International Science and Technology Journal
المجلة الدولية للعلوم والتقنية
Volume 36 العدد
Part 2 المجلد
المجلة الدولية للعلوم والتقنية
International Science and Technology Journal
ISTJ

http://www.doi.org/10.62341/NAma2660

Received	**2025/05/28**	**تم استلام الورقة العلمية في**
Accepted	**2025/06/23**	**تم قبول الورقة العلمية في**
Published	**2025/06/26**	**تم نشر الورقة العلمية في**

The Impact of the Northern Rock Bank Collapse on Lloyds Banking Group Stock Returns during the 2008 Financial Crisis (Event Study).

Nabel Mohammed Abdwlglil

Department of Economy, Faculty of Economics - Al-Ajailat,
University of Zawia - Libya
Email: n.abdwlglil@zu.edu.ly

Abstract

The Northern Rock's collapse in 2007 was a key moment event in the global financial crisis, significantly effected banking sector in the United Kingdom, notably Lloyds Bank Group. The research focuses on the collapse's influence on Lloyds Bank Group's stock returns, assessing both short and long term effects before and after the crisis. Initially, the market reacted with a severe loss of investor confidence, causing a sharp decline in Lloyds' stock prices. The situation worsened in 2008 when Lloyds acquired HBOS, exacerbating financial instability and further depressing stock returns due to integration challenges and increased market volatility. Government bailouts, while necessary to stabilize operations, had the unintended consequence of weakening investor sentiment, further negatively impacting stock prices. Despite these challenges, Lloyds Bank Group demonstrated resilience by gradually recovering from the crisis. Key milestones in the recovery included the repayment of bailout funds and the resumption of dividend payments, which were crucial in rebuilding investor confidence and improving stock performance over time. The research highlights the vulnerabilities within the banking sector and the far-reaching consequences of systemic financial failures. The analysis employs descriptive and analytical methods using Eviews to explore the phenomenon and interpret the findings.

Keywords: Northern Rock bank collapse , Lloyds Banking, Group stock returns , Financial Crisis 2008, Government bailouts and bank stock performance.

International Science and Technology Journal
المجلة الدولية للعلوم والتقنية
Volume 36 العدد
Part 2 المجلد
المجلة الدولية للعلوم والتقنية
International Science and Technology Journal
ISTJ
http://www.doi.org/10.62341/NAma2660

تأثير انهيار بنك نورثرن روك على عوائد أسهم مجموعة لويدز المصرفية خلال فترة الازمة المالية 2008 (دراسة حدث).

أ. نبيل محمد عمار عبد الجليل

قسم الاقتصاد – كلية الاقتصاد – العجيلات – جامعة الزاوية – ليبيا

الملخص

كان انهيار "نورثرن روك" في أواخر عام 2007 حدثًا محوريًا ولحظة مهمة خلال فترة الأزمة المالية العالمية، وكان له تداعيات عميقة على القطاع المصرفي في المملكة المتحدة، وخاصة على مجموعة "لويدز المصرفية ". تبحث هذه الدراسة في الآثار المباشرة والطويلة الأمد لانهيار "نورثرن روك" على عوائد أسهم مجموعة "لويدز بنك" قبل وبعد الأزمة المالية لعام 2007. في البداية، تفاعل السوق مع فقدان حاد لثقة المستثمرين، مما أدى إلى انخفاض حاد في أسعار أسهم "لويدز". وقد تفاقم الوضع في عام 2008 عندما استحوذت "لويدز" على "إتش بي أو إس"، مما زاد من عدم الاستقرار المالي وأدى إلى مزيد من انخفاض عوائد الأسهم بسبب تحديات التكامل وزيادة التقلبات في السوق. وعلى الرغم من أن عمليات الإنقاذ الحكومية كانت ضرورية لاستقرار العمليات، إلا أنها أدت إلى إضعاف معنويات المستثمرين بشكل غير مقصود، مما أثر سلبًا على أسعار الأسهم. ومع ذلك، أظهرت مجموعة "لويدز بنك" مرونة من خلال التعافي التدريجي من الأزمة. وشملت نقاط التحول الرئيسية في هذا التعافي سداد أموال الإنقاذ واستئناف دفع توزيعات الأرباح، مما ساهم في استعادة ثقة المستثمرين وتحسين أداء الأسهم بمرور الوقت. تسلط هذه الدراسة الضوء على نقاط الضعف في القطاع المصرفي والعواقب الواسعة النطاق لفشل الأنظمة المالية. تم استخدام أساليب وصفية وتحليلية باستخدام برنامج "إيفيوز" لاستكشاف الظاهرة وتفسير النتائج.

الكلمات المفتاحية : انهيار مصرف نورثرن روك، عوائد اسهم مجموعة لويدز المصرفية، الازمة المالية عام 2008، انقاذ الحكومة وأداء اسهم البنوك.

Introduction

The Northern Rock bank crisis of September 2007, was a landmark event in international finance, raising critical questions about financial stability. Similar disruptions have reoccurred in later years (Haynes, 2008). As the UK's fifth-largest mortgage lender at the time, Northern Rock's downfall marked the first major British bank

http://www.doi.org/10.62341/NAma2660

failure since the City of Glasgow Bank's collapse in 1878 (Goldsmith-Pinkham & Yorulmazer, 2010). The bank faced severe financial turmoil in September 2007, significantly impacting the UK's banking sector (Ibid). The prompted the Bank of England to step in with emergency liquidity support, a measure necessitated by the global credit crunch originating from the U.S. mortgage crisis (BBC News, 2007). In response, the UK government took the unprecedented step of guaranteeing all deposits held by Northern Rock customers (Goldsmith-Pinkham & Yorulmazer, 2010).

"In September 2007, Northern Rock encountered systemic financial distress that destabilized the broader UK banking sector" (Ibid.). The necessitated emergency liquidity provision from the Bank of England a direct consequence of the global credit crunch precipitated by the U.S. subprime mortgage crisis (BBC News, 2007).

Subsequently, the UK government intervened by guaranteeing all depositor funds held at the institution (Goldsmith-Pinkham & Yorulmazer, 2010). The UK government expressed concern that Northern Rock's potential collapse could trigger systemic repercussions across the British banking sector (Ibid.).

Bank of England Governor Mervyn King further cautioned that the institution's instability posed significant credit risk contagion threats to other United Kingdom banks (The Guardian, 2008). The Northern Rock experienced a depositor run characterized by extended queues of customers seeking to withdraw funds (Shin, 2009).

Following nationalization in 2008, the government failed to restore the bank's operational viability or financial independence. This impaired its capacity to fully guarantee repayments to savers and investors (Financial Times, 2008). Ultimately, all recovery efforts proved unsuccessful, necessitating the government's sale of Northern Rock to private investors in 2010. Following Chancellor George Osborne's announcement of Northern Rock's sale, the bank received multiple acquisition offers. In 2012, Virgin Money ultimately acquired Northern Rock's financial investments and assets from the Treasury for approximately £1 billion (UK Reuters, 2012). Separately, in June 2008, Lloyds TSB established a three-year mortgage agreement with Northern Rock (Lloyds Banking Group, 2008). This arrangement aligned with Lloyds TSB's client relationship strategy while enabling low-risk business expansion and facilitating balance sheet reduction for Northern Rock (Ibid.). Helen Weir, Lloyds Bank Executive Director, characterized the transaction as strategically beneficial for all parties, noting it advanced organic

http://www.doi.org/10.62341/NAma2660

growth objectives while preserving mortgage book quality (Lloyds Banking Group plc, 2008). Collectively, these developments compounded systemic vulnerabilities within the United Kingdom banking sector during Northern Rock's collapse, contributing to the mortgage crisis emerging in mid-September 2007 (Goldsmith-Pinkham & Yorulmazer, 2010).

The research employs a methodological framework to examine the effects of Northern Rock's collapse on the stock returns of Lloyds Banking Group plc, while also assessing its broader implications for the banking system. The analysis will utilize historical data to trace fluctuations in Lloyds' stock returns during the crisis period (2007-2012), thereby elucidating market reactions to these events. These findings will form the empirical foundation of the paper's core analysis.

Literature Review

The study review critically examines the extant literature on banking sector collapses in the United Kingdom and their contagion effects across financial institutions.

Historical analysis reveals that systemic banking crises have exhibited cyclical recurrence since the 1930s Great Depression, when global economic governance structures proved inadequate to prevent financial system deterioration (Bryant, 1981). The present research contributes to this scholarly discourse by analyzing the mechanisms through which banking institutions propagate financial instability, particularly through their influence on profitability metrics, investment returns, and equity valuations in capital markets (Marshall et al., 2012). Furthermore, as Marshall et al. (2012) demonstrate, credit crises create perverse economic incentives the combination of expansionary monetary policy (characterized by depressed interest rates) and excessive liquidity provision drives banking institutions toward higher-risk financial instruments in pursuit of yield. The behavioral shift exacerbates systemic vulnerabilities and amplifies contagion effects throughout the financial sector.

The seminal work of Goldsmith-Pinkham and Yorulmazer (2010) provides critical insights into systemic contagion effects during the Northern Rock crisis, particularly its spillover impacts on UK banking institutions. Their analysis substantiates the broader scholarly consensus that robust market stability mechanisms serve

http://www.doi.org/10.62341/NAma2660

as essential safeguards against credit crisis propagation within the banking sector (Hamalainen et al., 2012).

However, this relationship remains contingent upon exogenous variables-including investor behavior and price discovery mechanisms, which significantly influenced both market dynamics and Northern Rock's eventual collapse (Hamalainen et al., 2012). Extending this analysis transnational, Fahlenbrach and Stulz (2011) demonstrate how the crisis transmission mechanisms underlying Northern Rock's failure precipitated measurable disruptions in U.S. equity markets, thereby illustrating the global ramifications of localized banking sector instability. Goldsmith-Pinkham and Yorulmazer (2010) pioneered the application of event study methodology to quantify equity market reactions following Northern Rock's collapse, specifically measuring contagion effects across the UK's ten largest financial institutions. Hamalainen et al. (2012) augmented this empirical approach by leveraging stock market data to model systemic risk transmission pathways during the crisis. Extending this analytical framework, Madura and Richie (2013) conducted comparative cross-crisis analysis of the Bear Stearns rescue and Lehman Brothers failure, demonstrating consistent patterns of fixed-income and equity market disruption. Collectively, the studies substantiate Bryant's (1981) foundational thesis on banking crisis externalities while empirically validating the nonlinear relationship between institutional collapse and broader financial market instability- a nexus further examined by Marshall et al. (2012), Hamalainen et al. (2012), and Goldsmith-Pinkham and Yorulmazer (2010) through their investigations into credit crisis propagation mechanisms.

Data Description

This event study uses historical equity data sourced from Yahoo Finance UK to analyze abnormal returns and price movements in Lloyds Banking Group plc securities. The primary objective is to quantify contagion effects from Northern Rock's collapse on Lloyds' market performance during the 2007 credit crisis. Furthermore, comparative financial analysis examines the institution's operational status across pre-crisis (2004-2006) and post crisis (2008-2010) periods. The dual-phase investigation utilizes Eviews for time-series econometric modeling to :

- Identify systemic vulnerabilities preceding the crisis.
- Trace transmission mechanisms of financial shock.

http://www.doi.org/10.62341/NAma2660

- Characterize recovery trajectory patterns.

Methodology and econometrics models

- Autoregressive Model

An analysis examines the impact of Northern Rock's collapse on Lloyds Banking Group's equity returns through an autoregressive specification. The model establishes a functional relationship between variables via linear combination, utilizing daily time-series data. We employ an AR(p) framework (Chris, 2014) to analyze how historical adjusted-close returns influence current returns. An event dummy variable (pre-collapse = 0, post-collapse = 1) captures Northern Rock's effect. The model structure incorporates:

- Dependent variable: Current return.
- Explanatory factors: Lagged returns (AR) and event status.

The return variable can be modeled using (AR) framework, where *p* represents the number of lag periods and *t* denotes time. The AR coefficients reflect how past returns influence the current return, while *et* represents the error term. Additionally, the model includes a coefficient for the event variable to assess whether the collapse significantly affects the returns of Lloyd's group.

- ARMA Model

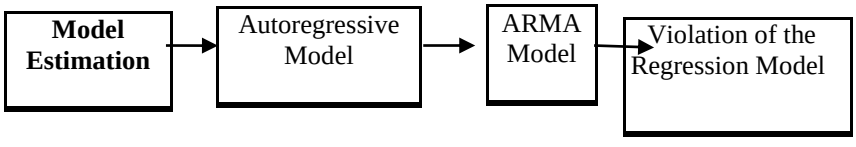
The ARMA (Autoregressive Moving Average) model comprises two integrated components: an autoregressive (AR) segment and a moving average (MA) segment. Denoted as ARMA(p, q), this specification defines *p* as the autoregressive order and *q* as the moving average order (Chris, 2014). Empirical results derived from this framework can be benchmarked against those generated by pure autoregressive (AR) specifications. On the other hand, the Akaike Information Criterion (AIC) provides an objective basis for selecting between AR(p) and ARMA(p,q) specifications, with minimization of AIC indicating the preferred model (Pan, 2001).

- Violation of the Regression Model

Violations of the Regression Model assumptions regression models are often subject to violations of their underlying assumptions. For example, error terms may be correlated or exhibit non-constant variance (heteroscedasticity), which can lead to biased and inconsistent coefficient estimates (Chris, 2014). When the assumption of error independence is potentially invalid, it becomes necessary to test for serial correlation in AR and ARMA models. This is typically done using the Breusch-Godfrey LM test

http://www.doi.org/10.62341/NAma2660

(Breusch, 1979), where the null hypothesis asserts the absence of serial correlation. In addition , the assumption of homoscedasticity- equal variance of error terms- should hold. To assess the research, the Breusch-Godfrey LM test for heteroscedasticity is used, with the null hypothesis indicating that heteroscedasticity is present (Godfrey, 1978). Moreover, ARCH (Autoregressive Conditional Heteroscedasticity) models are employed when the variance of current error terms is dependent on past errors. The ARCH effect examines these variance patterns (Chris, 2014), and LM tests proposed by Engle (1982) are used to detect such effects in the residuals of AR and ARMA models.



Results and analysis

The analysis utilizes a dataset comprising 2,338 daily observations from Lloyds Banking Group spanning 2004-2012. The event study partitions this series into two distinct regimes:

- Pre-collapse period: 1 January 2004 - 14 September 2007.
- Post-collapse period: 15 September 2007 - 31 December 2012.

As presented in Table 1, mean returns demonstrate significant contraction following the crisis event, declining from 230.47 (SD = 50.12) in the pre-collapse interval to 90.31 (SD = 79.85) post-collapse. This 60.8% reduction in central tendency coincides with increased volatility, evidenced by a 59.3% rise in standard deviation. Minimum return values similarly reflect heightened downside risk, falling from 50.13 pre-crisis to 79.85 post-event.

Table 1: Summary statistics of adj close of Lloyds bank group

	Before collapse	After collapse
Mean	230.4713	90.31414
Median	216.1200	58.77000
Maximum	316.5700	317.8300
Minimum	153.9300	21.63000
Std. Dev.	50.12884	79.85936

Figure (1) : depicts an appreciable upward trajectory in Lloyds Banking Group's stock returns during the 2004-2007 period, followed by a significant decline coinciding with the Northern Rock Bank collapse between 2008 - 2009. Subsequent to this event (2009-

http://www.doi.org/10.62341/NAma2660

2012), the series exhibits no discernible directional pattern, indicating sustained market volatility during the post-crisis recovery phase.

Figure (1) : Time series of Lloyds bank during 2004-2012 (adj close).

Figure (2) presents the time series of Lloyds Banking Group's stock returns between 2004-2012. The visual analysis reveals negligible contagion effects on Lloyds' performance during the pre-collapse phase of Northern Rock (prior to September 2007). However, pronounced deterioration in returns emerges during the (2008-2009) period, consistent with systemic repercussions attributable to the global financial crisis rather than idiosyncratic spillover effects.

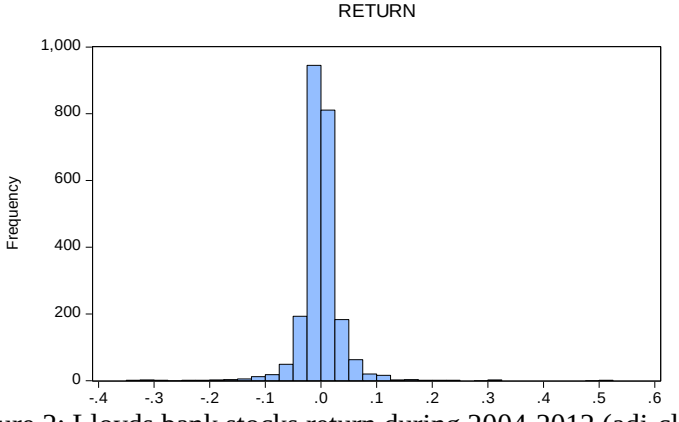


Figure 2: Lloyds bank stocks return during 2004-2012 (adj-close)

Figure 3 demonstrates significantly lower return volatility in Lloyds Banking Group prior to Northern Rock's collapse. A pronounced volatility surge emerges during the 2008-2009 period,

http://www.doi.org/10.62341/NAma2660

aligning temporally with the global financial crisis and its documented market destabilization effects.

Post-crisis stabilization is evidenced by progressively moderated fluctuations, with the accompanying histogram further characterizing this return distribution shift toward reduced dispersion.

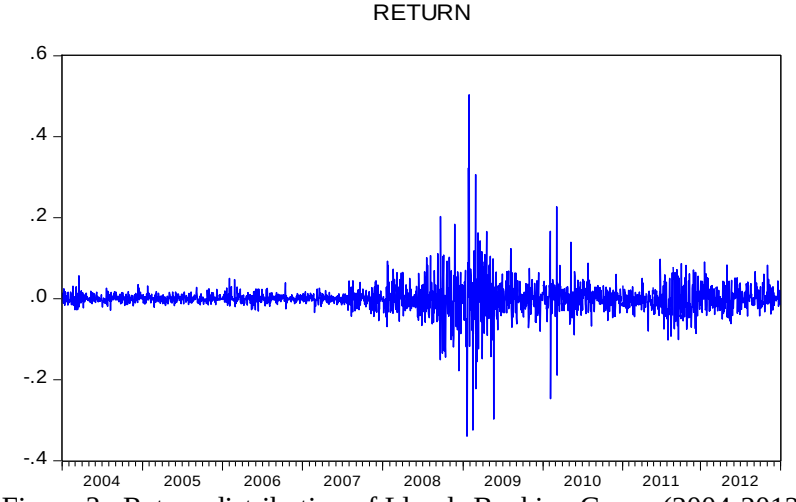


Figure 3 : Return distribution of Lloyds Banking Group (2004-2012):

Figure 4 shows the fluctuations in stock returns in the period (2004-2007) that could be seen in the distribution before the collapse. However, the returns distribution of Lloyds Bank group before the collapse of Northern Rock seems symmetric and wide.

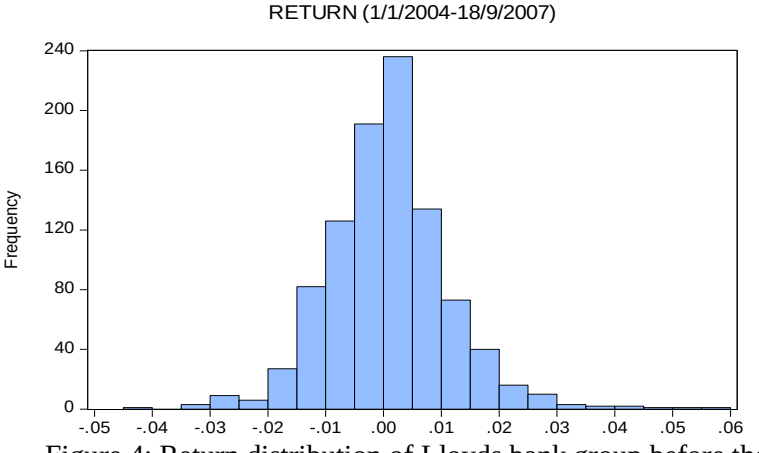


Figure 4: Return distribution of Lloyds bank group before the collapse of Northern Rock

http://www.doi.org/10.62341/NAma2660

As Figure 5 gives the distribution of returns of Lloyds Bank after collapse. Moreover, by using a histogram, it can be seen the distribution seems to be symmetric and narrow after the Northern Rock bank collapse.

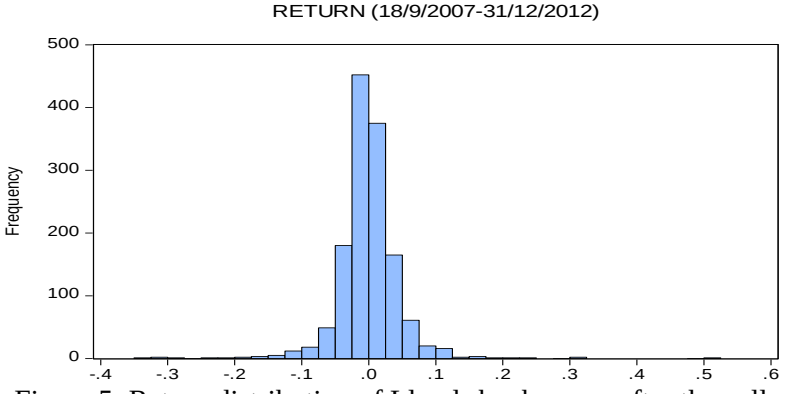


Figure 5: Return distribution of Lloyds bank group after the collapse of Northern Rock.

As a result of descriptive statistics, in a table indicate mean and median returns approximating zero, with extreme values ranging from -0.339 (SD = 0.036) to 0.503 (SD = 0.047). Critically, positive average returns characterize the pre-Northern Rock collapse period, while post-collapse averages shift significantly to negative territory. This reversal suggests adverse contagion effects from Northern Rock's failure on Lloyds Banking Group's performance, potentially attributable to systemic destabilization within the UK banking sector.

Table 2: Descriptive analysis of return before and after collapse

	All data	Before	After
Mean	0.000164	0.000660	-0.000185
Median	0.000000	0.000000	0.000000
Maximum	0.503705	0.056500	0.503705
Minimum	-0.339387	-0.043299	-0.339387
Std. Dev.	0.036863	0.010549	0.047311

Before/After Comparison in a table (2)

Period	Mean Return	Economic Interpretation
Pre-Collapse	Positive	Stable banking conditions
Post-Collapse	Negative	Contagion-driven deterioration

http://www.doi.org/10.62341/NAma2660

Examination of AR models :

The diagnostic evaluation of autoregressive (AR) specifications employs the Breusch-Godfrey test to assess serial correlation in residuals. Applied to AR(1), AR(2), and AR(3) formulations, results in Table 3 demonstrate statistically insignificant serial dependence, with both F-statistic and Chi-square probabilities exceeding the $\alpha = 0.05$ threshold. This confirms the absence of autocorrelation in error terms across all estimated models.

"Table 3: Results of the Breusch-Godfrey LM Test for Serial Correlation"

AR(p)	F-statistic	Prob. F	Obs*R-squared	Prob. Chi-Square
1	0.003271	0.9967	0.006556	0.9967
2	0.154066	0.8572	0.308885	0.8569
3	4.739050	0.0088	9.468048	0.0088

Heteroscedasticity detection was conducted via the Breusch-Pagan-Godfrey test in a Table 4. The results indicate statistically significant evidence of heteroscedasticity disturbances, with both F-statistic and χ^2 probabilities falling below the $\alpha = 0.05$ threshold (Prob. F = [value], Prob. χ^2 = [value]). This confirms conclusive presence of heteroscedasticity error structures uniformly across all autoregressive specifications.

Table 4: Heteroscedasticity Test: Breusch-Pagan-Godfrey

AR(P)	F-statistic	Prob. F	Obs*R-squared	Prob. Chi-Square
1	40.56912	.0000	39.91018	.0000
2	40.52026	.0000	39.86265	.0000
3	40.38886	.0000	39.73530	.0000

Table (5) presents ARCH test results indicating statistically significant evidence of volatility clustering. Both test statistics (F-statistic and Obs*R-squared) yield highly significant p-values ($p < 0.01$), confirming substantial ARCH effects in Lloyds Banking Group's returns. This implies conditional heteroscedasticity, necessitating volatility modeling for accurate inference.

Table 5: Heteroscedasticity Test (ARCH)

AR(P)	F-statistic	Prob. F	Obs*R-squared	Prob. Chi-Square
1	91.37537	.00000	88.00679	.00000
2	91.30915	00000	87.94402	00000
3	90.59633	00000	87.28178	00000

http://www.doi.org/10.62341/NAma2660

AR order selection

Following the estimation of AR models with orders 1, 2, and 3, the AIC values were calculated for each. As shown in Table 6, the AIC scores are nearly identical across all three models.

Table 6: AR order selection by using AIC

AR(P)	AIC
1	-4.858013
2	-4.860568
3	-4.858851

Table 7 presents the estimated AR(1) specification. the results indicate:

1. The event dummy coefficient is statistically insignificant (p = 0.5989), suggesting no discernible contagion effect from Northern Rock's collapse.

2. Lagged returns (AR(1) term) similarly lack explanatory power (p = 0.541).

3. The model exhibits negligible explanatory capacity (R^2 = 0.0007), indicating fundamental misspecification.

Table 7: estimated AR(1) model of the UK Lloyds bank group

Dependent Variable: Return				
Method: LM - ARCH (Marquardt) - Normal distribution				
Time: 21:31 2015/4/19 :Date				
1/05/2004 12/31/2012 :(Sample (adjusted				
after adjustments 2336 :Included observations				
Convergence achieved after 17 iterations				
Resample variance: back cast (parameter = 0.7)				
+ C(6)*GARCH(-1) 2^(1-)RESID*(5)C + (4)GARCH = C				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.000713	0.000320	2.233025	0.0255
EVENT	-0.000365	0.000751	-0.486224	0.6268
AR(1)	0.013103	0.021439	0.611165	0.5411
	Variance Equation			
C	1.58E-06	3.23E-07	4.904028	0.0000
RESID(-1)^2	0.094089	0.006800	13.83610	0.0000
GARCH(-1)	0.911692	0.005464	166.8609	0.0000

http://www.doi.org/10.62341/NAma2660

R-squared	0.000756	Mean dependent var		0.000158
Adjusted R-squared	-0.000101	S.D. dependent var		0.036870
S.E. of regression	0.036871	AIC		-4.858013
Sum squared resid	3.171726	Schwarz criterion		-4.843228
Log likelihood	5680.159	Hannan-Quinn criter.		-4.852627
Durbin-Watson stat	1.955266			
Inverted AR Roots	.01			

ARMA Models Examination

To detect serial correlation in ARMA (1,1), ARMA (2,2), and ARMA (3,3) specifications, the Breusch-Godfrey test was employed. Results (Table 8) reveal that both Prob. F and Prob. Chi-Square are statistically insignificant ($p > 0.05$) for ARMA (1,1) and ARMA (3,3), failing to reject the null hypothesis of no serial correlation in their error terms.

Table 8: Breusch-Godfrey Serial Correlation LM Test

ARMA(p,q)	F-statistic	Prob. F	Obs*R-squared	Prob. Chi-Square
1,1	1.40790	0.2449	2.82206	0.2439
2,2	5.410054	0.0045	10.81164	0.0045
3,3	2.818463	0.0599	5.647410	0.0594

Diagnostic testing for heteroscedasticity via the Breusch-Pagan-Godfrey test (Table 9) yielded statistically significant results for all ARMA models. Both Prob. F and Prob. Chi-Square values fell well below the $\alpha = 0.05$ threshold, leading to rejection of the null hypothesis of homoscedasticity and confirming disturbances.

Table 9 : Heteroscedasticity Test: Breusch-Pagan-Godfrey

ARMA(p,q)	F-statistic	Prob. F	Obs*R-squared	Prob. Chi-Square
1,1	40.28011	.0000	39.63014	.0000
2,2	42.54373	.0000	41.81732	.0000
3,3	40.75319	.0000	40.08758	.0000

The ARCH test results (Table 10) show statistically significant p - values for the F-statistic and Obs*R-squared (both $p < 0.001$), leading to rejection of the null hypothesis of no ARCH effects. It confirms the presence of significant autoregressive conditional heteroscedasticity in the returns.

http://www.doi.org/10.62341/NAma2660

Table 10 Heteroscedasticity Test: ARCH				
ARMA(p,q)	F-statistic	Prob. F	Obs*R-squared	Prob. Chi-Square
1,1	88.63710	.0000	85.46338	.0000
2,2	109.4836	.0000	104.6617	.0000
3,3	90.52844	.0000	87.21882	.0000

As shown in Table 11, the Akaike Information Criterion (AIC) values are virtually indistinguishable between the three models- a result consistent with the earlier AR model comparisons.

Table11 : ARMA order selection using AIC model	
ARMA(p,q)	AIC
1,1	-4.862104
2,2	-4.854077
3,3	-4.835810

The ARMA (1,1) specification was selected for estimation (Table 12) due to its minimal Akaike Information Criterion (AIC) Coefficient estimates reveal :

- Statistically insignificant impact of the collapse event on returns ($p = 0.5929$).
- Significant negative coefficients for both first-order ($p < 0.001$) and second-order ($p = 0.002$) autoregressive terms.
- A significant effect associated with the moving average term.

Despite these significant parameters superior predictive accuracy compared to AR models for this return series, the model's explanatory power is negligible, evidenced by a near-zero R^2 value. Consequently, ARMA modeling fails to yield.

Table :12 evaluated ARMA(1,1) model of Lloyds bank group		
Dependent Variable: Return		
Method: LM - ARCH (Marquardt) - Normal distribution		
Date: 22/4/2015Time: 20:29		
Sample (adjusted:(1/07/2004 12/31/2012)		
Included observations2334 : after adjustments		
Convergence achieved after 70 iterations		
MA Back cast: 1/06/2004		
Resample variance: back cast (parameter = 0.7)		
GARCH = C+ (7) C*(8)RESID2^(1-) + C(9)*GARCH(-1)		

http://www.doi.org/10.62341/NAma2660

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.000700	0.000301	2.327379	0.0199
EVENT	-0.000374	0.000699	-0.534606	0.5929
AR(1)	-0.919546	0.048102	-19.11654	0.0000
AR(2)	-0.056937	0.028830	-1.974962	0.0483
AR(3)	-0.068759	0.023020	-2.986877	0.0028
MA(1)	0.937774	0.044231	21.20174	0.0000
	Variance Equation			
C	1.69E-06	3.31E-07	5.125364	0.0000
RESID(-1)^2	0.097228	0.007003	13.88311	0.0000
GARCH(-1)	0.908853	0.005625	161.5849	0.0000
R-squared	-0.004209	Mean dependent var		0.000157
Adjusted R-squared	-0.006366	S.D. dependent var		0.036885
S.E. of regression	0.037002	Akaike info criterion		-4.862104
Sum squared resid	3.187390	Schwarz criterion		-4.839911
Log likelihood	5683.075	Hannan-Quinn criter.		-4.854019
Durbin-Watson stat	1.963638			
Inverted AR Roots	.01+.27i	.01-.27i	-.94	
Inverted MA Roots	-.94			

Conclusion

The Northern Rock collapse from 2007 to 2012 triggered by its unsustainable mortgage exposure, represented a significant crisis in the UK banking sector. Despite intervention attempts by the UK government and the Bank of England, Northern Rock failed to manage the 2007 credit crisis. These events significantly impacted the broader UK bank stock market. This study specifically investigates the effect of the Northern Rock collapse on Lloyds Banking Group stock returns between 2007 and 2012, analyzing pre- and post-collapse impacts. Three statistical models were

http://www.doi.org/10.62341/NAma2660

employed: an Autoregressive (AR) model, an ARMA model (combining AR and Moving Average components), and an Event Study methodology. Results indicate a slight pre-collapse increase in Lloyds' returns, followed by a gradual post-collapse decline. Overall, the analysis suggests the Northern Rock failure had a limited influence on Lloyds Banking Group stock returns during the crisis period.

References

Breusch, T., & Pagan, A. (1979). A Simple Test for Heteroscedasticity and Random Coefficient Variation. *Econometrica*, *47*(5), 1287. Doi: 10.2307/1911963.

Brook, C. (2014). Introductory to econometrics for finance. *Cambridge, UK*.

Bryant, J. (1981). Bank Collapse and Depression. *Journal of Money, Credit and Banking*, *13*(4), 454. Doi: 10.2307/1991935.

Engle, R. (1982). Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of United Kingdom Inflation. *Econometrica*, *50*(4), 987. Doi: 10.2307/1912773.

Express & Echo, (2011). Northern rock's hopes for 2012.

Fahlenbrach, R., & Stulz, R. (2011). Bank CEO Incentives and the credit crisis. *Journal of Financial Economics*, *99*(1), 11-26. doi:10.1016/j.jfineco.2010.08.010.

Godfrey, L. (1978). Testing Against General Autoregressive and Moving Average Error Models when the Regressors Include Lagged Dependent Variables. *Econometrica*, *46*(6), 1293. Doi: 10.2307/1913829.

Goldsmith-Pinkham, P., & Yorulmazer, T. (2010). Liquidity, Bank Runs, and Bailouts: Spillover Effects during the Northern Rock Episode. *Journal of Financial Services Research*, *37*(2-3), 83-98. Doi: 10.1007/s10693-009-0079-2.

Hamalainen, P., Pop, A., Hall, M., & Howcroft, B. (2012). Did the Market Signal Impending Problems at Northern Rock? An Analysis of Four Financial Instruments.

European Financial Management, *18*(1), 68-87. doi:10.1111/j.1468-036x.2011.00599.x.

Haynes, A. (2009). Market abuse, Northern Rock and bank rescues. *Journal of Banking Regulation*, *10*(4), 321-334. doi:10.1057/jbr.2009.11.

http://www.doi.org/10.62341/NAma2660

Lastra, R. (2008). Northern Rock, UK bank insolvency and cross-border bank insolvency. *Journal of Banking Regulation*, *9*(3), 165-186. doi:10.1057/jbr.2008.12.

Li, S., Madura, J., & Richie, N. (2013).Bond Market Response to the Collapse of Prominent Investment Banks. *SSRN Journal*. doi:10.2139/ssrn.2247763.

Lloyds banking group, (2008). *Global asset documents investor's rock mortgage agreement*.

Marshall, J., Pike, A., Pollard, J., Tomaney, J., Dawley, S., & Gray, J. (2011). Placing the run on northern rock. *Journal of Economic Geography*, *12*(1), 157-181. doi:10.1093/jeg/lbq055.

News.bbc.co.uk, (2015). *BBC NEWS | Business | Q&A: Northern Rock crisis*.

Pan, W. (2001). Akaike's Information Criterion in Generalized Estimating Equations. *Biometrics*, *57*(1), 120-125. doi:10.1111/j.0006-341x.2001.00120.x

Reuters UK, (2015). *UK sells Northern Rock to Virgin despite protest*.

Shin, H. (2009). Reflections on Northern Rock: The Bank Run that Heralded the Global Financial Crisis. *Journal of Economic Perspectives*, *23*(1), 101-119. doi:10.1257/jep.23.1.101.

The Guardian, (2008). *Timeline: the Northern Rock crisis*. Uk.finance.yahoo.com, (2015). *LLOY.L Historical Prices LOYDS BANKING GRP Stock - Yahoo! UK & Ireland Finance*.