to *detect structure* in the relationships between variables, that is to *classify variables*. Therefore, factor analysis is applied as a data reduction or structure detection method (the term *factor analysis* was first introduced by Thurstone, 1931).

The topics listed below will describe briefly the principles of factor analysis, and how it can be applied towards these two purposes.

4.3.1.1 Basic Idea of Factor Analysis as a Data Reduction Method

Suppose we want to measure people's satisfaction with their working lives. We design a satisfaction questionnaire with various items; among other things we ask our subjects how satisfied they are with their works (item 1) and how intensely they are working (item 2). Most likely, the responses to the two items are highly correlated with each other. Given a high correlation between the two items, we can conclude that they are quite redundant. Combining Two Variables into a Single Factor. One can summarize the correlation between two variables in a scatter plot. A regression line can then be fitted that represents the "best" summary of the linear relationship between the variables. If we could define a variable that would approximate the regression line in such a plot, then that variable would capture most of the "essence" of the two items. Subjects' single scores on that new factor, represented by the regression line, could then be used in future data analyses to represent that essence of the two items. In a sense we have reduced the two variables to one *factor*. Note that the new factor is actually a linear combination of the two variables.

The example described above, combining two correlated variables into one factor, illustrates the basic idea of factor analysis. If we extend the two-variable example to multiple variables, then the computations become more involved, but the basic principle of expressing two or more variables by a single factor remains the same.

Now a new question arise: how to identify these *factors*?



As we have already said we want to reduce the number of variables but at the same time we don't want to loose important information. Indeed in order to identify reasonable factors, an analysis of correllance among our variables is made, and between our variables and new factors (created basing on the correlations among the variables) .

In order to identify the relevant factors we used the software Minitab. In particular thanks to this software it is possible to determine directly the underlying factors responsible for correlations in the data. Further Minitab displays a “loading matrix” (see attachment E). This table is a very useful tool in order to understand how much a factor explains a variable. High loadings (positive or negative) indicate that the factor is strongly influenced by the variable. Low loadings (positive or negative) indicate that the factor is weakly influenced on the variables. Examine the loading pattern to determine on which factor each variable loads. Some variables may load on multiple factors.

The results of this analysis will be presented in the following chapter.



4.4 Univariate analysis

In order to estimate the importance and the impact on each variable on the value creation (measured by CAR), we conduct in parallel to a multivariable regression methodology, a simple univariate static analysis. Following Hawawini and Swary (Hawawini 1990) and Patrick Beitel, Dirk Schiereck, and Mark Wahrenburg, (Beitel (2003)) each of the variables is tested using comparative static analysis, that means that we run a separate experiment for each variable, without caring about the interrelation between different variables. In other words we analyze if and how a variable impact on the value creation, that is, for each variable we pick all the observation with a particular high value, and we compare their CAR with the one of the observations characterized by a low value.

In particular for each variable we compare the top 30 value versus the bottom 30 and we see how two different sample impact on the value creation. table 5-4 summarizes the drivers/variables, which we illustrated in the previous chapter and which we will explain in the following chapter. As an example, we investigate whether abnormal returns to shareholders are different when targets exhibit a very high or very low total asset growth. The results, reported in the table below, shows as there is a significant difference in the CAR of the two subgroups, and that means that this variable play an important role in the value creation. In particular we separately test abnormal returns of bidders, targets, and the combined entities of bidders and targets.

For the special case of binary variables we split the sample in two sub-samples and test for differences between the sub-samples. Just to make an example the Boolean variable cross border (1 if the operation is cross border, 0 if is a domestic deal), allow us to divide all the operations in two subgroup of respectively 26 observation (cross border deals) and 119 (domestic ones).

As we have already said we use this comparative technique in order to help to identify whether an identified driver of M&A-success has explanatory power, but, even if this static analysis gives us some general useful information, the presence of interaction limits the generalizability of main effects. This is because it is difficult to make a general statement about a variable's effect when the size of the effect depends on the level of a several others



variables. That is the reason because we used this technique mainly as a verify of the outcome generated by other methodologies we used. In fact thank to this analysis, it is possible to see if there are some outliers, some values that are strange and that could signal us a possible error.



4.5 Discriminant analysis

Discriminant analysis (DA) is a technique to classify a set of observations into predefined classes. This technique creates a predictive model of group membership based on observed characteristics of each case. For example, theoretically, it could be possible to create a model to predict whether people vote Berlusconi or Prodi from a knowledge of their age, their class, attitudes, values etc etc.

Discriminant analysis is similar to multiple regression because both techniques use two or more predictor variables and a single response variable. However, in discriminant analysis, the response variable is categorical. Examples of categorical variables are gender, colour, and operational status. In order to run a discriminant analysis we used the software MINITAB.

In general *Discriminant Analysis* is a very useful tool for detecting the variables that allow the researcher to discriminate between different groups, and for classifying cases into different groups with a better than chance accuracy.

The model is built based on a set of observations for which the classes are known. This set of observations is sometimes referred to as “*the training set*”. Based on the training set , the technique constructs a set of linear functions of the predictors, known as *discriminant functions*, such that $L = b_1x_1 + b_2x_2 + \dots + b_nx_n + c$, where the b 's are discriminant coefficients, the x 's are the input variables or predictors and c is a constant. These discriminant functions are used to predict the class of a new observation with unknown class. In fact the functions can then be applied to new cases with measurements for the predictor variables but unknown group membership. When there are two groups, only one discriminant function is generated. When there are more than two groups, several functions will be generated. For a k class problem, k discriminant functions are constructed. Given a new observation, all the k discriminant functions are evaluated and the observation is assigned to class i if the i^{th} discriminant function has the highest value.

To summarize the discussion, the basic idea underlying discriminant function analysis is to determine whether groups differ with regard to the mean of a variable, and then to use that variable to predict group membership (e.g., of new cases).



4.5.1 Types of Discriminant Analysis

There are basically three types of DA: **direct**, **hierarchical** and **stepwise**. In **direct** DA, all the variables enter at once; in **hierarchical** DA, the order of variable entry is determined by the researcher; and in **stepwise** DA, statistical criteria alone determine the order of entry. In our work we used stepwise DA.

4.5.1.1 Stepwise Discriminant Analysis

Probably the most common application of discriminant function analysis is to include many measures in the study, in order to determine the ones that discriminate between groups. For example, the Italian minister of education could be interested in predicting which kind of university the current high school students will attend and he would probably include features such as current education, achievement motivation, academic performance, family backgrounds.. etc. as possible in order to learn which one(s) offer the best prediction. In particular we want to build a "model" of how we can best predict to which group a case belongs.

Stepwise discriminant analysis can be further divided in 3 sub categories.

- **Forward stepwise analysis.** In stepwise discriminant function analysis, a model of discrimination is built step-by-step. Specifically, at each step all variables are reviewed and evaluated to determine which one will contribute most to the discrimination between groups. That variable will then be included in the model, and the process starts again.
- **Backward stepwise analysis.** In this case all variables are included in the model and then, at each step, the variable that contributes least to the prediction of group membership is eliminated. Thus, as the result of a successful discriminant function analysis, one would only keep the "important" variables in the model, that is, those variables that contribute the most to the discrimination between groups.
- **F to enter, F to remove.** The stepwise procedure is "guided" by the respective *F* to enter and *F* to remove values. The *F* value for a variable indicates its statistical significance in the discrimination between groups, that is, it is a measure of the extent to which a variable makes a unique contribution to the prediction of group membership.



4.5.2 Assumptions

Some assumptions are required in order to validate the results. Here we briefly sum up these assumptions.

- **Normal distribution.** It is assumed that the data represent a sample from a multivariate normal distribution. It is possible to examine whether or not variables are normally distributed with histograms of frequency distributions. However, note that violations of the normality assumption are usually not "fatal," meaning, that the resultant significance tests etc. are still "trustworthy."
- **Homogeneity of variances/covariances.** It is assumed that the variance/covariance matrices of variables are homogeneous across groups. Again, minor deviations are not that important; however, before accepting final conclusions for an important study it is probably a good idea to review the within-groups variances and correlation matrices. In particular a scatter plot matrix can be produced and can be very useful for this purpose. When in doubt, a solution could be for instance re-running the analyses excluding one or two groups that are of less interest.
- **Correlations between means and variances.** The major "real" threat to the validity of significance tests occurs when the means for variables across groups are correlated with the variances (or standard deviations). Intuitively, if there is large variability in a group with particularly high means on some variables, then those high means are not reliable. In practice, this pattern may occur if one group in the study contains a few extreme outliers, who have a large impact on the means, and also increase the variability. To guard against this problem, is important to inspect the means and standard deviations or variances for such a correlation.
- **The matrix ill-conditioning problem.** Another assumption of discriminant function analysis is that the variables that are used to discriminate between groups are not completely redundant. If any one of the variables is completely redundant with the other variables then the matrix is said to be *ill-conditioned*, and it cannot be inverted. For example, if a variable is the sum of three other variables that are also in the model, then the matrix is ill-conditioned.
- **Tolerance values.** In order to guard against matrix ill-conditioning, is important to check constantly the so-called tolerance value for each variable. This tolerance value is computed as *1 minus R-square* of the respective variable with all other variables included in the current model. Thus, it is the proportion of variance that is unique to



the respective variable. In general, when a variable is almost completely redundant (and, therefore, the matrix ill-conditioning problem is likely to occur), the tolerance value for that variable will approach 0.

4.5.3 Discriminant analysis to forecast classification

As we have already said a discriminant analysis is an useful tool for predicting classification of cases. Once a model has been finalized and the discriminant functions have been derived, how well can we *predict* to which group a particular case belongs?

There are basically two different types of predictions: *A priori* and *post hoc* predictions. Before going into the details of different estimation procedures, we would like to make sure that this difference is clear. Obviously, if we estimate, based on some data set, the discriminant functions that best discriminate between groups, and then use the *same* data to evaluate how accurate our prediction is, then it is very likely that the results will be good. In general, one will *always* get a worse classification when predicting cases that were not used for the estimation of the discriminant function. Put another way, *post hoc* predictions are always better than *a priori* predictions. (The trouble with predicting the future *a priori* is that one does not know what will happen; it is much easier to find ways to predict what we already know has happened.) Therefore, one should never base one's confidence regarding the correct classification of future observations on the same data set from which the discriminant functions were derived; rather, if one wants to classify cases predictively, it is necessary to collect new data to "try out" (cross-validate) the utility of the discriminant functions.

4.5.3.1 Classification functions.

These are not to be confused with the discriminant functions. The classification functions can be used to determine to which group each case most likely belongs. There are as many classification functions as there are groups. Each function allows us to compute *classification scores* for each case for each group, by applying the formula:

$$S_i = c_i + w_{i1} * x_1 + w_{i2} * x_2 + \dots + w_{im} * x_m$$

In this formula, the subscript *i* denotes the respective group; the subscripts *1, 2, ..., m* denote the *m* variables; *c_i* is a constant for the *i*'th group, *w_{ij}* is the weight for the *j*'th variable in the computation of the classification score for the *i*'th group; *x_j* is the observed value for the respective case for the *j*'th variable. *S_i* is the resultant classification score.



We can use the classification functions to directly compute classification scores for some new observations.

4.5.3.2 *Classification of cases.*

Once we have computed the classification scores for a case, it is easy to decide how to classify the case: in general we classify the case as belonging to the group for which it has the highest classification score. Thus, if we were to study high school students' post-graduation career/educational choices (e.g., attending college, attending a professional or trade school, or getting a job) based on several variables assessed one year prior to graduation, we could use the classification functions to predict what each student is most likely to do after graduation. However, we would also like to know the *probability* that the student will make the predicted choice. Those probabilities are called *posterior* probabilities, and can also be computed. However, to understand how those probabilities are derived, let us first consider the so-called *Mahalanobis* distances.

Mahalanobis distances. The Mahalanobis distance is a measure of distance between two points in the space defined by two or more correlated variables. For example, if there are two variables that are uncorrelated, then we could plot points in a standard two-dimensional scatter plot; the Mahalanobis distances between the points would then be identical to the Euclidean distance; that is, the distance as, for example, measured by a ruler. If there are three uncorrelated variables, we could also simply use a ruler (in a 3-D plot) to determine the distances between points. If there are more than 3 variables, we cannot represent the distances in a plot any more. Also, when the variables are correlated, then the axes in the plots can be thought of as being *non-orthogonal*; that is, they would not be positioned in right angles to each other. In those cases, the simple Euclidean distance is not an appropriate measure, while the Mahalanobis distance will adequately account for the correlations.

Mahalanobis distances and classification. For each group in our sample, we can determine the location of the point that represents the means for all variables in the multivariate space defined by the variables in the model. These points are called group *centroids*. For each case we can then compute the Mahalanobis distances (of the respective case) from each of the group centroids. Again, we would classify the case as belonging to the group to which it is closest, that is, where the Mahalanobis distance is smallest.

Posterior classification probabilities. Using the Mahalanobis distances to do the classification, we can now derive probabilities. The probability that a case belongs to a



particular group is basically proportional to the Mahalanobis distance from that group centroid. Because we compute the location of each case from our prior knowledge of the values for that case on the variables in the model, these probabilities are called *posterior* probabilities. In summary, the posterior probability is the probability, based on our knowledge of the values of other variables, that the respective case belongs to a particular group. Some software packages will automatically compute those probabilities for all cases.

A priori classification probabilities. There is one additional factor that needs to be considered when classifying cases. Sometimes, we know ahead of time that there are more observations in one group than in any other; thus, the *a priori* probability that a case belongs to that group is higher. For example, if we know ahead of time that 60% of the graduates from our high school usually go to college (20% go to a professional school, and another 20% get a job), then we should adjust our prediction accordingly: *a priori*, and all other things being equal, it is more likely that a student will attend college than choose either of the other two options. You can specify different *a priori* probabilities, which will then be used to adjust the classification of cases (and the computation of posterior probabilities) accordingly. In practice, the researcher needs to ask him or herself whether the unequal number of cases in different groups in the sample is a reflection of the true distribution in the population, or whether it is only the (random) result of the sampling procedure. In the former case, we would set the *a priori* probabilities to be proportional to the sizes of the groups in our sample, in the latter case we would specify the *a priori* probabilities as being equal in each group. The specification of different *a priori* probabilities can greatly affect the accuracy of the prediction.

At the end of each prediction, a common result that one looks at in order to determine how well the current classification functions predict group membership of cases is the *classification matrix*. The classification matrix shows the number of cases that were correctly classified (on the diagonal of the matrix) and those that were misclassified.



5 General data description and static analysis

In this chapter we will explain how we selected the data set we used for our analysis, then we will briefly describe the main characteristics of this sample and we will conclude showing the results for the statistic analysis



5.1 Steps of our work

The purpose of our work was to analyse the principal mergers and acquisitions deals in the financial industry around the entire world and determine if they were characterized by a value creation.

The first challenge we faced was to individuate a relevant sample in order to run our analysis. In particular we decided to focus on the last 6 years, in order to limit the dimension of our sample.

Once we decided the “time window”, we looked for all the operations characterising this period of time. The list and the main characteristics of the deals occurred during the selected window was provided by Thomson Financial. Bank of Italy kindly allowed us to access that database. In particular the list of operations includes the following information:

- M&A type:
 - Merger
 - Acquisition
 - Buyback
 - Acquisition partial
 - Acquisition majority
 - Acquisition of asset
 - Exchange offer
- Status:
 - Completed
 - Rumour
 - Intended
 - Partial completed
 - Pending
 - Unconditional
 - Withdrawn



This data set was composed by 4338 deals characterizing the financial industry. In particular for the financial industry we utilized the definition given by Thomson financial, which splits up the financial industry into the following sub categories:

- Commercial Banks, Bank Holding Companies (DA)
- Savings and Loans, Mutual Savings Banks (DB)
- Credit Institutions (DC)
- Real Estate; Mortgage Bankers and Brokers (DD)
- Investment & Commodity Firms/Dealers/Exch.(DE)
- Insurance (DF)
- Other Financial (DG)

As can be easily imagined this data set was too huge for our analysis: we had to decide how to narrow the initial data set. First of all we decided to focus only on merger deals. The distinction between a merger and an acquisition is somewhat vague.

A merger is often defined as a transaction where one entity is combined with another so that at least one initial entity loses its distinct identity. Thus, full integration of the two firms takes place and control over a single entity can easily be exercised.

An acquisition is often classified as a transaction where one firm purchases a controlling stake of another firm without combining the assets of the firms involved.

Relative to acquisitions, mergers provide a greater level of control, because there is only one corporate entity to manage. Acquisitions are most appropriate when there are operational, geographic or legal reasons to maintain separate corporate structures (Federal Reserve (2006)).

We have decided to focus on mergers in order to restrict the huge number of deals characterizing the period between 2000-2005 and because, usually the reasons to undertake a merger are different from the ones to undertake an acquisition, and as a consequence the results could be different. In fact, mergers, which involve significant organizational problems



in integrating two independently run firms, can be expected to differ in goals from acquisitions, which in our definition involve only a transfer of control¹⁴.

Thanks to this first selection the number of operation in our data set decreased drastically to 1131 deals, but still a number too high for our analysis.

We therefore decided to strict further our sample. We chose to analyse all the domestic operation characterized by a deal value higher than 500 millions dollar, and cross border deals characterized by a deal value higher than 100 millions. This is an arbitrary value decided in order to have a reasonable data set. In particular we chose to lower the deal value for cross border operation, because otherwise the number of international operation was too low, due to, as we saw in the first chapter, the fact that cross border deals in financial sector are generally smaller than domestic ones.(see graph 5-2)

After this further selection the number of the deals was reduced to 237.

Finally we considered only the operation with announcement date after the bubble asset (31-3-2000), because in this way we got a homogeneous sample, not too influenced by external factors.

At the end of this selection process we had an initial data set composed by 218 operations, a reasonable number for our following analysis.

The following step was to identify for each deal the information (described in the previous chapters) we needed for our analysis. In particular we used the software DATASTREAM to search for balance sheet information and the share price around the announcement date of the deals. Certain ratios were not being provided by DataStream, therefore we calculated them basing on the extracted data

¹⁴ According to “why do banks merge ?”,Focarelli ,Pannetta and Salleo,1999 “mergers are driven by strategies aimed at selling more services: the bidder, which has on average a high level of income from services, is interested in offering its broader range of products to the customers of the target, who are underserved.

Acquisitions, by contrast, can be traced back to strategies based on credit management: the aim of the acquiring banks, which have larger loan portfolios than banks that do not take part in any deal, is to improve the quality of the portfolio of the acquired banks, which also have more loans but with a higher-than-average bad loans ratio”.



In some cases the information was not available in DataStream and we looked for it directly in the published balance of each company. At the end of the process of data collection we were able to calculate the CAR for 145 large M&A operations.

In the following section we'll present the main characteristics of the data set individuated.



5.2 Characteristics of our data set

In this section we will briefly describe the main characteristics of our sample. table 5-1 presents an overview of the identified transactions, while attachment B shows our dataset with all the information we collected.

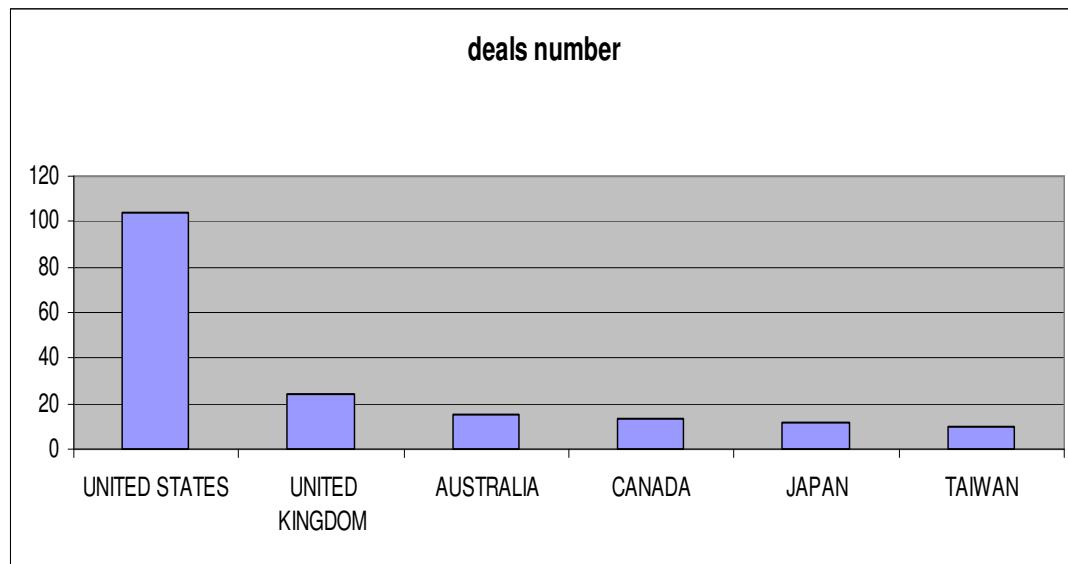
year	average value for transaction (\$mil)	number of transactions	geographical focus		product activity focus	
			domestic	cross border	same sub sector	cross sub sector
2000	4241,6	47	29	18	35	12
2001	5034,4	43	30	13	26	17
2002	2381,6	23	18	5	16	7
2003	2733,1	30	24	6	23	7
2004	3509,4	42	36	6	35	7
2005	5604,2	33	23	10	20	13
total	3917,4	218	160	58	155	63
(in %)		100,00%	73,39%	26,61%	71,10%	28,90%

table 5-1, general information on our dataset, source: elaboration of our database

5.2.1 Geographical diversification

How can be seen from the attachment B and graph 5-1 ,our sample includes deals among institutions from the entire world. In particular there are 6 countries that in the last few years played a key role in the M&A process, counting for the 70 percent (in number) of our sample: United States, United Kingdom, Australia, Japan, Canada and Taiwan. The graph 5-1 shows the number of deals in which at least one between bidder and target is one of these 6 countries.

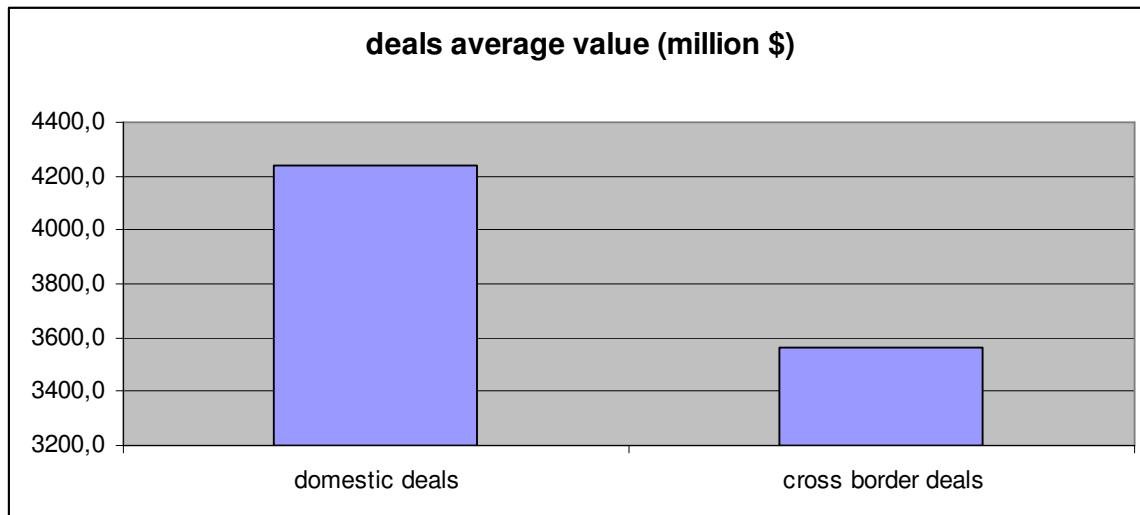




graph 5-1, number of operations, source: elaboration of our database

Most of the operations, as predicted, are domestic. In our data set the cross border operations are 40, representing the 20% of the entire sample. This data is coherent with the literature analysed and with the percentage of cross border deals in the initial data set. (590 of 4338, representing the 14 %).

Further, confirming the literature, in our sample domestic deals are on average bigger than cross border ones. (see graph 5-2)



graph 5-2, deals value, source: elaboration of our dataset



Finally in our sample is it possible to see that there are countries more open, where cross border operations are more likely (as United Kingdom), and that probably there are clusters, within most of the operations characterizing these countries are undertaken (as Belgium, Netherlands .) (see table 5-2)



TARGET**BIDDER**

	AS	AU	BE	BL	CA	CE	CH	DN	ES	FN	FR	GL	GR	HK	IN	IR	IT	JP	LT	LX	MA	MX	NO	NT	NZ	PH	PR	SA	SG	SK	SP	SW	SZ	TH	TW	UK	US	WG	TOT
Austria																																		0	15				
Australia																																		0	0				
Bermuda																																		1	1				
Belgium																																		1	1				
Canada																																		1	1				
Chile																																		1	1				
China																																		1	1				
Denmark																																		2	2				
El Salvador																																		1	1				
Finland																																		1	1				
France																																		1	8				
Greenland																																		0	0				
Greece																																		-1	-1				
Hong Kong																																		1	1				
India																																		1	1				
Ireland																																		0	0				
Italy																																		1	1				
Japan																																		6	6				
Lithuania																																		12	12				
Luxembourg																																		0	0				
Malaysia																																		2	2				
Mexico																																		2	2				
Norway																																		3	3				
Netherlands																																		5	5				
New Zealand																																		0	0				
Philippines																																		2	2				
Puerto Rico																																		2	2				
South Africa																																		4	4				
Singapore																																		1	1				
South Korea																																		2	2				
Spain																																		1	1				
Sweden																																		5	5				
Switzerland																																		3	3				
Thailand																																		1	1				
Taiwan																																		9	9				
United Kingdom																																		17	17				
United States																																		85	89				
Germany																																		1	1				
	1	11	1	0	7	1	1	2	1	0	9	1	1	3	1	2	4	12	1	1	2	4	6	1	0	2	4	3	0	3	1	1	9	14	100	3	218		

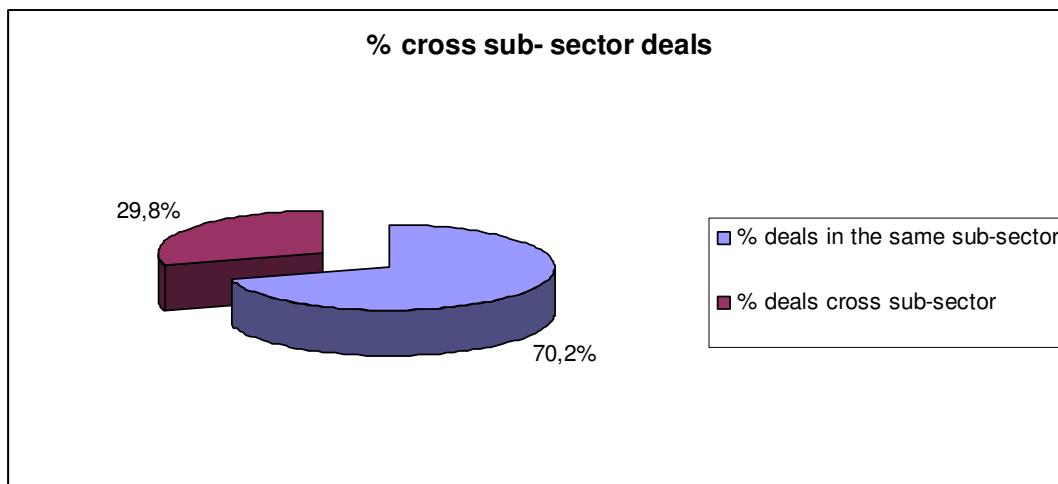
table 5-2, deals by countries, source: elaboration of our database



5.2.2 Segment diversification

Our sample includes operations among institutions of all the sub financial categories presented above. As in the geographic diversification, it is interesting to see how there are few specific segments that count for more than 70% (in number) within all the deal analysed. In this case the sub sector DA (Commercial Banks, Bank Holding Companies) and DE (Investment & Commodity Firms/Dealers/Exch.) dominate the scene

As before most of the operations are between two institutions in the same sub sector. (see graph 5-3 and table 5-3)



graph 5-3, proportion of cross border deals, source: elaboration of our data

Original dataset

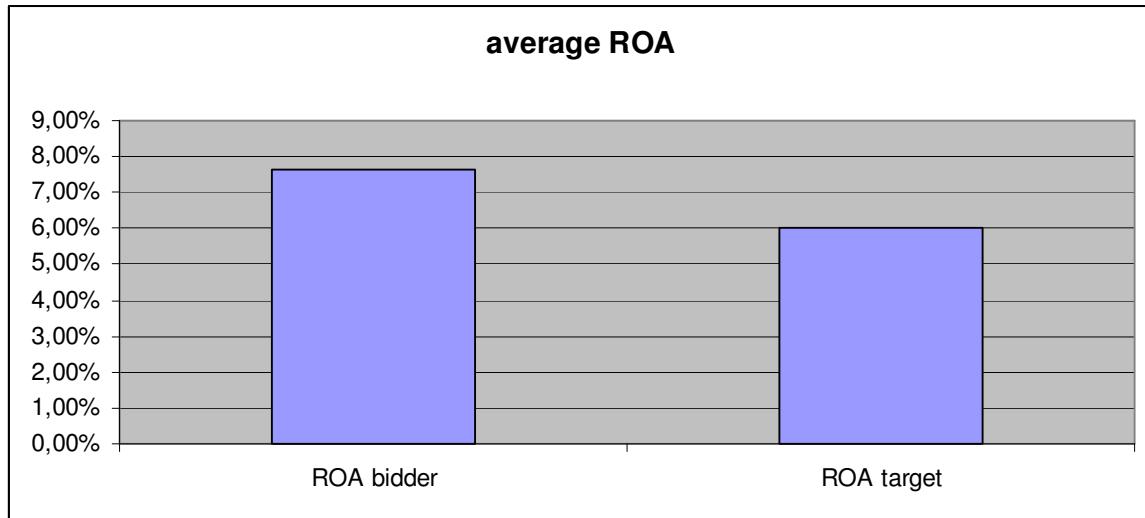
BIDDER			TARGET							TOT
			DA	DB	DC	DD	DE	DF	DG	
	Commercial Banks, Bank Holding Companies	DA	70	8	4	2	12	2		98
	Savings and Loans, Mutual Savings Banks	DB	2	7	1					10
	Credit Institutions	DC	3		1					4
	Real Estate; Mortgage Bankers and Brokers	DD	1		1	4	5			11
	Investment & Commodity Firms/Dealers/Exch.	DE	8			7	42	3		60
	Insurance	DF	1		1		3	29		34
	Other Financial	DG					1			1
	TOT		85	15	8	13	63	34	0	218

table 5-3, deals by financial segments, source: elaboration of our database



5.2.3 Further general characteristics

As can be seen from the table 5-1 the average transaction volume of the operation analysed is 3,91 billions of dollars. The bidder is on average 12,4 bigger than the target (source: elaboration of our dataset) and has a higher ROA. (see graph 5-4)



graph 5-4, ROA, source: elaboration of our dataset

5.2.4 Value creation

According to the previous literature, the average CAR of the target within 30 days is statistic relevant and positive (+ 13,44%), while the average CAR of the bidder is negative (-2,98%). (see table 5-4)

The combined CAR, that is the value creation for the combined entity, is approximately zero (+0,08%), that means that on average there is no value creation but there is a transfer of value from bidder to target.

There is no significant difference between the results in the first event window and in the second.



		N	Mean	StDev	Minimum	Maximum
(-10;+10)	CAR Target	145	14,18%	0,165	-30,33%	74,05%
	CAR Bidder	145	-2,24%	0,07261	-25,59%	34,10%
	CAR combined	145	0,74%	0,06832	-17,19%	34,02%
	Added Value (millions \$)	145	-302,0	2.519,0	-18.312,0	6.081,0
(-10;+30)	CAR Target	145	13,44%	0,1739	-23,78%	76,79%
	CAR Bidder	145	-2,98%	0,09667	-34,56%	34,02%
	CAR combined	145	0,08%	0,08646	-26,11%	33,13%
	Added Value (millions \$)	145	-387,0	3.685,0	-29.589,0	7.312,0

table 5-4, final results, source: elaboration of our database

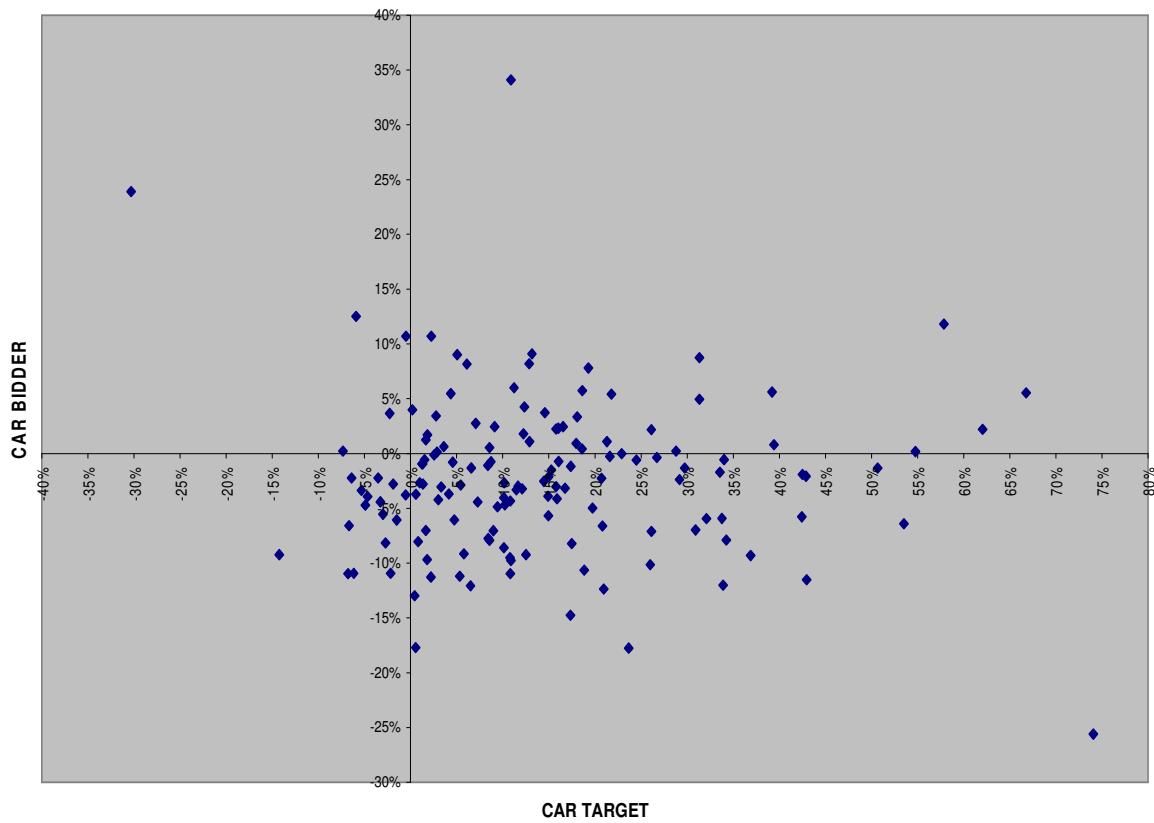


table 5-5, CAR plots, source: elaboration of our dataset



5.3 Comparative static

In this paragraph we provide a static analysis in order to verify whether an identified driver of M&A success has explanatory power. As we have already mentioned in this analysis we don't care about the interrelations among different variables, and therefore is quite difficult to generalize the results. The main purpose of this analysis will be indeed to verify if similar results to the event study analysis are obtained and check if some outlier values exist.

In particular we will analyse the impact of the variables on the CAR 10 days of the target, of the bidder and the total CAR. Attachment C.1, C.2 and C.3 summarize the drivers.

In the following sections we will describe the results obtained with this technique, for the main variables, that is the ones that have a major impact on the value creation (where the Car difference between the top 30 and the bottom 30 is higher), grouped in general categories.

5.3.1 Characteristics of the country of the target.

This general category refers to the general external conditions of the country of the target. In particular in this general indicator we put the following variables:

- Financial institution transparency
- Legal quality
- Regulation intensity
- Central bank transparency
- Bank regulation
- Risk of political instability
- Transparency of the government
- Credit flow
- Efficiency of banking system
- Bribery and corruption

In general the results show that the higher is the quality system (transparency, regulation and so on), the better are the returns for the target and the higher is the general value creation for the combined entity. In general we can explain this outcome saying that is if the target country



is well regulated, the risk for the bidder is lower and indeed he is disposed to pay a higher price for a less risky deal.

Most of the variable in this category results significant in the value creation (the exception are central bank transparency and efficiency of the banking system), but the most important and relevant variable for the combined value creation is “transparency of the government”. In particular the top 30 transactions show an abnormal return of 3%, while the bottom 30 deals show a negative abnormal return of 0,641%. This outcome is coherent with the literature and the regression analysis. In fact as we said before, a country characterized by a high government transparency, has a positive impact on the value creation, mainly due to a general decrease of the risk of operation. The results for each single variable are shown in Attachment C.1, C.2 and C.3

5.3.2 Diversification between the country of the target and of the bidder

This category refers to the differences among different countries. Differently from the previous one is that, here we consider the distance between two countries and we do not focus anymore only on the target side.

In particular it includes the following simple variables:

- Cultural distance
- Financial system distance
- Economic distance
- Political distance
- Financial legal system
- General legal system
- Fiscal distance

In general the more two countries are different and distant, the more the diversification is high. But which impact does the diversification have on the value creation? Our work confirms the previous analysis, showing that generally a diversification has a negative impact on value creation. In fact with regard to the synergy hypothesis we expect bidding banks to be more successful in focused transaction. However, none of this variable appears highly statistically relevant for the combined value creation.



5.3.3 Method of payment

The method of payment, confirming the previous work (Travlos (1987)), is an important factor for M&As success. With the method of payment the bidder sends a signal to the market. The bidder may disclose private information (about how the bidder perceives the value of their stocks) that may not be reflected in the stock price so far. In particular if a bidder pays for with stock he perceives the stock to be cheaper than cash than cash thus signalling to the market that the stocks are over evaluated or vice versa. Accordingly to that, we should observe a negative announcement effect for pure stock transactions. Therefore the target shareholders prefer cash. The price adjustment related to the method of payment, however, may only be an additional effect which unfortunately can not be distinguished from other external adjustment. The following tables show the results we obtained. Consistently with our expectations targets return and in general combined return are higher when the cash ratio is high.

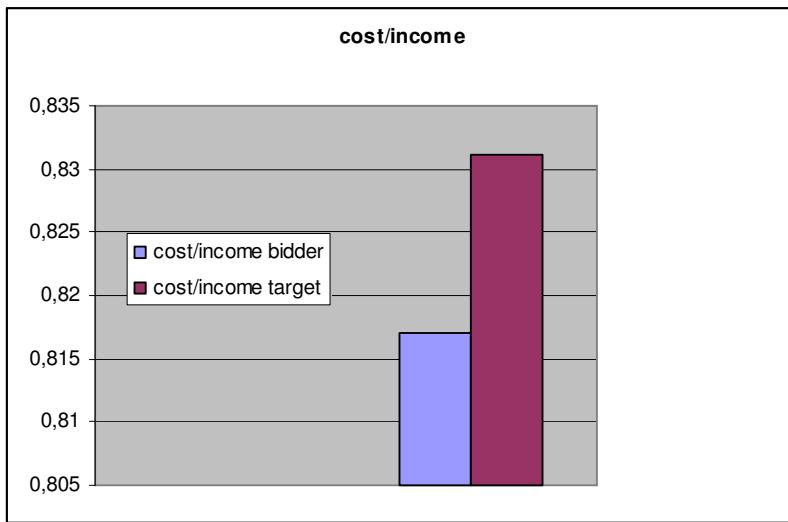
5.3.4 Total asset bidder/ total asset target

Confirming the previous literature this variable has an explanatory power for the value creation. In fact, if this indicator is high, the returns for the target are higher. This confirms the literature, showing that the acquisitions of small target create significantly higher excess returns for target shareholders. It seems that if the bidder acquires a smaller target, the operation is less risky and indeed the bidder is disposed to pay a higher price. But at the same time if the bidder acquires a smaller target, the synergy benefits are lower and that could explain why the combined value creation is higher when there is no a big difference in the asset size of target and bidder.

5.3.5 Cost/income (target/bidder)

As it is possible to see in the graph 5-5, bidding banks on average are more efficient than the average target. In fact bidding banks, seem on average to bid for less efficient targets that consequently provide for a sufficient efficiency potential. We measure the efficiency thanks to cost to income ratio of the target with respect to the bidder. Attachment C.1, C.2 and C.3 summarize the results, and show how when this indicator is high (the target is less efficient), the abnormal return for target, bidder and combined are statistically higher than when the indicator is low. We thus conclude that there is evidence that the capital market prefer bidders that are more cost efficient than their targets.





graph 5-5, cost/ income, source: elaboration of our database

5.3.6 ROA of the target

In order to asses the performance of the target, we have introduced this variable and the results show that it has a relevant impact on the value creation. In particular abnormal positive returns characterize deals in which the target shows a higher ROA. This result is not in contradiction with the previous one (cost income ratio). In particular if we compare this result with the cost\income ratio (target/bidder) we can conclude that there is a major value creation when the bidder is more efficient than the target, and at the same time the target is performing well (in term of ROA).

5.3.7 GDP and GDP real growth

Our results show how there is higher value creation in riche countries and where the GDP is growing smoothly. In fact the top 30 deals undertaken in countries characterized by a high gross domestic product show a CAR higher of 2 percentage point than the ones in poorer countries.

In addition a higher value creation characterizes the operations involving countries in which the GDP is growing smoothly, that is not in new emerging economy.

That means that operations taking place in developed country such as US or central west Europe are more likely to create value.



5.3.8 Credibility of the managers of the bidder

As we well already know, the opinion of the market nowadays is playing a key role in the company value. Our results, confirm the evidence that if the market has a positive opinion of the managers, then will react in a positive way, that is the company value will increase. In fact as is it possible to see from the Attachment C.1, C.2 and C.3 the abnormal returns will be higher when the managers of the bidder are more credible.

5.3.9 Portfolio distance and correlation of the return of the bidder\target

Here the results are different from the previous literature. In fact our results show that there is a major value creation when the bidder and the target are not correlated and the portfolio distance is higher.

A possible explanation is that when the target is operating in a different business than the bidder, the bidder is disposed to pay a higher price to enter in the new market.

If we then consider this outcome together with the previous variables, it seems to be that value is created when target and bidder are operating in similar countries, where the political, legal, economic and cultural distance is low, but when the target and bidder are not operating in the same business.

We want to remember, as we said at the beginning of this chapter, that this result cannot be generalised and the interrelation between different variables could hamper his validity. In the followings section, with the multivariate analysis, it will be possible to check better this outcome.



6 Main results

The main scope of this work is to identify the drivers of excess returns to the shareholders of the target, of the bidder and to the combined entity of the bidder and of the target. In session 3 we identified the variables which, theoretically, should influence the creation of value. In this chapter we use the statistical tools described in session 4 to answer the core question of our work.

In the first paragraph we check the impact of each variable by running a cross-sectional regression and in the second a factorial analysis is given.



6.1 Cross-sectional regression analysis

The comparative statistics run so far only allows testing for one driver of M&A success at the same time. It does not account for the effect of the other variables. Cross-sectional regression is a powerful tool that takes into account the combined effects of more variables at the same time.

6.1.1 General methodology

For each of the three objects (bidder, target and combined entity) and for each of the two event windows we run several regressions (exactly 8, which we explain in the following paragraphs). The dependent variable is always the *CAR* of the entity i in the event window t . The set of independent variables is different for each of the 8 case (j).

So the models to test are:

$$\underline{CAR}_i = \underline{\underline{X}}_{ji} \underline{\beta}_{ji} + \underline{\varepsilon}_{ji}$$

Where $0 \leq j \leq 8$, $i \in \{\text{target, bidder, combined}\}$, $t \in \{\text{EW1, EW2}\}$

In the first regression all the 47 variables are embodied. As we have a complete dataset only for 85 observations, we decided to run other regressions to broaden the sample.

In the following 5 regressions we test the relevancy of five different groups of variables. To this aim, we divide our set of explanatory variables into five groups, according to the nature of the variables.

- 1) Country variables
- 2) Distance variables
- 3) Variables describing technical features of the deal
- 4) Balance sheet variables
- 5) Stock market variables

So we run 5 regressions and in each one we include all the variables which belong to that group, so that we identify the most important ones.



In the seventh regression we select only the variables which turn out to be significant in the previous regressions.

The eighth regression is run following the stepwise method of selecting the variables (see 3.2.2.2).

In each regression we provide the following figures to check that the main hypotheses of the regression are met and to verify the goodness of the model as well (see chapter 4):

- estimated value of the coefficients (vector β)
- P-value (adding *** if $0 \leq P - value \leq 1\%$, ** if $1\% < P - value \leq 5\%$, * if $5\% < P - value \leq 10\%$)
- VIF (Variance Inflation Factor) to check the multicollinearity
- N (number of observations)
- R-sq (R-square) to check if the model fits data well
- R-sq (adj) to consider the fitting taking into account the number of variables
- F-test to check that variance is constant (homoschedasticity)
- DW (Durbin – Watson test) to check the absence of time based correlation
- AD (Anderson – Darling test) to check the normality of the residues
- Proportion correct (Discr. An.) is the output of the discriminatory analysis run with the set of variables
- Proportion correct (Discr. An.) with CV, the same as before, but with the Cross Validation

By running various regressions, we decrease the risk of misleading the interpretation of the results given to the high multicollinearity of the data, caused by the similarity of many variables. When two X variables are highly correlated, they both convey essentially the same information. In this case, neither may contribute significantly to the model after the other one is included. But together they contribute a lot. If you removed both variables from the model, the fit would be much worse. So the overall model fits the data well, but neither X variable makes a significant contribution when it is added to your model last. When this happens, the X variables are collinear and the results show multicollinearity.



The first measure we adopt to reduce multicollinearity is to consider the standardised country variables and not the original ones.

Secondly, in the regressions run in each group of variables, the number of observations is generally much higher (except for the balance sheet variables, in fact the labour cost variable is available only for few observations, however the correlation among the balance sheet variables is quite low), and this contributes to reduce the multicollinearity.

Thirdly, in the seventh regression we avoid selecting similar variables, even if turned out to be significant.

In the next paragraph, we will see that the best approach to solve this problem is running a regression with the factors generated from a factorial analysis, as the factors, by definition, are independent among each other.

We consider as key variables those variables which meet at least one of the following two conditions:

- Have a P-value lower than 10% (one, two or three stars) in at least two regressions
- Have at least in one regression a “three stars” p-value

The identification of the key variables and their impact, positive or negative, to the CAR is a first answer to our key question.

It is important to say that the first regressions run turned out to give a very high value of the DW test. This leaded us to introduce a new dummy variable.

$$x_{47}=0 \text{ if the deal is announced in 2000, 0 elsewhere.}$$

The introduction of this variable decreased significantly the degree of time based correlation among the residues and, moreover, turned out to be one of the key variables.



6.1.2 The key drivers of success for the target

Attachment D.1 shows the regressions for the target in the event window 1 (-10;10), whereas attachment D.2 illustrates the results in the long run, event window 2 (-10;30).

In both cases we notice that the fitting of the models are really good, the highest R-sq(adj) in the short run is 57,4%, achieved in the eighth regression; in the long run it is even better, as we reach 58%, again in the eighth regression. However it is better to exclude from our analysis the fifth regression, where the model does not fit the data at all.

The multicollinearity, as discussed before, is really evident in the first two regressions, but it decreases in the followings. Some heteroskedasticity can be observed, especially in the regressions 4 and 7, however the violation of the assumption of homoscedasticity does not invalidate the regression so much as weaken it. The normality of the residues is good in almost all the samples and there not seems to appear any time based correlation.

After these considerations, we can assume that our model is good and robust enough to study its output.

Even the output of the discriminatory analysis can be considered really good. In particular the models which provide the highest proportion of correct classified observations are in both windows the ones which include all the variables. In event window 1 this proportion is 94,1%, while in event window 2 it is 91,8%. To check either we can use those models for further observations, we should consider the results achieved with the cross validation. The seventh model guarantees the 74,2% in event window 1 and 73,1% in event window 2. This means that, thanks to our model, we can forecast with a confidence of 74% if a target is going to success or not in a future deal. Our software, MINITAB, does not provide us with all the tests for the stepwise regression.

Table 6-1 shows the main outcome from the target side (relevant variables, that is the ones having an impact on the value creation)



ID	Variable	Impact in the short run	Impact in the long run
38	Central bank transparency	+	+
19	Gross Domestic Saving - Real growth	+	+
21	GDP Real growth	-	-
45	Credibility of the manager (BIDDER)	+	
7	Cultural distance		-
10	Political distance	-	-
12	General legal system distance	+	+
13	Fiscal distance	+	
46	% of cash	+	+
47	Year (0=2000, 1=after 2000)	-	-
44	Relative performance with respect to the market of the target	-	-
5	Correlation of the returns bidder/tgt	-	-

Table 6-1 Key variables for the target

The first thing to note is that there is no difference in the short and in the long run. The key variables are except for the distance variables, the same and the impact on the CAR does not change.

As proved by the work by the European Commission (Commission 2005) the misuse of supervisory powers and the complexity of numerous supervisory approval processes may increase the level of uncertainty and risk of the transaction, therefore the transparency of the central bank is crucial to reduce the risks and boost the value.

Secondly the country of the target should show a fast growing tendency to save, that is an increasing dimension of the banking industry, but the economic growth should not be fast. We may come out with two reasons for that: first a great rate of growth of the GDP is typical of the countries not yet developed, so the market could be sceptical about them, secondly a fast growing economy could turn out to be risky as well, as it is not stabilised yet.



The credibility of the management of the bidder is important as well, because just a good and reliable administrator can bring innovations, efficiency and value.

The results for the distances are not easy to interpret. Cultural and political distances have a negative impact, whereas legal system and fiscal distances have a positive one. One of the possible interpretations is that cultural and political differences are synonymous of lack of information and uncertainty (De Long 2001bis), so they contribute to increase the risk of the deal, on the contrary fiscal and legal system differences can result as opportunities to benefit, for instance, from a more convenient legal or fiscal system.

As proved by various studies the shareholders prefer definitely cash payments. Moreover there is a significant difference among the deals announced in 2000, when the market was optimistic about M&A and after that year, when the worldwide stock markets experienced a great fall.

The balance sheet variables are not significant and the regression 5, which includes only those variables, does not fit the data at all, so we can conclude they do not impact on the value.

On the contrary it is crucial that the target had experienced a underperformance with respect to the market as, as showed by Hawawini (Hawawini 1990) the stock performance is a good proxy for the management quality of the target. Therefore the acquisition of a bad managed target can create a higher improvement potential and create more value.

To end up, the last key driver of success is the reduction of the market risk of the target, thanks to the merger with a bidder whose stocks are little correlated with the stocks of the target. This is in contradiction with some of the previous studies.

6.1.3 The key drivers of success for the bidder

Attachment D.3 shows the regression for the bidder in the event window 1 (-10;10), whereas attachment D.4 illustrates the results in the long run, event window 2 (-10;30).

In both cases we notice that the fittings of the models are lower than in the target, but higher than the ones achieved in the previous studies. This let us conclude that the returns of the



bidder are more difficult to forecast than the returns of the target. The highest R-sq(adj) in the short run is 37,2%, achieved in the first regression; in the long run in the stepwise regression we achieve a 21,2%.

The discussion about the multicollinearity made for the target is consistent with the models of the bidder as well. However we notice that there is no evident sign of heteroskedasticity or time based correlation. Moreover the residues fit the normal model even better than the ones of the target.

The output of the discriminatory analysis is even better than the one achieved for the target. In the short run the first model provide a 96,5% proportion of correct classifications, and 65,9% with cross validation. In the long run we get a 94,1% and a 63,5% respectively.

Table 6-2 shows the key variables for the bidder.

If we compare these results with the ones of the target, two considerations are evident. First, much more variables are needed and this is consistent with the fact the fact that the variance of the bidder is more difficult to explain. Second, in the long run we observe a decrease in the relevant variables. This could occur as the degree of uncertainty decreases as more information is provided to the market.

Let's start with some considerations about the degree of regulation. For variables 26 and 27 a high value indicates that there is a high level of deregulation and the system are not controlled by strict rules (see chapter 3 for a deeper explanation). The negative impact indicates that the high risks due to lack of regulation prevail over than the opportunity to enter a deregulated and free of constraints market.

Again the efficiency, the reliability and transparency of the legal and financial system of the country of the target is crucial. In fact some legal structures may prevent de iure or de facto, some institutions to be taken over or merge or even there may exist impediments to effective control. This can add additional risk and costs to the transaction (Commission 2005).



ID	Variable	Impact in the short run	Impact in the long run
26	Bank regulation (lack of)	-	-
36	Legal quality	+	
27	Regulation intensity (lack of)	-	-
39	Transparency of the government	+	
17	Credit flow	+	
18	Efficiency of the banking system	+	
15	Gross Dom. Saving Pro cap.	+	+
19	Gross Domestic Saving - Real growth	+	
20	Interest rate spread	-	
22	GDP (PPP)	+	+
23	GDP (PPP) Pro capita	+	+
32	Bribing and corruption (lack of)	+	
45	Credibility of the manager (BIDDER)	-	-
29	Density of population		-
9	Economic distance	+	
13	Fiscal distance	-	
46	% of cash		-
35	Attitude (1=friendly, 0= no friendly)	+	
47	Year (0=2000, 1=after 2000)	+	
41	ROA tgt	+	+
24	Cost/income (tgt/bidder)	+	
2	total asset growth tgt	+	
25	labour cost ratio	+	+
31	Correlation of the returns of the target with the market	-	

Table 6-2 Key variables for the bidder

The dimension and the tendency to growth of the financial sector of the country of the target play as well an important role. Moreover there is more value creation potential in rich countries, with high GDP and GDP pro capita.

A high IRS is typical of poor countries. The negative impact is consistent with what sustained before.

Difficult to interpret is the negative impact of the credibility of the merger and of the density of population. For the latter, we could argue that most successful deals are run in the States, which are characterised by a low level of density of population.

The fiscal differences turned out to have a positive impact for the target and bad for the bidder. So we may argue that the target can benefit more easily from fiscal advantages.

The negative impact of the payment in cash is consistent with the theory of Myers and Majluf (Myers and Majluf 1984) who argued that bidders prefer cash payments if they believe that their stock are undervalued and vice versa.

Of course, a friendly deal is less costly for the bidder. Consistently with what observed for the target, the overoptimistic attitude during the year 2000 made the prices of M&A fly up, which caused abnormal positive returns for the targets and more costs for the bidders.

The balance sheet key variables reveal that the bidder shows abnormal positive returns when targeting a profitable but less efficient company. This is consistent with, for instance, the work by Resti (Resti 2004) who argued that the higher the ROA of the target, the more value it creates, or Piloff (Piloff 1996), who proved that the improvement of the cost efficiency after the transaction is positively correlated to the value creation. Improvements are greatest for the banks with the lowest efficiencies prior to merging, which therefore had the greatest capacity for improvement.

The positive impact of the target asset growth proved what showed by, for instance, Beitel (Beitel 2003) : bidders and combined entity get better returns when acquiring fast growing targets. The risks of acquiring a growing target (not yet stabilised) are therefore not so



relevant (Cornell (2000) argued that growth oriented transactions destroy value for the bidder).

To conclude, we observe again that the market risk reduction, led by acquiring a target not correlated to the market index, drives a positive impact to the bidder.

6.1.4 The key drivers of success for the combined entity

We saw that, on average, the combined entity does not experience abnormal returns. This means that the value of the merged entity equals the sum of the values of the two companies before the merger, that is, only a transfer and not a creation of value takes place.

Nevertheless that is just a high level consideration; it is important and interesting to delve into that issue and find out which types of deal are successful for the combined entity.

Attachment D.5 shows the regression for the combined entity in the event window 1 (-10;10), whereas attachment D.6 illustrates the results in the long run, event window 2 (-10;30).

In both event windows we notice that the fittings of the models are similar to the ones of the bidder, and higher than the ones achieved in the previous studies. The highest R-sq(adj) in the short run is 33,1%, achieved in the stepwise regression; in the long run in the stepwise regression we achieve exactly the same value 33,1%.

The values of the tests are very similar to the ones of the bidder as well. There is no evident sign of heteroskedasticity or time based correlation. Moreover the residues fit the normal model even better than the ones of the target.

The output of the discriminatory analysis is pretty good. In the short run the first model provide a 81,2% proportion of correct classifications, and the eighth model a 47,7% with cross validation. In the long run we get from the first model a 78,9% and a 60,2% respectively. We conclude that it is more reasonable to make forecasts in the long run.

Table 6-3 shows the key variables for the target.



ID	Variable	Impact in the short run	Impact in the long run
15	Gross Dom. Saving Pro cap.		+
19	Gross Domestic Saving - Real growth		+
20	Interest rate spread		-
36	Legal quality	+	
23	GDP (PPP) Pro capita	-	-
22	GDP (PPP)		+
21	GDP Real growth	-	-
41	ROA tgt	+	+
24	Cost/income (tgt/bidder)	+	+
42	ROA growth TGT		-
2	total asset growth tgt	-	
43	P/B value TGT (announcement day)	-	
3	Portfolio distance	-	-
5	Correlation of the returns bidder/tgt	-	-

Table 6-3 Key variables for the combined entity

First, it is evident that the key variables in the short run are quite different from the ones in the long run. Second, the key variables are few and mostly country variables, so, from the combined point of view, the macroeconomic impact of the merger is crucial.

It is clear that successful deals occur when targeting a country with a wide economy (high GDP) and a wide and fast growing financial system, with a good and reliable legal system, but not with a rich economy, nor fast growing, as this can create risks due to economical instability.

The target should be profitable, but less efficient than the bidder. A fast rate of growth of the total asset or the profitability can bring risk and instability, whereas the undervaluation by the stock market can boost the potential for improvements.

Finally, in a successful deal the companies strive to reduce the stock market risk, not by diversifying towards different businesses, but targeting companies whose stocks are little correlated with the ones of the bidder.



6.1.5 General overview of the key variables

In this paragraph we want to provide an even more synthetic model of the keys variables for each one of the entities involved in the deal. Therefore for each entity we select only the variables which turned one to be relevant both in the short and in the long run.

Table 6-4 is a synthetic comparison among the key variables for target, bidder and combined entity.

		Target	Bidder	Combined
38	Central bank transparency	+		
19	Gross Domestic Saving - Real growth	+		
21	GDP Real growth	-		
26	Bank regulation (lack of)		-	
27	Regulation intensity (lack of)		-	
15	Gross Dom. Saving Pro cap.		+	
22	GDP (PPP)		+	
23	GDP (PPP) Pro capita		+	+
45	Credibility of the manager (BIDDER)		-	
10	Political distance	-		
12	General legal system distance	+		
46	% of cash	+		
47	Year (0=2000, 1=after 2000)	-		
41	ROA tgt		+	+
25	labour cost ratio		+	
24	Cost/income (tgt/bidder)			+
3	Portfolio distance			-
44	Relative performance with respect to the market of the target	-		
5	Correlation of the returns bidder/tgt	-		-

Table 6-4 Comparing the key variables for target, bidder and combined entity

One can observe that the key drivers of success of target and bidder are different, and there isn't any conflict of interests between them. Therefore managers could develop a strategy to boost the values of both firms, following these results.



6.2 Factorial analysis and regression with the factors

We said in the previous chapter that one of the main problems affecting the quality of the results of the regression run before was the multicollinearity. We observed as well that the main cause of this was the high correlation among certain variables.

This is the first reason for undertaking a factorial analysis. As explained in chapter 4, the factors are independent among each other, therefore the problem is solved, in fact the VIF is always 1.

Secondly, we ended up with 47 variables, some of them explaining the same concepts; therefore it could be interesting to reduce the number of variables and check if the factors make sense.

Third, by running a multiple regression with the factors which will be found to be meaningful, we can check, confirm or contradict, the results achieved with the original variables. Of course, if the results will not change dramatically, this would allow us to conclude that our results are robust.

6.2.1 The loading matrix and interpretation of the factors

Attachment E.1 shows the loading matrix with 24 factors, which explains the 93% of the variance of the variables and all the original variables are correlated to at least one factor, so that we are not going to lose information.

The second step is to try to interpret the factors. We observe that factor 1 is highly correlated with all those variables which express characteristics of the country of the target. Therefore we can interpret factor 1 as the “quality of the country of the target”. Factor 2 shows high positive correlations with the distances and the dummy variable “cross-border”, so we can interpret it as the degree of geographic diversification.

Going on with this method we can interpret each factor (see attachment E.2). When the correlation is negative, we should take it into account when naming the factor.



For instance factor 5 is negatively correlated to the variable GDS pro capita. So, not to affect the coherency of the interpretation we name it “Tendency to consume of the country of the target”.

We notice that the interpretation is clear and it make good sense, which is a further indicator of the goodness of the data.

6.2.2 Multiple regression with the factors

Attachment F.1 and F.2 show the results of the multiple regression with the factors.

The models fit the data well, especially in the long run where we achieve a considerable degree of fitting of the models. There is no multicollinearity as all VIF equal 1 and, as noted for the previous models, there is some clue of heteroskedasticity for the target.

The Durlin-Watson tests indicate that no evident sign of time based correlation is present, and the normality of the residues can be accepted.

The robustness of the model is confirmed by the fact that the results for the stepwise regression are almost the same as the ones of the regressions with all the factors.

The output of the discriminatory analysis is similar to the one of the previous models: in the long run we reach a very high percentage of correct classifications, especially for the target, 72,4%, but also for the bidder and for the combined entity, 65,8% and 64,5%.

Let's start by analysing the target. The relevant factors are, almost completely, the same identified in the previous analysis. We confirm the importance of the quality of the country, (in particular the central bank transparency, as observed before), of the relative performance of the target, of the market risk reduction, the stability of the GDP growth and that the payment is done in cash.



The geographic diversification has a negative impact but, at least in the short run, it is not significant in the second regression. In the previous regressions, where the cultural and political distances had a negative impact, but the legal system and fiscal distance were drivers of success.

We observed that a new characteristic looks important: the relative dimension. The target gains more value when smaller than the bidder. This is coherent with Beitel (2003), for instance, who argued that the acquisition of small targets creates higher excess returns for the target.

Let's move to the bidder. In this case the main results are confirmed. We observe, however, two contradictions and a new factor.

The new factor is the growth of the profitability of the target, which should be stable, in order to decrease risks. The contradictions are the GDS real growth, that before was supposed to have a positive impact, now it shows a negative one, and the total asset growth. In fact the current model shows that bidders benefit from stable and gradual growth. So we can not conclude anything about those issues.

By analysing the results for the combined entity we observe a clear coherence.

To sum up, we can say that the factor analysis confirm, almost completely, the results of the previous analyses. This allows us to use the results to answer the key questions of our work. In the last chapter we resume the main conclusions.



7 Conclusions

The results of our work demonstrate that the success of a merger can be partly forecast. The study may be a very helpful guide to bank managers that will perform mergers to achieve further growth, as well as to shareholders that need to approve the deals and judge whether they will increase their value.

On average targets increase their value significantly, while bidders undermine value. From a combined point of view, no value is created. Nevertheless the variance of the abnormal returns is high, so the success for both companies strongly depends on some key drivers.

The main drivers of success for the target are the qualities of its country, (in particular the central bank transparency), an underperformance of its stock with respect to the market during the year before the announcement, a high potential for market risk reduction, the stability of the GDP growth of its country, a relative small dimension with respect to the bidder and that the payment is made in cash.

The efficiency, the reliability and transparency of the legal and financial system, the dimensions and the growth tendency in the financial sector of the country of the target are crucial for the success of the bidder. Moreover there is more value creation potential in rich countries, with high GDP and GDP pro capita. The deal should be friendly and the payment not made in cash. Bidders should target profitable but less efficient targets, with a high potential for market risk reduction.

From a combined point of view successful deals occur when targeting a country with a wide economy (high GDP) and a wide and fast growing financial system, with a good and reliable legal system, but not with a rich economy, nor fast growing, as this can create risks due to economical instability. The target should be profitable, but less efficient than the bidder. A fast rate of growth of the total asset or the profitability can mean added risk and instability, whereas the undervaluation by the stock market can boost the potential for improvements. Finally, in a successful deal the companies strive to reduce the stock market risk, not by diversifying towards different businesses, but targeting companies whose stocks are uncorrelated with the ones of the bidder.



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