MERGERS, LIQUIDATIONS AND BANKRUPTCIES IN THE EUROPEAN BANKING SECTOR

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Abstract

The inactivity of banks may be the result of a number of events, such as merger & acquisition (M&A), liquidation, default-bankruptcy, etc. All these phenomena of inactivity contribute to the same result, the reform of the European banking sector and they may have the same causes.
The paper will address the issue of inactivity and will try to detect its causes using econometric models. Six groups of indicators are examined: performance, size, ownership, corporate governance, capital adequacy or capital structure and loan growth. Three econometric methods (Probit, Logit, OLS) have been used to create a system that predicts inactivity.
The results of the econometric models show that from the six groups of indicators, four have been found to be statistically important (performance, size, ownership, corporate governance). Two have a negative impact (ownership, corporate governance) on the probability of inactivity and two positive (performance, size). The paper's value and innovation is that it has given a systemic approach to find indicators of inactivity and it has excluded two groups of indicators as non-statistically important (capital adequacy or capital structure and growth).

Keywords: Mergers, Liquidations, Bankruptcy, Banks, Europe

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1. Introduction

The European banking sector has gone to a transformation during the last two (2) decades. The origin of the transformation is common (deregulation and legal isomorphism, product inflation and complexity, stock market development) to both sides of the Atlantic, but in Europe it has some unique characteristics. Europe is diverse and the banking system across Europe hasn't the same characteristics (ownership, legal framework, etc.) and path of development (in some countries there are a large number of banks while in other only a few).

The inactivity can take many forms or has many causes (merger & acquisition (MA), liquidation, default-bankruptcy , etc.). All these phenomena of inactivity contribute to the same result, the reform of the European banking sector and they may have the same causes. Having in mind the diversity of the European banking system, many scholars have argued that there is convergence trend in Europe (Casu and Girardone, C., 2010; Murinde, Agung and Mullineux,, 2004; Schmidt, Hackethal and Tyrell, M., 2001) and other countries (Brau, Dahl, Zhang, and Zhou, M., 2014). The basic argument is the convergence on the legal – regulatory system of Europe. Others (Rughoo and Sarantis, 2014; Gibson and Tsakalotos, 2013; EUROPEAN CENTRAL BANK, 2012; Busch, 2002) challenge this hypothesis.

The complexity and diversity of the European banking system (each country's banking system has its unique characteristics) is still a fact that all scholars should take into account. Legal and regulatory convergence doesn't seem to have the necessary power to drive the European banking system to an isomorphic state.

The paper addresses the issue of inactivity while taken into account the different causes of inactivity and the differences of the corporate governance, legal and economic system of the counties that are studied. A number of regressions will be presented to show these differences and the formulating factors in each significant case.

2. The Banking System of Europe before and after the crises of 2008

The banking system of Europe has gone through two decades of turbulence. Through the 1990's a wave of mergers, liquidations and bankruptcies has swept the sector. This wave was at its peak the last years of the 1990's and the 2000-2004 period. Since then the number of exits form the sector has been relatively stable (see Figure 1). It is notable that the cooperative banks suffered more than the commercials. This fact can be attributed to their smaller size, ownership structure, management efficiency, etc. The crises of 2002 don't seem to have any effect on the trend and the number of inactive banks per year is lowering until 2006. Small increase is observed during the crisis of 2008, but the number is stabilized the years that follow 2009. The explanation for these results on inactivity can be explained if the causes of inactivity are studied.

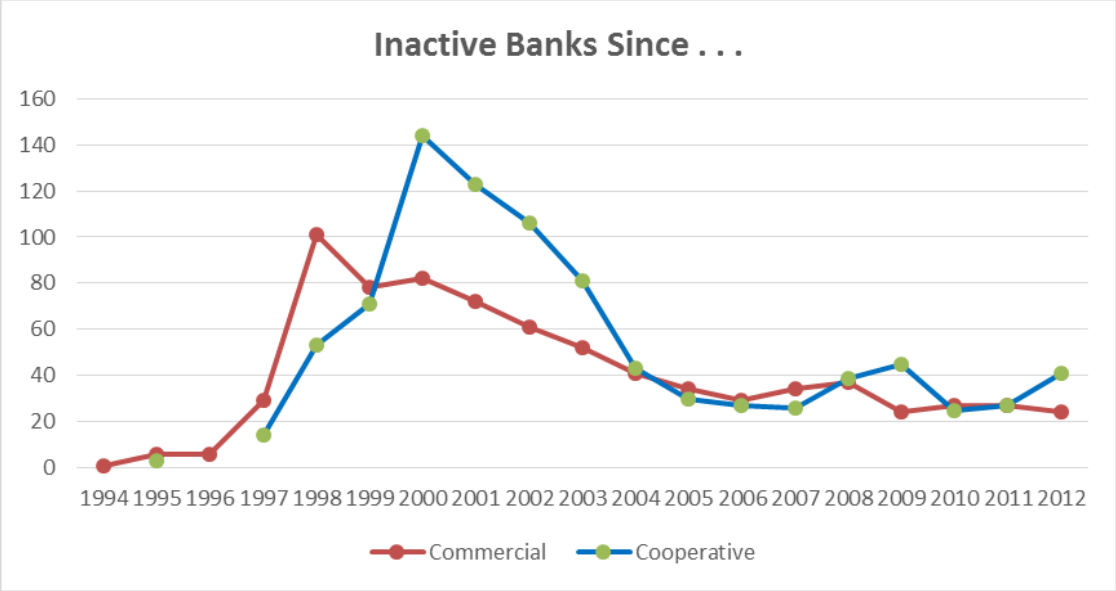

Figure 1. Inactive Banks
Source: Bankscope

The analysis of the exits form the sector (see Figure 2) shows that the majority of the exits are caused by mergers (80.57%, see Table 1). The vast majority of M&As have occurred during the pre-Euro period (1998-2001). European banks seem to be seeking a new strategic advantage (size and alliances – geographical expansion).

Bankruptcies take place in three distinctive periods (1999-2002, 2008-2009 and 2011-2012). These periods are the same with the ones that scandals or crises took place, and they must be direct or indirect result of these failures (in regulation, ethics, corporate governance, risk management, financial management, etc.).

Table 1. Causes of inactivity in the European Banking Sector

	Dissolved, In Liquidatiuon	Merger	Bankruptcy	Total
Number	308	1339	15	1662
%	18,53%	80,57%	0,90%	100,00%

Source: Bankscope

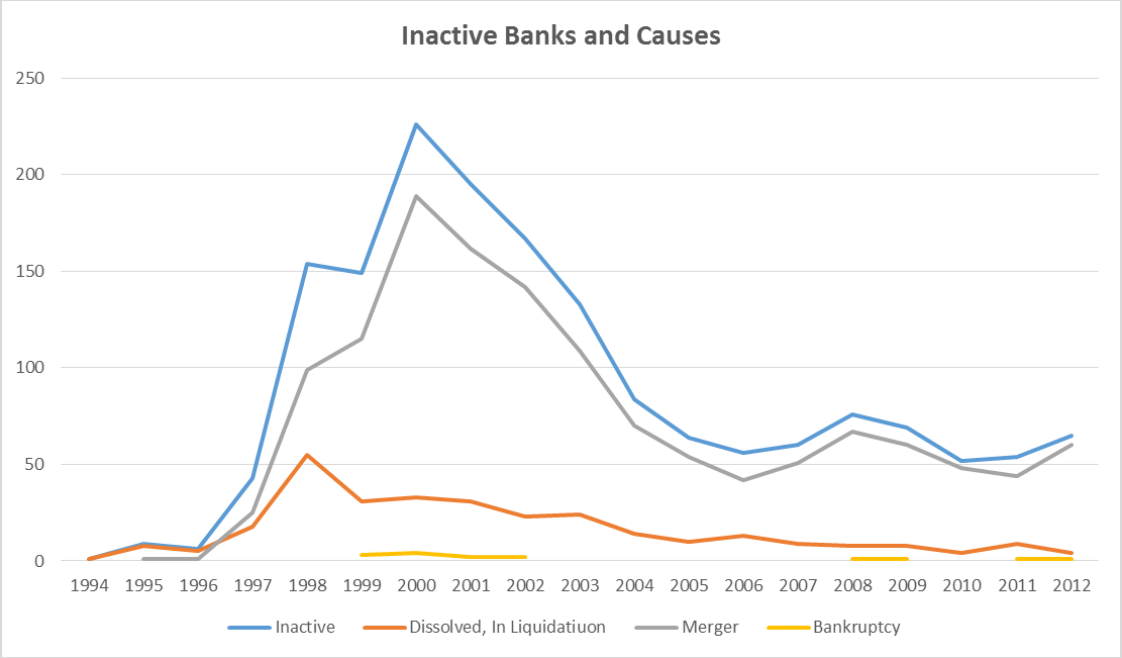

Figure 2. Status of Inactive Banks
Source: Bankscope

The analysis of the ownership and banks' entity show that the banks that were recorded as inactive during the last two decades were mostly banks that their activity was focused in a single country (see Figure 3). This trend is observed from 1994 to 2004. From that point on inactivity appears to have other targets (since the main cause is M&As) or is caused by the consolidation of subsidiaries. The driver of inactivity of M&As during the whole period of analysis. Especially, for the period after the 2002 crisis, M&As seem to be the main driver (although at a lower level number of inactivity).

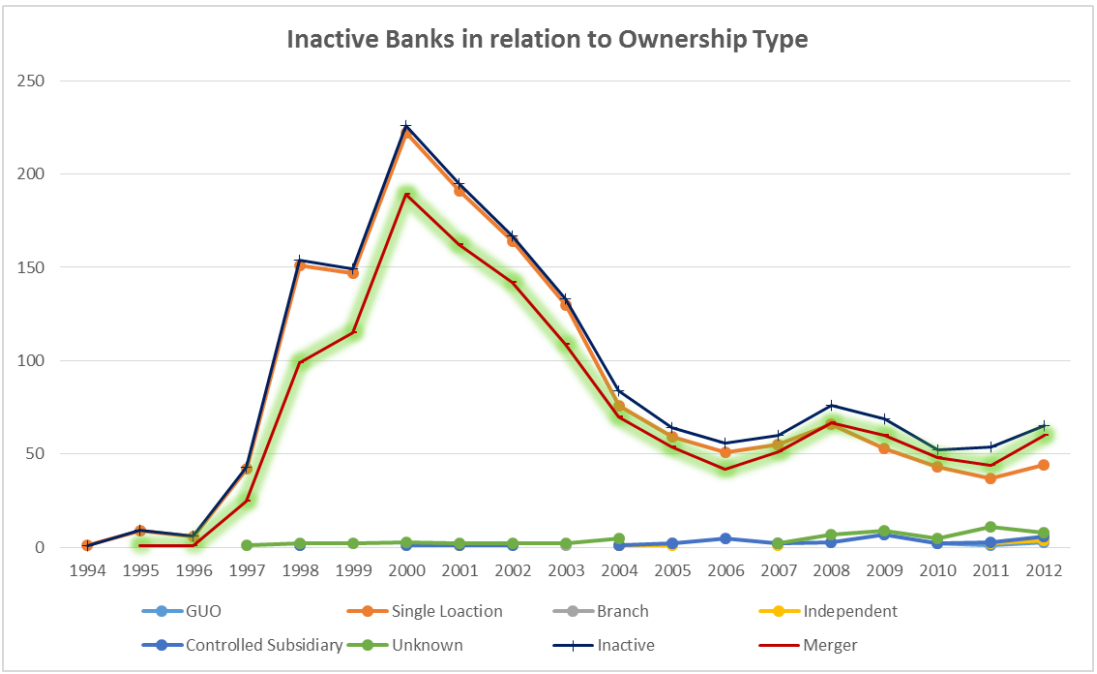

Figure 3. Inactive Banks – Ownership (Entity) Type
Source: Bankscope

GUO - Global Ultimate Owner (ownership of at least 50.01%)

The merger wave of 1998-2004 may have two separate causes. The first one (before 2001) is the consolidation of capital – assets and the acquisition of market share or achievement of competitive advantage, due to the greatest bull market ever and the continuous development of the financial sector. The second (after 2001) one can be attributed to the uncertainty of the market after the crises of 2001-2002.

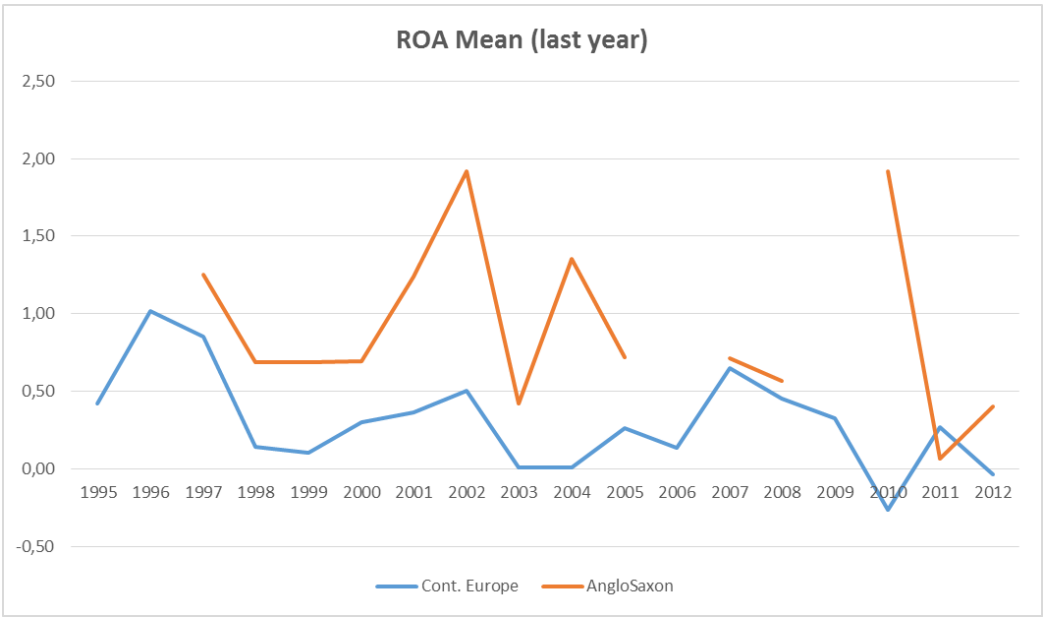

Figure 4. Inactive Banks (Mergers) – ROA
Source: Bankscope

The causes can be analyzed using performance and size indicators like Return On Assets (ROA) and Equity to Total Assets (ETA) ratios. High ROA M&As are an indication of the incentive that drove to inactivity. High ROA is attractive for hostile takeovers. "Acquiring banks are larger and have a higher ratio of loans to financial assets, suggesting that their strong point is lending" (Focarelli, Panetta and Salleo, 2002). The incentive is to balance the loan growth with higher performance. Figure 4 shows that inactivity in Anglosaxon countries is higher than the one observed in Continental Europe countries. The difference can be explained by the difference of MA incentive. It is hypothesized that in Continental Europe countries the incentive is the drive to cumulate the size (see Figure 5) of the bank in order to acquire a competitive advantage or a better chance to survive.

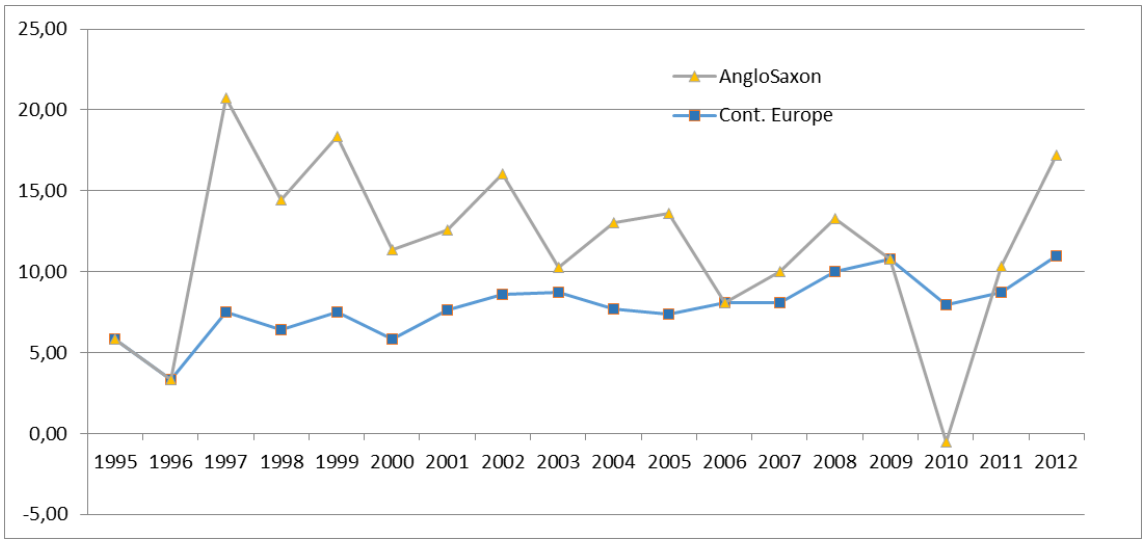

Figure 5. Inactive Banks (Mergers) – Equity to total Assets
Source: Bankscope

Independent rating agencies evaluate and rank the banks. Their evaluation and ranking procedure has a specific result. Rankings can have a significant impact on the perception of financial, competitiveness and management stability. The paper uses Fitch's ranks test this hypothesis.

To elaborate on the climate and expectations of the market during this period a numerical ranking of the ranking scale of Fitch has been drafted (see Table 2) in order to compare the rankings and to create an overall index of the market's expectation of the banks that were merged. As shown in Figure 6 the average of the Long Term Rating is above 16 (the average for the dissolved banks is 17,31, i.e. A- and for the merged banks is 18,85, i.e. A). In both cases the ranking is high and hence the merging banks had a relatively good bargaining position.

Table 2. Fitch Rating Scale

Fitch Ranking	Description	Numerical Rank
AAA	Investment grade rating, Highest credit quality	24
AA+	Investment grade rating, Very high credit quality	23
AA	Investment grade rating, Very high credit quality	22
AA-	Investment grade rating, Very high credit quality	21
A+	Investment grade rating, High credit quality	20
A	Investment grade rating, High credit quality	19
A-	Investment grade rating, High credit quality	18
BBB+	Investment grade rating, Good credit quality	17
BBB	Investment grade rating, Good credit quality	16
BBB-	Investment grade rating, Good credit quality	15
BB+	Speculative grade rating, Speculative	14
BB	Speculative grade rating, Speculative	13
BB-	Speculative grade rating, Speculative	12
B+	Speculative grade rating, Highly speculative	11
B	Speculative grade rating, Highly speculative	10
B-	Speculative grade rating, Highly speculative	9
CCC+	Speculative grade rating, Substantial credit risk	8
CCC	Speculative grade rating, Substantial credit risk	7
CCC-	Speculative grade rating, Substantial credit risk	6
CC	Speculative grade rating, Very high levels of credit risk	5
C	Speculative grade rating, Exceptionally high levels of credit risk	4
DDD	Default	3
DD	Default	2
D	Default	1
WD	Rating withdrawn	-1
NR	Not rated	0

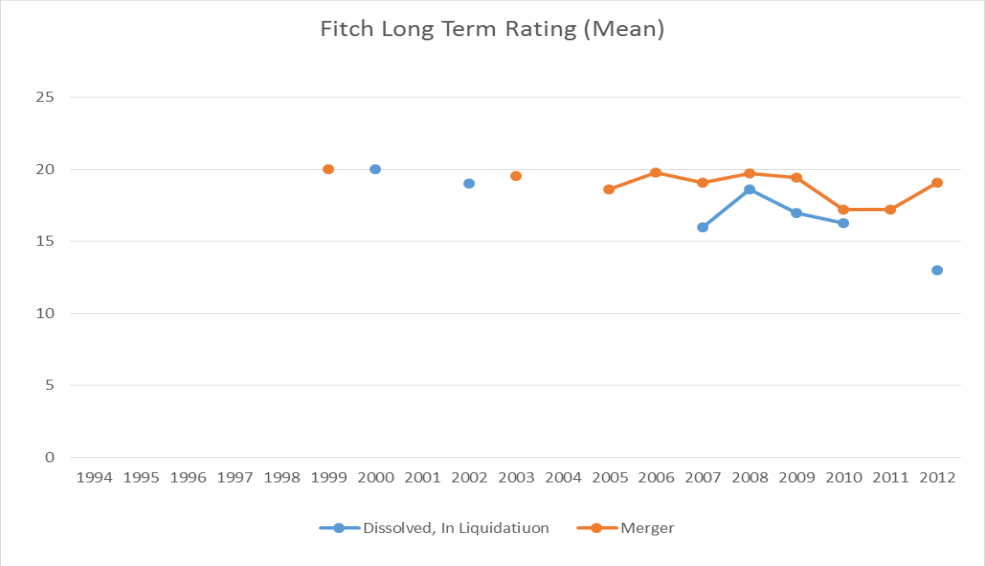

Figure 6. Fitch Long Term Rating
Source: Bankscope

The merger – liquidation wave of 1998-2004 has create a more concentrated market (from 4.500 banks in Europe in 1994, in 2012 have been reduced to 2.873). A third of the banks (36,73%, see Table 3) didn't manage to adapt to the new environment or their strategy to the challenges of the market was to seek safety in size and in cooperation with other banks. This hypothesis is supported by the fact that the vast majority of the banks that were merged or dissolved, were single location banks (meaning that the smaller banks in equity and capital were the targets for mergers) (see Table 4).

The wave didn't affect at the same extend all countries. Germany, Italy France, Spain, Luxemburg and UK had the largest reduction in the number of active banks (see Table 3). Especially, in Germany and Italy the percentage of financial market restructuring is very high (16.25% and 6.07% respectively).

Although the data used per se do not reveal the nature of these mergers, Martynova and Renneboog (2006) reveal that a small portion of merger activity involves transatlantic parties (bidders or targets). Even the majority of Intra-European activity is not cross border. On the contrary the majority of the merger activity in Europe (about 80%) is observed within national borders. "Fragmented and mostly domestically-oriented European companies resorted to takeover deals as a tool to survive the tougher regional competition created by the new market" (Martynova and Renneboog, 2006). The finding of the two researchers strengthens the argument that the merger activity in Europe aimed at achieving competitive advantage, to create economies of scale and to obtain larger market share.

Table 3. Dissolves – Mergers by Country

Country	No of Dissolves - Mergers	% of Dissolves - Mergers	Reduce of No of Banks in each country
Austria	26	1,6%	0,57%
Belgium	42	2,5%	0,93%
Bulgaria	6	0,4%	0,13%
Cyprus	5	0,3%	0,11%
Czech Republic	16	1,0%	0,35%
Denmark	25	1,5%	0,55%
Estonia	6	0,4%	0,13%
Finland	5	0,3%	0,11%
France	171	10,3%	3,78%
Germany	736	44,3%	16,25%
Greece	13	0,8%	0,29%
Hungary	12	0,7%	0,27%
Ireland	14	0,8%	0,31%
Italy	275	16,5%	6,07%
Latvia	9	0,5%	0,20%
Lithuania	4	0,2%	0,09%
Luxembourg	71	4,3%	1,57%
Malta	2	0,1%	0,04%
Netherlands	26	1,6%	0,57%
Poland	23	1,4%	0,51%
Portugal	14	0,8%	0,31%
Romania	8	0,5%	0,18%
Slovakia	11	0,7%	0,24%
Slovenia	11	0,7%	0,24%
Spain	65	3,9%	1,44%
Sweden	7	0,4%	0,15%
Uk	60	3,6%	1,33%
Total	1.663	100,0%	36,73%

Source: Bankscope

Table 4. Entity –Ownership Status of Inactive Banks

Year	GUO*	Single Location	Branch	Independent	Controlled Subsidiary	Unknown
1994		1				
1995		9				
1996		6				
1997		42				1
1998		151			1	2
1999		147				2
2000		222			1	3
2001		191		1	1	2
2002		164			1	2
2003		130	1			2
2004	1	76		1	1	5
2005		59	2	1	2	
2006		51			5	
2007		55		1	2	2
2008		66			3	7
2009		53			7	9
2010	2	43			2	5
2011	1	37		2	3	11
2012	3	44		4	6	8
Total	7	1547	3	10	35	61

Source: Bankscope

** GUO - Global Ultimate Owner (ownership of at least 50.01%)*

Table 5. Inactive Banks (Ratios)

Country	Dissolved, In Liquidation			Merger			Bankruptcy			Average of TCR	Average of ENL	Average of GGL
	TCR*	ENL*	GGL*	TCR	ENL	GGL	TCR	ENL	GGL			
Austria	9,43	56,24	89,76	13,47	26,66	22,09				12,46	38,49	53,11
Belgium	15,02	61,59	-21,00	11,25	61,03	-0,39				13,13	61,23	-8,53
Bulgaria		286,29	-36,79	13,76	24,03	106,46		85,91	-23,27	13,76	78,05	60,96
Cyprus		176,15	105,57		-18,06	-9,71					137,31	82,51
Czech Republic	10,60	107,16	-27,19	16,67	14,15	21,86				13,64	60,66	-5,73
Denmark	11,50	9,61	27,76	18,34	38,95	9,47	13,80	5,93	-8,48	16,63	30,29	10,25
Estonia	27,29	43,52	54,03	12,91	15,08	119,16	18,40	18,94	47,49	19,76	29,94	74,65
Finland	11,40	11,75	-4,04	13,03	12,83	22,48				12,70	12,62	17,18
France	10,95	69,99	-10,41	16,11	22,92	7,70				14,32	40,22	1,19
Germany	13,97	58,79	-2,37	16,11	12,73	2,69		9,20	7,04	16,05	16,05	2,31
Greece	7,48	3,53	-1,08	9,65	24,81	35,45				8,93	23,17	32,64
Hungary		35,43	35,04	14,88	53,96	37,06				14,88	48,26	36,44
Ireland		29,48	17,03	11,90	29,63	18,63				11,90	29,53	17,52
Italy	18,32	25,58	7,11	17,76	30,51	16,22				17,80	30,13	15,46
Latvia	47,02	241,75	10,41	32,05	54,81	7,31	18,13	171,43	380,00	38,61	162,86	50,44
Lithuania	16,80	8,24	38,04	16,38	25,61	174,58				16,52	16,92	106,31
Luxembourg	60,97	108,76	-8,23	55,19	101,58	-12,19				57,11	104,21	-10,74
Malta				23,40	283,15	55,78				23,40	283,15	55,78
Netherlands	22,55	116,47	-11,42	19,56	17,96	28,02	22,60	139,27	16,58	20,42	55,85	13,36
Poland		65,91	9,02	10,57	21,65	42,86		96,67	-34,48	10,57	29,08	36,26
Portugal		189,41	-77,47	11,00	11,99	10,85				11,00	24,66	4,54
Romania	51,40	52,72	291,42		-13,05	23,31	23,04	53,13	68,68	32,49	19,94	101,68
Slovakia		16,37	131,18	11,89	22,00	24,05	10,20	20,30	51,80	11,33	20,51	43,09
Slovenia		14,66	-39,85	22,85	32,89	6,59				22,85	31,06	-1,85
Spain		119,97	43,25	10,80	26,04	4,29				10,80	39,90	10,98
Sweden				25,37	84,14	-13,92				25,37	84,14	-13,92
UK	49,75	104,92	-8,28	10,10	30,55	13,29				41,82	76,32	-0,71
Total	23,22	75,93	4,42	17,69	23,61	8,14	17,42	47,70	44,51	18,36	32,86	7,79

Source: Bankscope

** TCR = Total Capital Ratio, ENL = Equity / Net loans, GGL = Growth of Gross Loans*

Financially (see Table 5), the dissolved or merged banks presented a wide spectrum of values on the selected three ratios (Total Capital Ratio, Equity to Net Loans and Growth of Gross Loans). No pattern seems to present itself (eg. Low TCR values). A hypothesis is that there are market formulating factors that differ from country to country (eg. Growth of gross loans is quite different from country to country).

The map of the financial sector in Europe after fifteen years of turbulence (positive or negative) has changed dramatically, but the factor of spatial dispersion of the sector remains the same. Germany has the largest number of banks (almost the 40% of the total number), followed by Italy (18.62%), France (7.45%), Austria (6.68), UK (4.8%) and Spain (4.18). The largest economies of the EU have the largest number of banks. In terms of total equity (TE) and interest income on loans (IIL) the European market has different variance. Using these ratios as classification factors, France (26%) has the largest banking sector in Europe, followed by Germany (14.25%). The concentration of equity capital and income from loans is different from the concentration of banks (as institutions). That means that there is a difference in size and hence a difference in importance.

Table 6. Active Banks, Ratios and Specialization

Country	Specialization		Total	Commercial %	Cooperative %	Total Number %	TE %	IIL %
	Commercial	Cooperative						
Austria	75	117	192	6,69%	6,68%	6,68%	2,91%	2,53%
Belgium	31	8	39	2,77%	0,46%	1,36%	4,43%	4,06%
Bulgaria	19	2	21	1,69%	0,11%	0,73%	0,26%	0,27%
Cyprus	19	2	21	1,69%	0,11%	0,73%	0,40%	0,85%
Czech Republic	19	2	21	1,69%	0,11%	0,73%	2,78%	2,45%
Denmark	42	10	52	3,75%	0,57%	1,81%	3,16%	3,97%
Estonia	7		7	0,62%	0,00%	0,24%	0,22%	0,05%
Finland	10	2	12	0,89%	0,11%	0,42%	2,19%	1,18%
France	127	87	214	11,33%	4,97%	7,45%	26,25%	25,76%
Germany	130	998	1128	11,60%	56,96%	39,26%	11,17%	14,25%
Greece	12	1	13	1,07%	0,06%	0,45%	0,33%	0,74%
Hungary	30	1	31	2,68%	0,06%	1,08%	0,78%	0,89%
Ireland	12	1	13	1,07%	0,06%	0,45%	1,72%	1,40%
Italy	92	443	535	8,21%	25,29%	18,62%	9,16%	9,19%
Latvia	22		22	1,96%	0,00%	0,77%	2,05%	1,37%
Lithuania	12		12	1,07%	0,00%	0,42%	0,54%	0,72%
Luxembourg	72	2	74	6,42%	0,11%	2,58%	2,51%	1,88%
Malta	9	1	10	0,80%	0,06%	0,35%	0,20%	0,05%
Netherlands	34	1	35	3,03%	0,06%	1,22%	6,30%	7,18%
Poland	49	2	51	4,37%	0,11%	1,78%	2,46%	2,76%
Portugal	26	2	28	2,32%	0,11%	0,97%	1,27%	1,54%
Romania	25	2	27	2,23%	0,11%	0,94%	1,05%	0,76%
Slovakia	13		13	1,16%	0,00%	0,45%	0,37%	0,31%
Slovenia	18	2	20	1,61%	0,11%	0,70%	0,24%	0,26%
Spain	55	65	120	4,91%	3,71%	4,18%	5,22%	5,32%
Sweden	23	1	24	2,05%	0,06%	0,84%	1,33%	1,30%
UK	138		138	12,31%	0,00%	4,80%	10,70%	8,97%
Total	1121	1752	2873	100,00	100,00	100,00	100,00	100,00

Source: Bankscope

As expected, ownership is more dispersed in the Anglo-Saxon corporate governance system. Only 5,33% of the banks have ownership concentration higher than 50,01%, whereas in the Continental Europe system ownership concentration above the threshold of 50.01% is 18.97% (see Table 7). This finding is in accordance with the one that Franks et el. (2008) reported (UK ownership concentration is 18%, Germany 43% and Italy 68%). On the other hand the difference of ownership concentration between North and South is also substantial. Countries that were ranked to the Anglo-Saxon corporate governance system seem to have the majority of their banks to be controlled subsidiaries (77.51%). PIGSs' banks are very close to the average of every type of ownership[52].

[52] Bankscope does not provide historical data for ownership. The only data given is for the last year of entry and can only be used to classify the sample and to make panels

Table 7. Active Banks, Ownership status as per spatial dimensions

Entity type	Cont. Europe	Anglo-Saxon	North	South	No PIGS	PIGS	Total
GUO	18,97%	5,33%	20,13%	12,38%	18,01%	20,69%	18,17%
Single Location	21,86%	13,61%	27,03%	4,68%	22,45%	4,60%	21,37%
Branch	1,63%	1,78%	1,68%	1,51%	1,33%	6,32%	1,64%
Independent	29,84%	1,78%	16,54%	62,59%	27,94%	32,18%	28,19%
Controlled Subsidiary	27,55%	77,51%	34,44%	18,84%	30,12%	36,21%	30,49%
Unknown	0,15%	0,00%	0,19%	0,00%	0,15%	0,00%	0,14%
Total	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%

Source: Bankscope

Another important factor for the evolution of the financial sector is the corporate governance structure. Bankscope provides data about the committees working in every bank, through data given for the members of the board of directors. Using this information an index was constructed. The index of Good Corporate Governance Practices is calculated as the sum of the number of committees (remuneration, nomination, risk management, etc.).

Table 8 presents the average of the Good Practice Index for every dimension of the study. The highest numbers are calculated for the banks which have a major controlling shareholder or they are controlled subsidiary. One finding worth mentioning is the high average for the Continental Europe corporate governance system (mainly because some committees are legally mandatory) whereas for the Anglo-Saxon corporate governance system (voluntary adoption of good practices) the average of the index low.

Table 8. Good Practice Index

Good Practices Index	Cont. Europe CG	Anglo Saxon CG	Total
0	279	48	327
1	94	6	100
2	132	6	138
3	34	2	36
4	14	5	19
5	16		16
6	2	1	3
7	1		1
Average	1,075	0,735	1,039
Total	572	68	640

Source: Bankscope

In order to test the hypothesis that there was a change in financial management during the last eight (8) years, a number of ratios have been selected and calculated (see Table 9). NLTA's analysis shows that the banks of countries of the Continental Europe corporate governance system have higher average than the ratios calculated for the Anglo-Saxon countries. Continental Europe countries' are more exposed to loan risk. There was no significant change through time. Hence, the legal, events (scandals) or other initiatives didn't have significant impact in improving this ratio, but it seems that has an impact on the GGL ratio. The ratio seems to be getting smaller through time. The banks reduced their loan growth, in order to maintain the level capitalization of their business.

The ratio ETA (Equity / Total Assets) in the Anglo-Saxon, South and PIGS countries is significantly higher than in the ones of the Continental Europe. The central Europe's economies have lower levels of ETA. The same can be said for the ENL, Tier and TCR ratios. Banks with higher ENL, ETA, Tier and TCR ratios are considered to be better situated to handle risks (operational, credit risk) and have better capital adequacy and they have lower levels of leverage. These ratios do not appear to change through time in every spatial dimension used in this paper.

Finally, the return ratios (ROA and REP) reveal significant differences between Anglo-Saxon and Continental Europe countries (the difference may be attributed to higher leverage levels in central Europe banks). All ratios do not appear to change through time in every spatial dimension used in this paper.

Table 9. Active Banks, Ratios

Ratios*	No	Not PIGS	PIGS	North	South	Cont. Europe CG	Anglo Saxon CG
NLTA	2833	60,24	56,82	54,70	58,88	57,94	40,99
NLTA 3	2841	57,75	55,80	54,48	60,12	56,28	50,01
NLTA 8	2846	57,53	55,75	54,85	58,81	56,30	48,82
ETA	2848	10,55	13,86	10,02	12,91	10,37	16,86
ETA 3	2865	10,52	14,50	10,08	12,78	10,36	17,13
ETA 8	2865	10,50	14,21	9,85	13,30	10,35	16,58
GGL	2802	8,48	1,39	8,74	6,07	7,96	9,99
GGL 3	2813	10,35	6,84	9,69	11,51	9,28	25,17
GGL 8	2815	13,08	14,30	12,16	16,07	12,12	30,69
EL	2845	16,27	21,16	16,13	17,80	15,29	37,32
EL 3	2855	16,87	34,47	16,79	21,23	16,85	35,36
EL 8	2858	16,85	31,61	16,57	21,13	16,55	36,81
TIER	1231	15,03	11,50	13,64	16,44	14,79	18,46
TIER 3	1323	15,25	11,63	13,81	16,77	15,07	16,02
TIER 8	1380	15,46	11,16	13,55	17,67	15,18	17,71
TCR	1745	17,97	15,78	17,83	18,09	17,70	24,85
TCR 3	1745	17,77	15,45	17,37	18,42	17,53	23,16
TCR 8	1747	17,93	15,20	17,27	19,22	17,59	23,56
ENL	2781	26,45	38,14	27,43	26,24	25,35	59,57
ENL 3	2833	29,36	45,01	17,51	25,09	27,74	74,02
ENL 8	2838	29,86	40,86	16,63	26,08	28,29	68,78
ROA	2867	0,22	-0,10	0,27	0,01	0,23	-0,23
ROA 3	2873	0,27	0,01	0,20	0,19	0,22	-0,14
ROA 8	2872	0,34	0,35	0,31	0,43	0,37	-0,02
REP	2867	1,06	1,04	1,13	0,88	1,09	0,69
REP 3	2872	1,04	1,04	1,07	0,93	1,05	0,74
REP 8	2872	1,08	1,14	1,09	1,08	1,11	0,69

Source: Bankscope

* NLTA = Net loans / Total Assets, ETA = Equity / Total Assets, GGL = Growth of Gross Loans, EL = Equity / Liabilities, TCR = Total Capital Ratio, ENL = Equity / Net Loans, ROA = Return on Assets, REP = Recurring Earnings Power. The number 3 indicates that it is the average of three years and the number 8 that it is the average of eight years.

The recent developments of the 2008-2009 crises have created a spatial division of Europe. The financial market handles risk by trying to detect it. Fitch is one of the main ranking agencies. Table 10 and 11 depict the way that Fitch ranked and approached the European financial market. On average the PIGS banks were ranked 14 times and ranked lower than Not PIGS banks. Furthermore, Fitch focused more on the Anglo-Saxon countries banks (15,29 average times). The fact of higher count of rankings can be explained by the interest of the market participants (due to more developed and efficient markets) and their total assets (22% of the total assets of the European banking sector). Overall, the countries that have a large banking sector (in terms of assets and equity) receive better rankings (see Table 10).

Table 10. Active Banks, Fitch ratings (average) per Corporate Governance System

	Cont. Europe		Anglo Saxon	
	Average Ranking	Average Count	Average Ranking	Average Count
Not PIGS	19,68	9,90	17,88	15,29
PIGS	17,20	14,00		
Total	19,62	10,00	17,88	15,29

Table 11. Active Banks, Fitch ratings (average) per Ownership type

Country	GUO	Single Location	Branch	Independent	Controlled Subsidiary	Unknown	Total
Austria	19,00	19,00		19,00	18,44		18,90
Belgium	16,88				20,76		20,11
Bulgaria	12,00				16,20		15,50
Cyprus	15,45				13,40		13,91
Czech Republic					18,50		18,50
Denmark	20,39				19,64		19,83
Estonia					17,15		17,15
Finland					19,90		19,90
France	19,03	19,63	20,86		19,94		19,91
Germany	19,99	19,98		19,99	19,62	20,00	19,98
Greece	16,71				14,33		15,92
Hungary					15,52		15,52
Ireland	20,43				17,95		18,45
Italy	17,44				16,74		17,17
Latvia					11,74	10,86	11,45
Lithuania	11,00	10,56			14,17		12,81
Luxembourg		21,00			19,80		19,98
Malta							
Netherlands	22,88		21,05		17,82		18,51
Poland					17,75		17,75
Portugal	18,42				15,19		16,12
Romania	12,00				15,18		14,72
Slovakia					16,25	16,21	16,23
Slovenia	14,40				17,50		15,73
Spain	18,34	15,00			16,84		17,56
Sweden	20,00		21,00				20,50
UK		18,00	21,45		18,37		18,47
Total	19,68	19,83	21,09	19,98	18,25	15,69	19,58

3. Convergence – divergence of corporate and economic systems

In Europe an economic experiment has been attempted. The legal and economic framework has been changed through a series of directives and policy changes, imposed by European Union. The banking system of Europe as shown in the previous section of the paper has many differences. The goal of the experiment is to create a common economic-legal-political environment. Has argue that this experiment is successful (Carati and Tourani, 2000; Heugens and Otten, 2007) and that economies and systems in Europe are converging. A factor that can summarize the similarities of the micro and macro environment of banks, the corporate governance system. In Europe there are two discrete systems (Anglo-Saxon and Continental Europe systems). Moschieri and Campa (2009) maintain that the two systems are dissimilar in the choice of acquisition techniques, structural characteristics (ownership and corporate governance) and the degree of bank dependence. Mergers and acquisitions (M&As) are an integral element of corporate governance systems.

In the Anglo-Saxon corporate system the preconditions that were suggested for M&As are: a) the low ownership concentration (La Porta et al., 1998) report ownership concentration only 12% in USA, while it is very concentrated in Europe (Faccio and Lang, 2002) and in Greece, it is about 53% (Lazarides, Drimpetas and Koufopoulos, 2009) (the sum of shares of the biggest five shareholders), b) the agency problem. Free cash flow (Jensen, 1986; Shleifer and Vishny, 1992) and capital liquidity (Harford, 2003) triggers the M&A due to the willingness of managers to keep corporate resources under their control. The same argument can be made for Europe but instead of managers, dominant shareholders are the stakeholders that are not willing to release corporate resources to minority shareholders. Leverage (Debt / Equity ratio) is considered to have a negative effect on the likehood of M&As, due to the higher risk exposure of Anglo – Saxon countries. Ghosh and Jain (2000) report a leverage ratio level of 32,7% prior to and a 39,7%

after the M&A. This is consistent with the argument that managers strive to control corporate resources, while shareholders see leverage as an instrument to reduce the effects of the agency problem (Jensen, 1986, c) Mitchell and Mulherin (1996) argue that merger waves result from shocks in the economic, technological, or regulatory environment of an industry. Moschieri and Campa (2009) hypothesize that regulatory and monetary homogenization is one of the drivers of M&A activity in Europe. This is not the case, however, for the regulatory convergence. d) Capital market growth and size (Gaughan, 2002). Huyghebaert and Luypaert, (2009) show that market capitalization as a percentage of GDP equals 133,6% in the USA, whereas the average for EU-countries is only 86,1% and in Greece, it is about 49,1% (in 2004). Overall, the dominant difference in preconditions between Anglo-Saxon and European countries is ownership concentration. Concentrated ownership affects motives, corporate structures, decision making process and growth strategy.

Yang and Hyland (2006) report four strategic motives for M&As: financial synergy, governance efficiency, managerial incentive perspective and revenue balance cyclicalities and reduced risk diversification. These motives may be analysed into the effects of the valuations of the merging firms (Dong et al., 2006; Shleifer and Vishny, 2003), increase in the level of remuneration of managers (Jensen, 1986; Hutchinson and Gul, 2004; Grant, 2003; Kose and Lemma, 1998; Gaver and Gaver, 1993), CEO's overconfidence (Haunschild, Davisblake, and Fichman, 1994), the hubris hypothesis (Roll, 1986), higher abnormal performance after the merger (Sorensen, 2000), legal protection of investors and their interests (Rossi and Volpin, 2004), incentive asymmetries between different actors involved in the acquisition process (Parvinen and Tikkanen, 2007), imitation of other acquisitions of firms (Haunschild, 1993; Yang and Hyland, 2006), and enhancement of the incentives of CEOs and board members (Deutsch, Keil, and Laamanen, 2007; Harford and Li, 2007; North, 2001). In Continental Europe, countries ownership and control concentration mitigates agency problems

There are differences in the payment methods of the M&A transaction between Anglo-Saxon and Continental Europe countries. Moschieri and Campa (2009) report that these differences arise not only from differences in regulation but also from the structural characteristics of the business environment. The latter authors show, in their empirical research, that M&As' payment methods are different in the United Kingdom in comparison to the rest of Europe. The M&A percentage that use "Cash Only" method is more or less the same in both cases. There are differences in the last two columns of Table 12. In the case of the rest of Europe, the combination and "Shares Only" as payment methods are more frequent. This finding is contrary to previous studies (Faccio and Masulis, 2005; Rossi and Volpin, 2004) that report more "Cash Only" deals in the rest of Europe and more "Shares Only" in the UK. The conflicting results of studies may be attributed to the 1999-2000 capital market boom in all European capital markets and the subsequent increase in equity prices and capital liquidity. In Greece the data are more consistent with the Faccio and Masulis (2005) and the Rossi and Volpin (2004) studies (53% "Cash Only" and 26% "Shares Only" and 21% "Cash and Share").

Table 12. M&A Techniques in UK and the Rest of Europe

By value of deals	Cash Only	Shares Only	Cash and Shares
United Kingdom	27%	14%	6%
Rest of Europe	34%	29%	23%

Source: Moschieri and Campa (2009)

Although the strategy of M&A is common in developed countries such as the USA and the UK, it is not common in developing countries like Greece. During the last decade, following a leap in capital market growth (1998-2000) and IPOs, a wave of M&A has taken place in Greece. The paper advocates the hypothesis that in countries like Greece the M&A wave wasn't the result of free cash flow and that after the wave, the structural elements of the corporate environment didn't change in the degree necessary to classify Greece in a different corporate environment group, to establish a new corporate governance system or validate the convergence theory.

4. Data, variables and empirical approach

The data used for the empirical analysis cover the period from 2004 to 2011, is focused on the twenty seven (27) European Union countries and only commercial and cooperative banks. The total numbers of banks, initially, collected from Bankscope were 4.573. After the analysis of outliers the sample was reduced to 4.536 banks (2.873 active and 1.663 inactive).

In order to create a more homogenous and usable sample, the initial data were filtered and new ratios were calculated. The final data is comprised of 640 banks. The selection criteria were: a) size of assets (more than 2 billion Euros) and b) the ratio of Equity to Total Assets is higher than 10%.

The dependent variable (inactivity) is binary and (1 if the bank is inactive and 0 if the bank is

active). A large number of independent variables have been used. More than four metrics of performance (e.g. ROA, ROE, Operating profits, dividends, etc.), size (assets, loans, growth, etc.), capital structure. Overall the number of independent variables as more than 80. It is useful to analyze the sample using the fundamental characteristics of the corporate environment.

Ownership and type of entity variable shows that the sample is not very different from the one that was described in the second section of the paper (see Table 13). 187 inactive banks were found and the majority of them are Single location banks. The majority of inactivity is caused by M&As. A small number is caused from liquidation and bankruptcy (see Table 14).

Table 13. Sample – Entity type

Entity type	GUO*	Single location	Branch locations	Independent companies	Controlled subsidiary	Unknown	Total
Active	58	18	16	10	351		453
Inactive	3	159		4	11	10	187
Total	61	177	16	14	362	10	640

* GUO - Global Ultimate Owner (ownership of at least 50.01%)

Table 14. Sample – Status

Status	Active, no longer with accounts on Bank scope	Dissolved, In liquidation	Dissolved (merger)	Bankruptcy	Total
Active	450	3			453
Inactive		29	156	2	187
Total	450	32	156	2	640

A Good Practice Corporate Governance Index is calculated. The calculation of the index is based on the reported good practices of corporate governance (i.e. duality of roles, audit committee, etc.). The index is the sum of the number of the good practices that were reported. Table 15 shows that majority of the banks involved in a M&A applies none of the good practices. This is an indication that the corporate governance system is weak and perhaps is the underlining factor of the M&A.

Table 15. Sample – Good Corporate Governance Index by Status

	Active, no longer with accounts on Bank scope	Dissolved, In liquidation	Dissolved (merger)	Bankruptcy	Total
0	157	27	142	1	327
1	91	4	5	0	100
2	128	1	8	1	138
3	36	0	0	0	36
4	19	0	0	0	19
5	15	0	1	0	16
6	3	0	0	0	3
7	1	0	0	0	1
Total	450	32	156	2	640

The best performance of the index is observed for the controlled subsidiaries (see Table 16) and the GUO banks. Banks that are more universal or are less ownership concentrated tend to implement a larger number of good practices.

Table 16. Sample – Good Corporate Governance Index by Entity type

	GUO	Single location	Branch locations	Independent companies	Controlled subsidiary	Unknown	Total
0	17	162	13	7	119	9	327
1	7	6	1	2	83	1	100
2	21	8	0	3	106	0	138
3	8	0	0	2	26	0	36
4	3	0	0	0	16	0	19
5	5	1	1	0	9	0	16
6	0	0	0	0	3	0	3
7	0	0	1	0	0	0	1
Total	61	177	16	14	362	10	640

The two corporate governance systems of Europe's banks show different ratio of inactivity. In the Continental Europe system the ratio is 30,6%, while in the Anglo-Saxon system the ratio is almost half (17,6%). This finding is consistent with the hypothesis that the banking sector in Europe has gone through a M&A wave.

Table 17. Sample – Inactivity by corporate governance system

	Continental Europe	Anglo-Saxon	Total
Active	397 (69,4%)	56 (82,4%)	453
Inactive	175 (30,6%)	12 (17,6%)	187
Total	572	68	640

5. Methodology

The methodology presented in this section consists of two main blocks. First a framework for evaluating signals of early warning models and second the estimation and prediction methods.

5.1. Evaluation of model signals

Early warning models require evaluation criteria that account for the nature of the underlying problem (causality). Formulating a model that can be used as an early warning system is a complex task. There are a great number of factors that have to be taken into account. The evaluation of the system is even more complex because there are policies, regulating factors or events that there is not precedence. Furthermore the system has to provide a way to be tested and test the hypothesis and provisions of the model.

Table 18 shows the possible outcomes of the system – model. The first and most comprehensible criteria are the Type I, Type II and T total errors. MType I is the ratio of missing signals (i.e. when no early warning signal was issued despite a crisis occurred or else False Positive (FP)) to the number of periods when a signal should have been issued, while Type II is the ratio of wrong signals (i.e. when a signal was issued while no crisis occurred or else True Negative (TN)) to the number of periods when no signal should have been issued. T total is the sum of Type I and Type II errors.

Table 18. Possible Outcomes

		Predicted Class	
		0	1
Actual Class	0	False Negative (0, 0)	True Negative (0, 1)
	1	False Positive (1, 0)	True Positive (1, 1)

The value of these regressions is their ability to create a table of predictability. All of these metrics are informative, but in different ways. For example, the overall% quickly summarizes the success of a predictive method in a global sense. However, when there is an extreme imbalance between the two kinds of events being classified, then it is easy to formulate a useless rule with a very high overall% – just predict that every event will be the more frequent type. In our case, such a "no-brainer" rule is to predict that every quarter will be a non-crisis. Overall% mostly measures success in classifying the more frequent event type. A method can have very poor predictive success with the low frequency event and still score very highly on overall%. Sensitivity addresses success in classifying the event type (crisis) that is probably of most interest to the decision-maker: What proportion of crises is correctly predicted? However, a "no-brainer" rule that predicts every quarter to be a crisis will score perfectly on this measure. A tradeoff between success with crises and success with non-crises is necessary. Specificity measures success at predicting non-crises. Sensitivity and specificity are useful tools for the development of a prediction rule. In the development phase, one tests a potential rule on events whose true binary classification is known and assesses how many of each type are correctly classified. A good potential rule should have high success rate in each type. However, it is possible for a predictive rule to have both high sensitivity and high sensitivity and yet be poor at prediction. This seemingly paradoxical situation occurs when there is an extreme imbalance between the two types of events and the potential rule generates a large number of false positives (C). The sensitivity and specificity metrics are supplemented with TPR and TNR, which measure the proportion of predictions that are correct. Indeed, many policymakers may be interested only in the success rate of their predictions. If so, then TPR and TNR are of primary importance. Sensitivity and specificity are retrospective and developmental measures; TPR and TNR are potentially prospective and implicational.

5.2. Estimation and prediction

The task to extract signals from indicators can be done by using probit – logit analysis transforms the

variable into crisis probabilities (eg. Demirguc Kunt and Detragiache, 1998). Thus logit analysis is preferred over probit analysis as it's assumptions of more fat tailed error distribution corresponds better to the banking crisis and bank distress events (van den Berg et al., 2008).

In a discrete choice model, a binary classification set-up first maps various explanatory variables into the probability of a systemic banking crisis, i.e. either a probit or a logit mapping function transforms the variables into a continuous indicator variable between 0 and 1. This indicates the crises probability. If the probability exceeds a specified threshold, a signal is issued. A discrete choice model can include one or several indicator variables at a time. While in the case of the multivariate signalling approach a joint condition needs to be fulfilled for a crisis to be signaled (e.g. all indicator variables breaching a specific threshold), in a multivariate discrete choice model each variable included reflects the marginal contribution of that variable. All variables then jointly determine a continuous crisis probability which, when exceeding a specific (optimised) threshold, signals a crisis.

The multivariate logit approach allowed Demirguc - Kunt and Detragiache (1998) to relate the likelihood of occurrence or non-occurrence of a banking crisis to a vector of n explanatory variables. The probability that the banking dummy takes a value of one (crisis occurs) at a point in time is given by the value of the logistic cumulative distribution evaluated for the data and parameters at that point in time.

6. Empirical results

A number or regressions have been attempted in order to find a suitable early warning system of inactivity. The total number of regressions is six. Three econometric methods have been used in each model (Probit, Logit and OLS). These regressions are seeking to find the indicators of inactivity. Three main inactivity causes are examined. The first one is generic and covers the total number of causes, the second examines the indicators for the dissolved or in liquidation banks and the third the main reason – cause, which is the M&As.

In all regressions an indicator of size, performance, ownership, capital structure and corporate governance. Each and every one of these indicators have been identified as compatible with the theories of crises, inactivity and bank failure.

6.1. All causes

The results of the regressions for all causes or phenomena of inactivity has an overall predictive rate of 87,2%. Alternatively, a different measure of performance has been used (Net Income - Cash Dividends/ Total Equity, Nicdte). This model even though it has high overall predictability, the independent variables (Nicdte) are not in all models statistical important. An alternative for the performance indicator (ROA and ROE) is used to compensate for this problem. The model with ROA has the same predictability, but the performance variable is not statistical important as well.

ROE seems to be a better performance indicator (see Tables 19 and 20). The predictability is slightly better (88.1%) and all predictors are statistical important.

Table 19. Regression 3

METHOD	Optimal Error Criterion	Overall%	Sensitivity = TPR =1-P(Type I error)	PPV = Precision Positive	Specificity = TNR = 1-P(Type II error)	NPV = Precision Negative
Logistic regression	0,257	88,1	83,2	76,2	90,0	93,3
Probit regression	0,257	88,1	83,2	76,2	90,0	93,3
OLS regression	0,270	88,0	80,3	77,2	90,9	92,3

Table 20. Regression 3, Predictors

Predictor	Probit	Logit	OLS
GoodPractIndex	-0,5837***	-1,1769***	-0,1006***
Entity_type	-0,4937***	-0,8712***	-0,1340***
Et	-0,0368*	-0,0684***	-0.0073***
Roe	0,0114***	0,0210**	0,0011**
Constant	1,6722***	2,9911***	0,9396***

* p<0.05; ** p<0.01; *** p<0.001

The second set of model is focused on the cases of "In liquidation status. The same regressions have been used. In this case as well ROE as a performance variable is a better indicator (See Tables 21-24). The predictability is at the same levels (88%).

Table 21. Regression 4 (Dissolved, In liquidation)

METHOD	Optimal Error Criterion	Overall%	Sensitivity = TPR =1-P(Type I error)	PPV = Precision Positive	Specificity = TNR = 1-P(Type II error)	NPV = Precision Negative
Logistic regression	1,130	89,4	63,9	37,1	91,4	97,0
Probit regression	1,130	89,4	63,9	37,1	91,4	97,0
OLS regression	1,240	87,3	69,4	32,9	88,7	97,3

Table 22. Regression 4, Predictors

Predictor	Probit	Logit	OLS
GoodPractIndex	-0,6838***	-1,3394***	-0,0432***
Entity_type	-0,3128***	-0,5792***	-0,0461***
Et	-0,0153	-0,0249	-0.0018
Roa	-0,0554	-0,0892	0,0062
Constant	0,2550	0,5696	0,3385***

* p<0.05; ** p<0.01; *** p<0.001

Table 23. Regression 5 (Dissolved, In liquidation)

METHOD	Optimal Error Criterion	Overall%	Sensitivity = TPR =1-P(Type I error)	PPV = Precision Positive	Specificity = TNR = 1-P(Type II error)	NPV = Precision Negative
Logistic regression	0,257	88,1	83,2	76,2	90,0	93,3
Probit regression	0,257	88,1	83,2	76,2	90,0	93,3
OLS regression	0,270	88,0	80,3	77,2	90,9	92,3

Table 24. Regression 5, Predictors

Predictor	Probit	Logit	OLS
GoodPractIndex	-0,5837***	-1,1769***	-0,1006***
Entity_type	-0,4937***	-0,8712***	-0,1340***
Et	-0,0368*	-0,0684*	-0.0073***
Roe	-0,0114***	-0,0210**	0,0011**
Constant	1,6722***	2,9911	0,9396***

* p<0.05; ** p<0.01; *** p<0.001

As it has been noted, M&As is the main cause of inactivity. In this case, as well, ROA is a better performance indicator – predictor. The overall predictability is better (88.4%).

Table 25. Regression 6 (M&As)

METHOD	Optimal Error Criterion	Overall%	Sensitivity = TPR =1-P(Type I error)	PPV = Precision Positive	Specificity = TNR = 1-P(Type II error)	NPV = Precision Negative
Logistic regression	0,263	88,4	79,2	79,2	92,0	92,0
Probit regression	0,264	88,1	80,9	77,3	90,9	92,5
OLS regression	0,271	87,8	80,9	76,5	90,4	92,5

Table 26. Regression 6, Predictors

Predictor	Probit	Logit	OLS
GoodPractIndex	-0,5828***	-1,1757***	-0,1003***
Entity_type	-0,4923***	-0,8654***	-0,1354***
Et	-0,0459**	-0,0853**	-0.0080***
Roa	0,1448**	0,2443*	0,0251**
Constant	1,7333***	3,1087***	0,9450***

* p<0.05; ** p<0.01; *** p<0.001

7. Discussion - Conclusions

Bankruptcy has been found to be a phenomenon that doesn't happen often. On the contrary, M&As and liquidation are the main inactivity phenomena. In all other events or causes (total causes, in liquidation, M&As), all groups of indicators (performance, size, ownership, corporate governance) except two (capital adequacy or capital structure and growth) are statistical important. This finding is very important because it shows that emphasis is given on more dynamic indicators (performance and size), corporate governance and ownership.

Capital adequacy and solvency didn't improve, despite the alarming events that took place during the last 10-12 years. Banks have become more restrained in their credit expansion (probably because they were obliged to do so, due to stricter regulation). There are no evidence of financial development or the possibility of reaching the previous levels of profitability and activity (see for example the GGL and ROA ratio).

Especially, the last two groups of indicators that are statistical important (ownership, corporate governance) can be seen as opportunity indicators sue to the fact that the predicted sign is negative. Hence, higher number of corporate governance good practices applied and as ownership concentration is higher or the bank is a subsidiary or independent, the probability of inactivity is smaller. On the contrary, as size and performance gets bigger and better, so does the probability to be a merge target.

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