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THE BANKING SECTOR FINANCIAL RESTRUCTURING: SOME EVIDENCE FOR THE LAST DECADE IN THE UNITED KINGDOM

By

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Abstract

This paper uses event study methodology to investigate the banking sector restructuring in United Kingdom. Three large banks have been selected, namely Barclays, Lloyds and National Westminster. The events analysed were changes in group structure, mergers, acquisitions and disposals. The empirical results indicate the impact that these events cause in British banks' stock returns. The effort is to identify and forecast the way that shares prices and generally securities react to market or individual bank's announcements. The study concentrates on the effect that certain unanticipated events have on banks' stock prices. JEL classification codes: G21, G34

Keywords: *Bank Restructuring, Mergers, Acquisitions, Disposals, Event Study analysis.*

1. Introduction

This article measures the returns in the period prior to and after the day a stock repurchase was announced for a sufficient sample of British bank securities. Although the dates of the stock repurchase announcements differed over time, the pre-event and post event periods were uniform in relation to the event. The average returns tested in the pre-event and post event periods indicate that they are significantly different from each other. The approach assumes that capital markets respond efficiently to publicly available news.

In the beginning of the study it was not expected that an event would definitely have a positive or negative effect on a firm due to the fact that these re-

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suits might be market's signals. Also, these results impose the shareholders' personal expectations.

The research examines the impact that possible announcements of bank events, like mergers, acquisitions and disposals cause to stock returns. The aim of this paper is to investigate and identify the way (positive or negative) that share prices react to these 'events'.

The second section of this paper discusses the general characteristics of the global economy as well as the UK bank system; the third section analyses the main methodological issues and the fourth section describes the data. The fifth section presents the empirical results and finally, the article is completed with the inscription of the basic conclusions as they came forth from the research.

2. Globalisation and UK Bank System

Globalisation has become the most popular economic term nowadays. National economies are undoubtedly becoming more integrated as cross-border flows of trade, investment and financial capital increase. Consumers are buying more foreign goods and a growing number of firms operate across national borders.

Firms are now organised at a global level and are integrated internationally more than ever. The information technology has reduced the need for physical contact between investors and leaders. Any activity that can be conducted on a screen or over the telephone can be carried out anywhere in the world, linked to the head office by a satellite and a computer. Likewise, the growth of multinational firms is linked with all these innovations. Since communication is easier, a high quality of information is available instantly, and trading across the world has fewer barriers.

If the world markets for capital were perfectly integrated, identical assets would command the same price everywhere and would have equal interest rates and returns. Therefore, opportunities across countries for gaining money exist by investing in particular securities and markets. The above causes increased competition amongst investors and financial institutions. Banks attempt to increase their transactions and trade throughout the world in order to secure their own existence and maintain their power. In this global market only the strong will survive. Multinational firms do not necessarily open branches in all countries. Instead, they often acquire or merge with other national or international companies.

In the banking sector there have been many changes which include buying and selling firms, as well as changes within the banking structure. The latter for example, could be changes in the Executive Boards and Boards of Directors. What is more common is that banks diversify their portfolio by dealing with new products and securities, and entering new markets. Generally, the main target set by a bank is the achievement of a better performance and higher profits. However, the way each bank acts depends exclusively on its priorities.

In many cases, balance over the global market is not easy to maintain. There have been crises, some of which have affected the global markets as a whole. For instance, a banking crisis in the national market occurred in Japan in 1998 at which time the Japanese government researched for a way to deal with the country's failing financial institutions. Another example is Bankamerica, which became America's fourth-largest bank, due to its merge with Nations Bank, when it announced that it had been hurt by its exposure to emerging markets[1].

This paper was designed to test and analyse financial events and their effects on share prices of UK banks. It also covers their efforts in order to internationalise their trade and stabilise their position in the financial markets. In this study, three banks out of the four, which primarily composed the UK clearing system, have been selected (almost the whole of the British banking system during the '90s). These three financial institutions are Barclays Bank, the National Westminster Bank and the Lloyds TSB Group. The fourth bank not selected was Midland Bank, which was acquired by the Hongkong and Shanghai Banking Corporation Limited in 1992. Since the acquisition HSBC Midland is part of the HSBC Group and therefore, decisions taken by them affects the whole group.

The aim is not only to analyse the events of large UK banks, but also to understand how conclusions can be drawn from UK bank restructuring. There have been many changes in legislation affecting the operation of the banking sector both nationally and internationally, during the last two decades. It is expected to find that this legislation and deregulation is first, leading the banks towards financial conglomerates (Wesson, 1985, page 352), second, letting them work in an international network with branches abroad (globalisation) and third, enabling them to expand their business as long as they can trade foreign currencies and co-operate with financial institutions abroad (Gilbody, 1988, page 123).

Competition is increasingly growing amongst the financial institutions and hence banks are being developed in a new framework, where changes are rapidly occurring. Therefore, UK banks have significantly changed their structure during the last decade (90's), in order to respond to worldwide financial trends.

3. Methodological Issues

3.1 Event Study Analysis

Economists are frequently asked to measure the effect of an economic event on the value of a firm. On the surface this seems like a difficult task, but a measure can be constructed easily using financial market data in an event study. The usefulness of such a study comes from the fact that, given rationality in the marketplace, the effect of an event will be reflected immediately in asset prices. Thus the event's economic impact can be measured using asset prices observed over a relatively short time period. In contrast, direct measures may require many months or even years of observation.

The general applicability of the event-study methodology has led to its wide use. In the academic accounting, banking (Kramer L, 1999, p: 233 and Bessler W. and Murtagh J.P, 2002, p: 422) and finance field (Jun C, Chan K.C, and Yamada T, 1998, p: 237), event-study methodology has been applied to a variety of firm-specific and economy-wide events. Some examples include mergers (Cybo-Ottone A. and Murgia M, 2000, p: 842 and Kane E, 2000, p: 673) and acquisitions (European Central Bank, 2000, p: 129), earning 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, and in legal liability cases event studies are used to assess damages (Blacconiere W. and Northcutt D, 1997, p: 149). In most 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. This methodology is also used in testing semi-strong market efficiency in stock exchanges (Tsangarakis N. V, 1996, p: 23), signaling theory in unexpected events and measuring prices performance in several financial aspects (Simpson J.D. and Hoksen D, 2000, p: 23).

Event study methodology may be interpreted as analysing the market's reaction to 'events' or as an empirical investing of the relationship between secu-

rity prices and economic informational events such as mergers, acquisitions, dividends announcements, issuing new stocks[2] etc.

After specifying the basic periods, which have no surprising events and determining the precise day of the event, the event windows were defined. The length of those was big enough not to lead to overlapping events. The model (Mills *et al,* 1994), tested is the following (Single Index Market Model, SIMM):

$$Y_{it} = \alpha_i + \beta_i X_{it} + \varepsilon_{it} \quad (1)$$

where t=1,2,...,T

Y_t = the return on firm's security

X_t = the market return

ε_t = the error term

α_i = the parameter that indicates the security specific risk

β_i = the parameter that indicates the slope coefficient

i = security of the firm analysed, equals to 1, ..., N

However, in case of using bank stock returns the model is:

$$R_{Comp,t} = \alpha_{Comp} + \beta_{Comp} R_{BANKS,t} + \varepsilon_{Comp,t} \quad (2)$$

or

$$log\left(\frac{P_{Comp,t}}{P_{Comp,t-1}}\right) = a_{Comp} + \beta_{Comp} \log\left(\frac{P_{BANKS,t}}{P_{BANKS,t-1}}\right) + \varepsilon_{Comp,t} \quad (3)$$

where $R_{Comp,t} = \log\left(\frac{P_{Comp,t}}{P_{Comp,t-1}}\right)$ is the return on the examined company's security in period t

$R_{BANKS,t} = \log\left(\frac{P_{BANKS,t}}{P_{BANKS,(t-1)}}\right)$ is the return on the market or industry sector or banking sector in period t.

According to Dnes and Seaton (1995a, 1995b), the daily stock-market returns are measured by

$$\ln R = \ln\left(\frac{P(t)}{P(t-1)}\right) \tag{4}$$

Although they found that

$$R = \frac{P(t)-P(t-1)}{P(t-1)} \tag{5}$$

tended to produce similar results the logarithmic form produces a more symmetrical distribution.

The next step was to determine the precise day of the announcement. This day will be defined as the day zero of the event. The employed data can be daily, weekly or monthly. It is often, in the event study methodology to use daily data. The latter allow the distinction of the events that might occur in a short period, for instance one-month. The definition of the period to be studied is the fourth step. The zero day, the day that the event was publicly known or announced is usually in the middle or close to the middle of the time interval. The use of the basic period is to forecast the expected returns for the event period. This will illustrate how the returns have behaved if the event had not existed.

In our case the events tested are mergers, acquitions, disposals etc. For each event the market model was estimated on daily data for an estimation period of 80 to 140 trading days, according to the firm, and an event period of 20 to 60 days.

The difference between the actual and the predicted return for each security is the abnormal return $\hat{u}_{it}$. For each day τ of the event period the average abnormal return (AR) will be computed, which is the summary of all the abnormal returns of the securities of this specific day:

$$AR_t = N^{-1}\sum_{i=1}^{N}\hat{u}_{it} \qquad \tau = T+1,\ldots,T+M \tag{6}$$

where, N is the number of all the i securities on each event day

Finally, the calculation of the cumulative abnormal return (CAR) as the last stage before the discussion of the results follows. The CAR indicates whether the event had a positive or a negative effect on the firm

$$CAR_{M1,M2} = \sum_{T=M1}^{M2} AR_{T+J} \qquad 1 \leq M_1 \leq M_2 \leq M \tag{7}$$

The assumptions are: first, the data are measured in event time and second, events for each security may occur at different event times. Moreover, securities must be listed in the London International Stock Exchange with a daily excess return for each security on a specific day.

In order to compute the Average Cumulative Abnormal Returns for a specific event period we test the null hypothesis, CAR = 0, of no reaction to the event. The statistical significance of the CARs found were tested with t statistic,

$$t = CAR/\sqrt{T} \times S\ (AR) \tag{8}$$

where, S(AR) is the sample standard deviation of the abnormal returns during the estimation period and

$T = t_2 - t_1 + 1$: where t_1 is the first day of the period for which the CAR is calculated and t_2 is the last.

3.2 Other Statistical Methods

A number of other statistical models have been proposed for modeling the normal return. A general type of statistical model is the factor model. Factor models potentially provide the benefit of reducing the variance of the abnormal return by explaining more of the variation in the normal return. Typically the factors are portfolios of traded securities. The market model is an example of a one-factor model, but in a multifactor model one might include industry indexes in addition to the market.

Sharpe, Alexander, and Bailey (1995) discuss index models with factors based on industry classification. Another variant of a factor model is a procedure, which calculates the abnormal return by taking the difference between the actual return and a portfolio of firms of similar size, where size is measured by market value of equity. In this approach typically ten size groups are considered and the loading on the size portfolios is restricted to unity. This proce-

dure implicitly assumes that expected return is directly related to the market value of equity.

In practice the gains from employing multifactor models for event studies are limited. The reason for this is that the marginal explanatory power of additional factors beyond the market factor is small, and hence there is little reduction in the variance of the abnormal return. The variance reduction will typically be greatest in cases where the sample firms have a common characteristic, for example they are all members of one industry or they are all firms concentrated in one market capitalization group. In these cases the use of a multifactor model warrants consideration.

Sometimes limited data availability may dictate the use of a restricted model such as the market-adjusted-return-model. For some events it is not feasible to have a pre-event estimation period for the normal model parameters, and a market-adjusted abnormal return is used. The market-adjusted-return model can be viewed as a restricted market model with a_i constrained to be 0 and b_i constrained to be 1. Since the model coefficients are prespecified, an estimation period is not required to obtain parameter estimates. This model is often used to study the underpricing of initial public offerings. A general recommendation is to use such restricted models only as a last resort, and to keep in mind that biases may arise if the restrictions are false.

4. The Data Collection

The data employed consisted of daily share prices obtained from London Stock Exchange, Datastream and the Financial Times. The sample period started 1st of January 1992 till 31st of December 2000. We were only concentrated on the study of share prices and not on other securities. The reason for this is that we were interested in looking at the effects that 'events' cause to share prices. Dnes and Seaton (1995a, 1995b), have written similar papers, concentrated also on share prices and their returns.

A careful research of the banks' annual reports, reviews, accounts and financial statements, enabled us to study the events that occurred that period. In addition, we have cross-checked these events by researching the index of the Financial Times. For these reasons, we have a high possibility to distinguish and analyse the events and choose the most important ones for our study. Since the financial information has been gathered from the banks' publications we are very cautious. We are not readily aware of various events affecting the share prices since they may not be published. However, the most important of

them have been captured and examined (almost all sample of the major banks' events during the 90's).

The ten following events selected to be analysed are:

In Barclays environment (table 3)

- the disposal of the Group's retail banking business in Australia to St. George Bank on April the 5th, 1994 (Event 1),
- the disposal of Barclays Business Credit on January the 31st, 1995 (Event 2),
- the disposal of Masterworks - a division of Barclays Global Investors on August the 29th, 1997 (Event 3),
- the changes in Group structure, where the main business was organised in four groupings: Retail Financial Services, UK Business Banking, Barclays Capital, BGI on April the 1st, 1998 (Event 4).

In Lloyds environment (table 4)

- the announcement of the merger with TSB Group on October the 12th, 1995 (Eventl),
- the merger with TSB and the involved necessary changes in the Group structure, on December the 28th, 1995 (Event 2),
- the change of Deputy Chairman, when John Davies retired and Alan Moore replaced him on July the 31st, 1997 (Event 3).

In NatWest environment (table 5)

- the Deputy Chairman and Chief Executive changes when Rt. Hon. Douglas Hund became a director of the Bank and Deputy Chairman of NatWest Markets and Bernard P Horn became Chief Executive in international businesses, on October the 10th, 1995 (Event 1),
- the acquisition of Gartmore plc, on February the 19th, 1996 (Event 2),
- the change in Group structure, when NatWest Wealth Management was formed, which is the grouping of four NatWest businesses on April the 1st, 1997 (Event 3).

5. Empirical Results

First, we investigated for stationarity using both the Augmented Dickey Fuller (ADF) and the Phillips-Perron test (PP). To determine the order of each price series, the Dickey-Fuller and the Augmented Dickey-Fuller tests (Dickey and Fuller, 1981) are computed on the levels of each price series. Performing the tests on the levels of each series shows that the null hypothesis of a unit root is not rejected; thus, each series is I (0) (see Table 1). On the contrary, the results of the tests on the first differences indicate that each of the series is I (1). Table 2 reports the results of the Unit roots tests. If the returns were not stationary, then we would not be able to proceed with the estimations.

Several diagnostic tests were carried out: tests for higher order autocorrelation (Breusch-Godfrey test), for heteroskedasticity (White test), for model misspecification (Ramsey test), for parameter stability (Chow break-point test or Chow forecast test) and finally, for the presence of ARCH effect. In Chow tests the breakpoint dates were the zero days of the events and dates such as the change of a year or a term for accounting periods.

While testing the basic periods, we expected to have high goodness of fit, so that the forecasts would be efficient. R^2 was not expected to be as high as 90% (which is assumed to be satisfactory for time series data), because the use of differences or returns of share prices, which overcome the problem of time trend, leads to lose of information. Tables 3, 4 and 5 present the results for every event and basic periods for Barclays, NatWest and Lloyds respectively and all the diagnostic tests employed.

In more detail within this research we see the effect that, the appointment of a new Deputy Chairman and a new Chief Executive of international business in NatWest had a negative result (CAR of -28.9362). On the other hand, the same event in Lloyds had a higher negative effect than NatWest (CAR of -351.889).

The negative returns means that the actual effect was less than the estimated one, which also shows that the shareholders were cautious about these changes and about their own investment. They preferred to wait until the new deputy chairman really justified his appointment and began to ensure the company's profitable performance. The changes were based on a peaceful process, which was expected, because the previous Deputy Chairmen were leaving the company due to retirement. Otherwise the returns would have had much higher negative values (Dahya et al, 1994, page 36).

These negative figures are not surprising, since changes to a group structure is very costly and need plenty of time to be completed. Reforming a company demands a well-organised strategy. People may change duties after being trained and it takes time for all employees to get used to the new policies or even to the new computer programmes. These high negative results may be due to rather expensive changes in the structure than to shareholders' loss of faith.

As far as disposals are concerned we could say that the first one in Barclays'is an international disposal, which caused a positive effect (CAR of 257.5353). The second is a national one and it caused an opposite result (CAR of -402.274) and the third, a national one as well, led to another positive cumulative return (CAR of 2.192).

These very interesting results show that the same event in the same bank may cause extremely different effects. We have one negative result and two positives, one of which is very high.

One way to explain this is by making the following assumptions. These results might be linked to the information shareholders had about the companies being sold. If shareholders did not really mind whether a company will be sold or not, then the final effect would only be caused by the money gained from the sale. This could be the first case (event 1 of Barclays) of positive return, which is an international disposal. Barclays shareholders may not mind about a company being sold abroad. If the company sold was well performing, then shareholders might be afraid that Barclays would have only short-term gains. In the long-run essential profits might be lost. This causes a negative final effect on the disposal (event 2 of Barclays). If a shareholder found out that the firm sold was not performing so well, then this would be good news. The final effect, can be a high positive result (event 3 of Barclays) caused by the profits of the sale and by the satisfaction of the shareholders.

6. Practical Implications

The implications of this study practically could be found on the reaction that the investors would show when banking "events", such as mergers, acquisitions, etc., are announced and secondly on the performance of the financial events measured.

More specifically, continuing our research we could say that the announcement of a merger is expected to be positive, when the company to merge with

is well performing. A merger is a sign of expansion and this could be good news to shareholders, who feel that they will own healthy companies.

The real merger might also cause a high negative result not because shareholders changed their mind about the merger, but because the merger itself takes time to be completed and large amounts of money need to be spent. After a merger, a new company is formed and the public is usually being informed by advertisements. All Boards of Directors and Executive Boards are usually changed and reformed. The strategies have to be adjusted, as well as the company's priorities. For example, changing the company's logo, sufficient funds are required. Moreover, departments that were operating in two different firms, now have to be united and changes in employee group structure may occur. It is also noted that a merger can not be completed in one day, it takes months.

A question that arises is why a merger causes negative impact on the new-formed firm. In their paper, Brook *et al*, (1997) found that a more active market should increase firm values in at least two ways. The unrestricted consolidation would allow firms to better utilise potential scale and scope economies available from mergers. The evidence from our sample indicates that the results are contradicted (one positive and one negative CAR).

The last comparison made is between events that are supposed to be similar, such as mergers and acquisitions and events that are supposed to be different (opposite) such as mergers and disposals.

We have already explained the effects of disposals (occurred in Barclays) and the effect from the merger of Lloyds with TSB. The acquisition examined caused a positive result (CAR of 433.906), that means the actual effect was higher than the estimated. So the acquisition had a positive impact on the bank's share prices. We would have expected though that an acquisition could have a negative impact, because funds are needed in order to buy a firm. However, we assume that this is not the case and the reasons follow. The first reason suspected is that shareholders may believe that an acquisition will increase the company's performance, and thus their wealth. Like in disposals, this is not referring to all acquisitions. It is possible that an acquisition will have a negative or a positive effect. This means that an acquisition and a disposal may lead to similar impacts on the same or different firms.

Comparing the merger with the acquisition, we found that they caused different results. Despite the fact that someone would expect to discover similar

impacts, this may not be the case. Finally, disposals and acquisitions may have either positive or negative effect to a firm, whereas a merger is usually linked with high negative effects. Table 6 presents the distribution of the average cumulative abnormal returns and the statistical significance of all the 'events' investigated.

7. Conclusions

Banks, in order to stabilise their position in the national and global financial markets, they take decisions such as changing their managers and directors, as well as their group structure and disposing of, acquiring or merging with other companies. In this study we analysed the effects of these decisions on banks shareholders in order to understand whether these events had a positive or negative impact on the share prices.

This research showed that disposals and acquisitions could not be predicted precisely, as far as the returns of the announcements are concern, because they can either cause negative or positive reaction. The announcement of the merger was treated as a sign of good news by the shareholders and so, it had positive return.

On the other hand, the deputy chairman change, the group structure and the merger had negative results. Moreover, the merger had the highest negative cumulative abnormal return, followed by the group structure and then the deputy chairman change. The group structure has a negative effect on the firm because it takes a lot of time and funds in order to be completed. A merger needs large amounts of money and it includes changes in the group structure, because two companies have to be combined in one. The return of the deputy chairman change was affected by the shareholders' personal opinions about the company's performance and their best interest. Sometimes rumours play an important role, which influence investors' opinions. In addition, if a chairman was thought to be inefficient, then his departure from the company would cause positive return. In many cases however, a result may illustrate a market signal.

This paper indicates that there are events, such as mergers or changes in-group structure, which can be expected to have a specific impact on the firm's share prices. There are also events, such as disposals and acquisitions, that can not be predicted, even in a considered efficient banking system like that of UK.

Appendix

TABLE 1

ADF and PP unit root tests in levels

BANKS			
ADF Test Statistic	0.143151	1% Critical Value*	-3.4379
		5%	-2.8640
		10%	-2.5681
PP Test Statistic	0.168442	1% Critical Value*	-3.4379
		5%	-2.8640
		10%	-2.5681
LLOYDS			
ADF Test Statistic	0.064521	1% Critical Value*	-2.5672
		5%	-1.9396
		10%	-1.6157
PP Test Statistic	0.062205	1% Critical Value*	-2.5672
		5%	-1.9396
		10%	-1.6157
BARCLAYS			
ADF Test Statistic	-1.956516	1% Critical Value*	-3.9698
		5%	-3.4155
		10%	-3.1296
PP Test Statistic	-1.936102	1% Critical Value*	-3.9698
		5%	-3.4155
		10%	-3.1296
NATWEST			
ADF Test Statistic	1.368346	1% Critical Value*	-2.5672
		5%	-1.9396
		10%	-1.6157
PP Test Statistic	1.389057	1% Critical Value*	-2.5672
		5%	-1.9396
		10%	-1.6157

Notes: The values are the first differences of the logarithms.
*The critical values for ADF and PP test statistics.

TABLE 2

ADF and PP unit root tests in first differences

BANKS			
ADF Test Statistic	-24.61525**	1% Critical Value*	-3.4379
		5%	-2.8641
		10%	-2.5681
PP Test Statistic	33.05914**	1% Critical Value*	-3.4379
		5%	-2.8640
		10%	-2.5681

LLOYDS			
ADF Test Statistic	-26.08583**	1% Critical Value*	-3.4379
		5%	-2.8641
		10%	-2.5681
PP Test Statistic	-35.64400**	1% Critical Value*	-3.4379
		5%	-2.8640
		10%	-2.5681

BARCLAYS			
ADF Test Statistic	-26.82565**	1% Critical Value*	-3.4379
		5%	-2.8641
		10%	-2.5681
PP Test Statistic	-34.18055**	1% Critical Value*	-3.4379
		5%	-2.8640
		10%	-2.5681

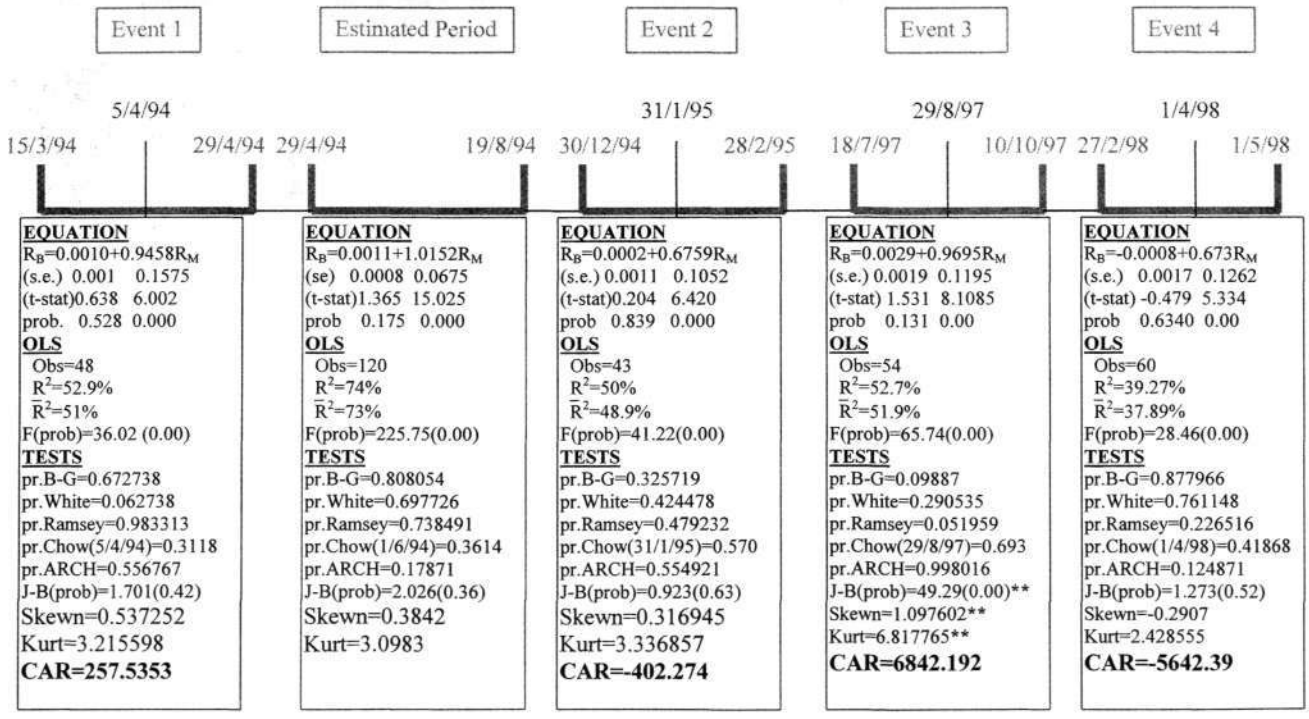
NATWEST			
ADF Test Statistic	-26.14418**	1% Critical Value*	-3.4379
		5%	-2.8641
		10%	-2.5681
PP Test Statistic	-34.37903**	1% Critical Value*	-3.4379
		5%	-2.8640
		10%	-2.5681

Notes: The values are the first differences of the logarithms.
The critical values for ADF and PP test statistics.
**Statistically significant at all confidence intervals.

TABLE 3

Time Map and OLS outputs for the events of Barclays. Source: Barclays Annual Reports, 1992-2000.

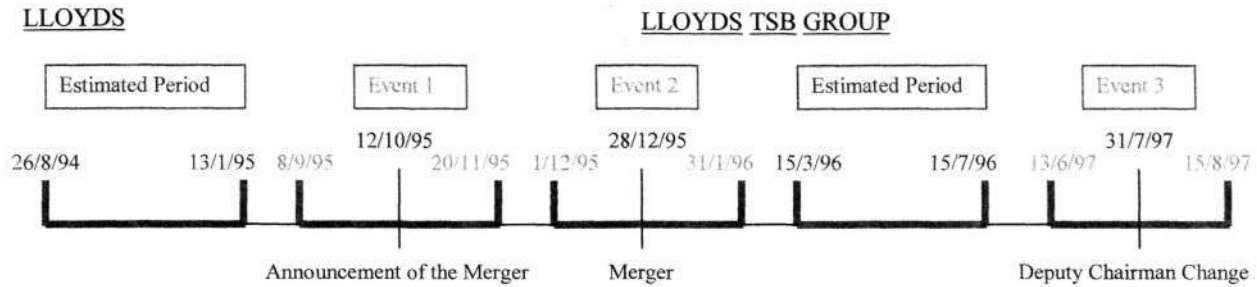
BARCLAYS



= Reject the null hypothesis at 5% s.l.

TABLE 4

Time Map and OLS outputs for the events of Lloyds TSB Group. Source: Lloyds TSB Group Annual Reports, 1992-2000.



EQUATION R_L=0.0001+1.0123R_M (s.e.) 0.0007 0.0688 (t-stat) 0.2671 14.714 prob 0.7899 0.000 **OLS** Obs=121 R^2=68.6% $\bar{R}^2$=68.3% F(prob)=216.51(0.00) **TESTS** pr.B-G=0.534533 pr.White=0.260095 pr.Ramsey=0.64773 pr.Chow(30/12/94)=0.14 pr.ARCH=0.151195 J-B(prob)=1.493(0.47) Skewn=0.297508 Kurt=3.027461	**EQUATION** R_L=0.0016+0.847R_M (s.e.) 0.0014 0.1379 (t-stat) 1.1694 6.141 prob 0.2478 0.000 **OLS** Obs=52 R^2=42.9% $\bar{R}^2$=41.8% F(prob)=37.718(0.00) **TESTS** pr.B-G=0.975404 pr.White=0.268722 pr.Ramsey=0.251248 pr.Chow(12/10/95)=0.08 pr.ARCH=0.757931 J-B(prob)=405.5(0.00)** Skewn=2.544605** Kurt=15.69868** **CAR=575.5506**	***EQUATION*** *R_L=-0.002+0.5337R_M* *(s.e.) 0.0028 0.3016* *(t-stat) -0.806 1.7692* *prob 0.4247 0.0841* ***OLS*** *Obs=44* *R^2=6.93%* *$\bar{R}^2$=4.72%* *F(prob)=3.130(0.084)* ***TESTS*** *pr.B-G=0.275372* *pr.White=0.669131* *pr.Ramsey=0.895518* *pr.Chow(28/12/95)=0.27* *pr.ARCH=0.442897* *J-B(prob)=0.415(0.81)* *Skewn=-0.232927* *Kurt=3.099441* **CAR=-13668.8**	**EQUATION** R_L=0.0002+1.3879R_M (s.e.) 0.0008 0.094 (t-stat) 0.245 14.756 prob 0.8066 0.000 **OLS** Obs=143 R^2=71.9% $\bar{R}^2$=71.5% F(prob)=217.76(0.00) **TESTS** pr.B-G=0.253994 pr.White=0.113662 pr.Ramsey=0.859598 pr.Chow(12/4/96)=0.750 pr.ARCH=0.724896 J-B(prob)=0.653(0.72) Skewn=-0.172162 Kurt=2.751839	**EQUATION** R_L=0.0004+1.4173R_M (s.e.) 0.0019 0.127 (t-stat) 0.2051 11.158 prob 0.8384 0.00 **OLS** Obs=46 R^2=73.8% $\bar{R}^2$=73.2% F(prob)=124.51(0.00) **TESTS** pr.B-G=0.108866 pr.White=0.680624 pr.Ramsey=0.163643 pr.Chow(31/7/97)=0.485 pr.ARCH=0.791501 J-B(prob)=166.7(0.00)** Skewn=2.271296** Kurt=11.14765** **CAR=-351.889**

* = Reject the null hypothesis at 5% s.l.

TABLE 5

Time Map and OLS outputs for the events of NatWest. Source: NatWest Annual Reports, 1992-2000.

NATWEST

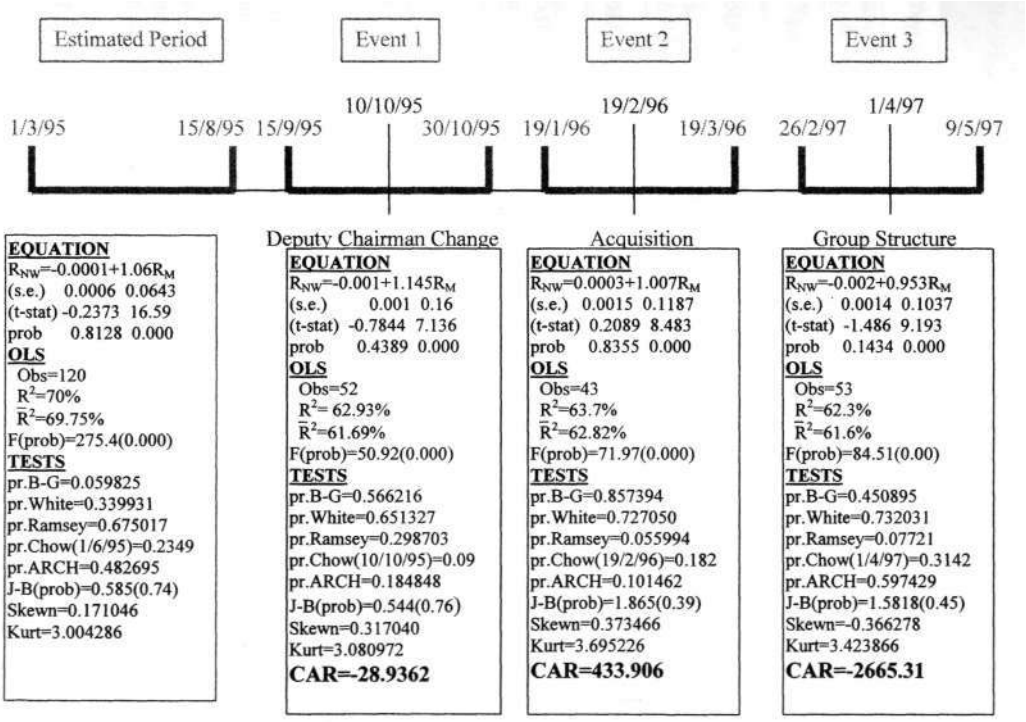


TABLE 6

Average Cumulative Abnormal Returns (CARs) distribution and statistical significance for the 'events'

Types of 'events' (1)	CARs* (2)	t (CARs) (3)
MERGERS	Negative -13688.8	65.07**
	Positive 575.55	15.31**
DISPOSALS	Negative -402.274	4.64**
	Positive (257.53< CARs >6842.192)	(18.62< t (CARs) >31.08)**
ACQUISITIONS	Positive 433.906	13.6**
GROUP STRUCTURE	Negative (-2665.31<CARs>-5642.39)	(44.32< t (CARs) >78.21)**
DEPUTY CHAIRMAN CHANGE	Negative (-28.93<CARs>-351.889)	(3,7< t (CARs) >42.31)**

Note
The Cumulative Abnormal Returns are in logs
** Statistical significant CARs at 5% confidence interval

Notes

1. Banks in order to strengthen their position in the international markets, they merge, acquire or dispose. Three of Norway's biggest banks, Christiana Bank, Fokus Bank and the state-owned Postbanken, agreed to merge to respond to growing competition among banks in Europe. The merged institution, will be Norway's largest bank. ING Group, a Dutch banking and financial-services firm, strengthened its position inside Europe's single-currency market by acquiring the 34.5% of Germany's BHF bank. Examples of such changes are written nearly every day in press.

2. For testing semi-strong form of efficiency in ASE with this method, see Tsangarakis 1993 and 1996.

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