Short Selling Activity in Financial Stocks and the SEC July 15th Emergency Order

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Executive Summary

Issue

On July 15th, 2008 the Securities Exchange Commission issued an Emergency Order (EO) to "*enhance investor protection against naked short selling in the securities of Fannie Mae, Freddie Mac, and primary dealers at commercial and investment banks.*"[1] The order requires that anyone effecting a short sale in the securities involved should arrange beforehand to borrow the securities and deliver them at settlement. The order took effect at 12:01 a.m. ET on Monday, July 21, and would terminate at 11:59 pm ET on July 29, 2008, although it was later extended until August 15th, 2008.

The EO dealt primarily with the stocks of the following financial institutions: BNP Paribas Securities Corp., Bank of America Corporation, Barclays PLC, Citigroup Inc., Credit Suisse Group, Daiwa Securities Group Inc., Deutsche Bank Group AG, Allianz SE, Goldman Sachs Group Inc, Royal Bank ADS, HSBC Holdings PLC ADS, J. P. Morgan Chase & Co., Lehman Brothers Holdings Inc., Merrill Lynch & Co. Inc., Mizuho Financial Group Inc., Morgan Stanley, UBS AG, Freddie Mac, and Fannie Mae. We denote this group the "G19 stocks" henceforth.

Objectives

The objectives of the current report are:

1. To track the performance of the 19 stocks covered under the EO prior to July 21st, 2008.
2. To construct a sample of comparable stocks, both domestic and international, not affected by the EO, and analyze their performance in relation to the G19 stocks.
3. To analyze the short positions on these stocks over the past months, as well as during the EO period, in order to determine:
    a. Whether the short selling activities in the G19 stocks are significantly higher than in comparable stocks, and

[1] SEC Release 2008-143

b. Whether the short selling activities in the G19 stocks have had a significant impact on their stock prices.

4. To analyze measures of market quality for the sub-sample of G19 stocks, such as bid-ask spreads, market volatility and trading range, in order to determine:
    a. Whether the quality of the market for these stocks had deteriorated by July 15th 2008, in such a way that it justified an intervention by the regulator, and
    b. Whether the EO has had, since July 21st, and as of August 8, 2008, any significant effect on the market quality of the G19 stocks.
5. To analyze the pricing efficiency of the market for the G19 stocks in relation to the comparable sample, both before and after the EO, in order to determine:
    a. Whether the efficiency of the market had deteriorated by July 15th 2008, in such away that it justified an intervention by the regulator only in the G19 stocks, and
    b. Whether the efficiency of the overall market has improved or worsened after July 21st, 2008.

Preliminary Findings

The study is conducted by comparing stock returns, firm fundamentals, measures of market quality, and pricing efficiency of the G19 to a matching sample of financial stocks from the U.S. and abroad, all listed in U.S. stock exchanges. The control sample of US financial institutions includes 59 companies, and the control sample of non-US financial institutions includes 73 companies. We collect information from several sources and for the period July 1st, 2006 - August 8th, 2008. Our findings can be summarized as follows:

1. **The performance of the G19 stocks is significantly worse in the period January 2008 / July 2008 than for comparable stocks**. While the G19 stocks have lost on average 43 percent in value, similar US financial institutions have lost 35 percent, and similar non-US financial institutions have lost 21 percent in value. **The accounting performance of G19 firms is, however, not worse** than comparable firms, as of January 1st 2008. For example while

the EBIT margin if G19 stocks is 39 percent on average, it is 12 percent and 29 percent respectively for the two comparable samples.

2. **The short selling activities in the G19 stocks have not been significantly higher than for comparable stocks between 2006 and 2008**. While the relative short sales (Number of Shares Shorted relative to Daily Trading Volume) is 12 percent on average for G19 stocks in 2008 (January 1st to July 15th), it is 13 percent on average for comparable US Financial Institutions.[2] The average Days-To-Cover for G19 stocks is 1.72 days in 2008, and 3.33 days for comparable US Financial Stocks.[3]
3. **While short selling has increased overall, short selling activities in the G19 stocks have not increased significantly more than in comparable US Financial Stocks**. Short interest has increased 127 percent and 122 percent for G19 and comparable US Financial Stocks respectively, between 2007 and 2008. Other measures of shorting activities yield a mixed and non-conclusive picture, as short-sales ratios are driven by a dramatic increase in trading volume over the past months.
4. Controlling for firm and market characteristics, **all measures of shorting activity are indeed lower for G19 stocks than for comparable US Financial Stocks, but higher than for comparable non-US Financial Stocks**.[4] Between July 2006 and July 15th 2008, Days-to-Cover are one day lower for G19 stocks than for comparable financial stocks; relative short sales (Shorted Shares to Trading Volume) ratio is 0.5 percent lower than for comparable firms; Shorted Shares to Float is 0.7 percent lower. All these results are statistically significant.
5. We find that firms' issuance activity fosters shorting activity, and in particular the **issuance of convertible bonds**. Convertible bonds are naturally covered by short sales of the underlying firm's stock. We provide two important results. Issuance of convertible bonds has been relatively more frequent for G19 stocks than for the sample of comparable firms. In the sample period we have identified twelve issues of convertible securities. Six of them correspond to firms in the G19 group[5], and the rest to other US Financial Institutions.[6] However the ratio of G19 firms to comparable firms is 1 to 3. We also find that convertible bond issuance has been a significant

[2] The difference is not statistically significant
[3] The difference is significant at the one-percent level
[4] Both results are statistically significant
[5] They are BAC, C twice, FNM, LEH, and MER.
[6] They are ABK, MTG, KEY, AIG, and twice NCC.

determinant of shorting activity. In the average firm, a convertible bond issue equivalent to 10 percent of market capitalization induces short sales of 5 million shares in the following 60 days.[7]

6. There is clear evidence that **some firms outside the G19 group have been the subject of heavy shorting activity over the sample period**. For the top-19 companies in the sample of US Financial stocks ranked by Days-to-Cover, the average Days-to-Cover number is 4.93, compared to 1.7 for the G19 stocks. These top-19 stocks include ABK, BBT, BEN, CMA, and COF. We find similar results for other measures of shorting activity A large and well-known company like Washington Mutual displays average Days-to-Cover ratio of 3.43 in 2008. That is, while short sale volume is large and has increased significantly for the G19 stocks, overall trading volume is large and has increased even further for the same stocks.
7. Although the performance of the G19 stocks has been significantly worse than for comparable firms, **the negative returns of G19 stocks cannot be attributed to short selling activities**. First because, as point 4 above states, an analysis of measures of shorting activity suggests that non-G19 stocks have been shorted more heavily both in 2007 and 2008. Second, because our regression analyses show an insignificant effect of measures of shorting activity on weekly stock returns, once we control for firm and market characteristics. In other words, **after controlling for short sales, the performance of G19 stocks is still worse than for comparable firms**.
8. We use several measures of market quality, following the academic literature. Specifically, we compute four measures of daily price volatility: the open-to-close volatility, and the close-to-close[8] volatility, as well as the positive and the negative semi-variances. We also compute three measures of market liquidity: quoted spread, relative quoted spread[9], and trade price range.[10] Overall, **we find that the market quality of the G19 stocks is significantly worse on most measures than for comparable US financial stocks before July 15th 2008**, but significantly better than for comparable non-US financial stocks.
9. **The lower market quality of the G19 stocks is not caused by short-selling activities**. Our regression analyses show that, after controlling for short-

[7] This result is statistically significant at the one-percent level.
[8] That is, the volatility of returns computed from previous day close to current day close
[9] Quoted spread relative to the bid-ask mid-point.
[10] The difference between the highest and the lowest price of the day

sales measures and stock and market characteristics, the indicators of market quality are still significantly worse for G19 stocks.

10. Specifically addressing the impact of the EO, our study shows that after July **21st, the G19 stocks have suffered a significant reduction in intra-day return volatility and an increase in spreads, which suggests a deterioration of market quality**. For example, from the pre-EO period to the post-EO period, relative quoted spreads for G19 stocks have increased from 18 percent to 48 percent, but they have increased only from 11 percent to 29 percent for comparable US financial stocks. There has been no significant change in the relative quoted spreads for non-US financial institutions. Regression analyses confirm a significant reduction in intraday volatility and increased spreads for the G19 stocks after July 21st.
11. We analyze the impact of the EO on the efficiency of markets. To that end, we follow Bris, Goetzmann, and Zhu ("Efficiency and the Bear: Short Sales and Markets Around the World," Journal of Finance 2007) and measure market efficiency at the individual stock level by computing the co-movement of individual stock returns and the market ("R-squared" measure). We also measure the cross-autocorrelation between previous-day market returns and stock returns. In more efficient markets, individual stock returns co-move less with the market, and are less correlated with past market returns as information is impounded into prices immediately. Applying this technique to the sample of financial stocks shows that **overall market efficiency has declined overall after the EO has become effective**. Additionally, the efficiency of G19 stocks has deteriorated more than the efficiency of comparable US Financial stocks. The downside co-movement measure—which measures how stocks can react to market negative news—has increased 27 percent for the former group and only 0.75 percent for the latter. Downside Cross-autocorrelation has turned positive, while it has dropped from -1.79 percent to -5.84 percent in comparable US stocks.

MAIN ANALYSIS

Sample construction and data sources

We start by constructing a matching sample of financial firms similar to the stocks in G19. To that end, we use the Datastream industry constituent list corresponding to "Financial Firms". These firms constitute the sample of "US Financial Firms" throughout the report, which includes 59 companies. Similarly, we identify, among the list of foreign public companies listed in US stock exchanges, all the financial firms. These firms constitute the sample of "non-US Financial Firms" which includes 73 firms. Non-US firms include type I, II and III ADR listings, as well as direct listings in either NYSE or Nasdaq.

Our main source of data for firm characteristics is Datastream / Worldscope. For each firm in the sample, we obtain detailed price information including: opening, closing, minimum and maximum prices of the day; trading volume; number of shares outstanding[11]; and return index inclusive of dividends. We additionally obtain daily returns for the Datastream US Market Index. We also obtain accounting information for year-ends 2007 and 2008 for all firms with data available, including the percent of institutional and insider ownership.

[INSERT TABLE I HERE]

Table I describes the characteristics of the three sub-samples in terms of stock returns, profitability and size as of December 2007. We first show that the market performance of the G19 stocks has been significantly worse than their peers. The year-to-date stock returns for G19 stocks, US Financial Firms, and non-US Financial Firms are respectively -42.78 percent, -34.76 percent, and -20.87 percent. G19 firms are also larger (Total Assets of $1.12 trillion in median vs. $0.07 and $0.13 respectively), both in books and in market value. G19 firms display slightly higher margins, but slightly lower return on asset ratios, so we cannot conclude that their performance has not been significantly worse.

[11] The number of shares outstanding corresponds to all markets where the company is listed, which is relevant for non-US firms

[INSERT TABLE II HERE]

Table II lists the firms included in each sample. When the firm is listed in several exchanges, we select the main one as determined by Datastream.

As we focus on short sales, we collect detailed information on the short selling activities affecting the stocks in our sample. We obtain trade-by-trade information from NYXdata on all short transactions of NYSE firms in our sample. This data includes time and execution date of the transaction, volume, and price. NYSE data is available from January 2007 until August 8th, 2008.

Additionally, we search the Nasdaq public data server and other public sources and collect information on Short Interest and Days-to-Cover.[12] This data is reported regularly on certain release dates, and we assign to each day in our sample the latest observation available, until a new one is reported. This data starts in June 2006 in our analysis. Unfortunately, non-transaction NYSE data is not available beyond July 15th, 2008, so a deep analysis of certain measures of short sale activity cannot be studied after the publication of the EO.

Finally, we use Thomson-One Banker to get detailed information on convertible issues by firms in our sample. We first download all the available issues of convertible instruments by US-listed financial firms between January 2006 and July 2008. We find 86 issues which amount to $73.4 billion of principal. Out of these,[13] twelve issues are by firms in our sample. Six issues correspond to G19 firms, six issues correspond to US Financial firms. All issues happened during 2008.

[12] Days to Cover: Total Short Interest divided by Average Daily Volume

[13] Many of these issues are by insurance companies not in our sample

Issue Date	Ticker Symbol	Principal (millions)	Sample
06 March 2008	ABK	$250	US Financial Firm
24 March 2008	MTG	$325	US Financial Firm
12 June 2008	KEY	$650	US Financial Firm
12 May 2008	AIG	$5,400	US Financial Firm
23 January 2008	NCC	$1,250	US Financial Firm
21 April 2008	NCC	$6,369	US Financial Firm
24 January 2008	BAC	$6,000	G19 Firm
15 January 2008	C	$12,500	G19 Firm
17 January 2008	C	$2,900	G19 Firm
08 May 2008	FNM	$2,250	G19 Firm
01 April 2008	LEH	$4,000	G19 Firm
15 January 2008	MER	$6,600	G19 Firm

Shorting Activity in Pre-July period in G19 and Control

We first aggregate the NYSE data by firm and day to have a daily measure of how many shares are sold short every day for each firm in our sample. We ignore, for each transaction, the transaction price and the execution time. We are then able to know the shorting volume on a daily basis for a large sample of firms. We use this information to construct several measures of short selling activity in addition to Total Short Interest and Days-to-Cover, which are reported on a bi-monthly basis at best. These are:

1. The ratio of Shorted Shares per day to Float (number of shares outstanding)
2. The ratio of Shorted Shares to Daily trading volume, or Relative Short Sales using the terminology in Diether et al. (2008). We compute this ratio both in daily and monthly frequency. For monthly frequency, we aggregate the number of shorted shares by firm and month, and divide by the total trading volume in the month.
3. The ratio of Short Interest to Float

The ratios (1) and (2) are available until August 8th and show a significant decline for the G19 stocks (not reported). Table III reports descriptive statistics of all the measures, classified by sample group. We average these by year, and cut the data as of June 30th 2008, to avoid the impact of the EO.

[INSERT TABLE III HERE]

The average Short Interest for the G19 stocks has increased 126.98 percent, and the number of shorted shares relative to float has increased by 116.59 percent. Similarly, short interest and shorted shares have increased 121.55 percent and 79.38 percent for US Financial Stocks; and 53.84 percent and 60.78 percent for non-US Financial Firms. Therefore shorting activity has increased overall.

Tests of differences show however that short sales in G19 stocks are not significantly more frequent than for other US Financial institutions. The difference in Total Short Interest between G19 and US Financial Firms is not statistically significant. While the number of shorted shares is significantly higher for G19 firms (a difference of 232 million shares, significant at the one-percent level), Days-to-Cover ratios and shorted shares to float are significantly lower for G19 stocks (-1.61 days and -3.48 percent less, significant at the one-percent level). The finding is similar with respect to non-US financial institutions: G19 stocks are shorted more frequent, but Days-to-Cover are significantly lower.[14]

To provide robustness on the result, we rank the firms in each of the control sample by the corresponding measure of short sale activity. In Table IV we compare the average values of these measures in the G19 stocks, and in the top-ranked 19 stocks in each of the variables, and report the mean values. The average Days-To-Cover ratio for the 19 firms with the highest value in the group of US Financial Firms is 4.93 days, compared to only 1.72 days in G19 stocks. Daily relative short sales are 18.61 percent in the top 19 US stocks, 19.33 percent in the top 19 non-US stocks, and 12.13 in the G19 stocks. We also report the top five firms

[14] The increase in ADR shorts during the period in question may be the result of ADR-ordinary shares (ORDS) arbitrage. Depending upon the custody bank, most ADRs cannot be loaned. Instead they are "pre-released" under a separate contract (not stock loan). An ADR bank's pre-release contract states the receiver of pre-released shares is accepting the pre-release, with the understanding the same amount (or proper ratio of) ORDS will be cancelled. This is how the custody bank insures the proper ratio of ADRs to ORDs in the float. This arbitrage may require a short sale of ADRs vs. a long buy of ORDS. In addition, short selling an ADR may be a cheaper way to exchange an ADR into an ORD. Custody banks charge 5 cents/share to exchange an ADR into an ORD (and vice-versa). There is also a mispricing of ADRs to ORDs due to currency swings, which creates an arbitrage which will tighten the price spread caused by inefficiencies in currency markets. This also may require an ADR short sale.

in each category. Some companies display large amounts of shorting: Ambac Financial Group (ABK), and BB&T Corporation (BBT) are consistently among the top-shorted firms.

[INSERT TABLE IV HERE]

There are also some foreign firms which have registered heavy shorting activities, such as AXA (France), BBVA (Spain), and Aegon (Netherlands) among others.

Figure 1 displays these measures in the time series.

[INSERT FIGURE 1 HERE]

We have also performed a regression analysis on the measures of shorting activity. The set of explanatory variables include measures of liquidity (number of shares outstanding, trading volume). We control for the exchange where the stock lists (Nasdaq, NYSE, OTC) with three indicator variables,[15] and for insider and institutional ownership. We control for firm size with the firm's market capitalization, and include three indicators that equal one when the firm is in the G19 group, US financial stocks, non-US financial stocks respectively. We additionally construct a measure of convertible bonds issuance. To that end, we compute the ratio of convertible bond principal to market capitalization, and measure, for each day and firm, whether there was a convertible issue in the past 60 days, assigning then the ratio above as a measure of convertible issuance intensity.

The regression is estimated with year-month-day fixed-effects[16], and with robust standard errors. Results are reported in Table V. We find results consistent with the previous tables. After controlling for firm characteristics, G19 stocks display less frequent shorting: lower Short Interest, fewer Days-to-Cover, and lower percentages of Shorted Shares to Float and Shorted Shares to Trading Volume. These results are all significant at the one-percent probability level. Interestingly, we confirm that the issuance of convertible bonds induces short sales. In economic terms, an issue of convertible bonds which is equivalent to 10 percent of market

[15] We exclude the OTC dummy variable to allow identification

[16] This is equivalent to estimating a single, independent effect for each day in the sample period

capitalization, induces short sales of 4.5 million shares, or equivalently increases Days-to-Cover by 0.08 days.

[INSERT TABLE V HERE]

Overall, we conclude that there is clear evidence that shorting activity in G19 stocks has been average at best, and our data suggests that shorting activity outside the G19 stocks has been much more frequent for certain stocks.

Short Sales and Stock Returns, before the Emergency Order

Having reported the typical measures of short sale activity, we know proceed to measure their impact on pricing. In order to avoid measurement errors and liquidity concerns, we aggregate stock returns and firm characteristics at the weekly level (Friday to Friday). We then subtract the overall market return, and regress market-adjusted weekly stock returns on explanatory variables.

[INSERT TABLE VI HERE]

We use the same explanatory variables as above. In particular, institutional and insider ownership have been shown in the literature to have a pricing effect: institutional investors play a monitoring, value-enhancing role in corporations, while inside ownership reduces liquidity and increases agency problems. We additionally control for the stock return in the previous week, expressing all variables in logarithms to allow for easy economic interpretation.

We find that:

a. Stock returns are negatively related to trading volume, which is in line with the existing literature.
b. Short Sales have a negative impact on stock returns. An daily increase in Short Interest of 1,000 shares results in 17 bps lower returns. An increase in Days-to-Cover by one reduces returns by 17 bps.
c. After controlling for size and trading volume, G19 stocks display significantly higher weekly returns. However the relatively negative

performance of this group is not due to short sales. The interaction between short sale measures and the G19 indicator dummy is not significant in any of the specifications (numbers in bold in the table).

Market Quality and Short Sales

Market quality refers to the ability of a trader to execute an order in a transparent and efficient way. This is equivalent to reduced information asymmetries and transaction costs, enhanced liquidity and market depth.

We follow Diether et al. (2008) and construct several measures of market quality in our dataset. They are:

1. Volatility measures:
    a. Square Absolute Return Open to Close. We compute returns from the opening to the closing each day, and use the square absolute value as a measure of intra-day volatility. High quality markets tend to display higher intra-day volatility.
    b. Square Absolute Return Close to Close. Similar to above, but for returns computed from last-day closing, to current day closing.
    c. Trade Price Range, computed as $(P_{high}-P_{low})/ P_{high}$, where P_{high} and P_{low} are the highest and lowest prices quoted during the trading day
    d. Negative Semi-Variance, which is the mean squared standard deviation of returns, conditional on returns being negative.
    e. Positive Semi-Variance, idem for positive returns.

2. Liquidity measures:
    a. Quoted Spread, which equals $P_{ask}-P_{bid}$.
    b. Relative Quoted Spread, or $(P_{ask}-P_{bid})/[(P_{ask}+P_{bid})/2]$, or the quoted spread relative to the bid-ask midpoint.

In Table VII we report regression results on these measures. Overall we find that G19 stocks are more volatile and less liquid in the period July 2006-June 2008. The trade price range is 0.6 percent larger for G19 stocks (result significant at the one-percent level). Positive semi-variance, as well as close-to-close volatility, are also

significantly higher for G19 stocks. Liquidity is lower because both quoted and relative spreads are larger ($0.044 and 8.9 percent higher respectively). Volatility is lower, and liquidity is higher for larger stocks (which is intuitive). Institutional ownership increases liquidity, and inside ownership increases volatility. Finally NYSE stocks are more volatile, and Nasdaq stocks are relatively less liquid. All these results are statistically significant.

[INSERT TABLE VII HERE]

In Table VIII we analyze the effect of short sale activity on the quality of the market. Because the transaction we use only starts in January 2007, we estimate the regressions with and without the Shorted Stock / Trading Volume explanatory variable. There are two important results that arise from this analysis. First we find that short sales have a significant effect on market quality. The higher the short interest and the ratio of short sales to trading volume, the higher the intra-day volatility measured by the trading range. This is consistent with Diether et al. (2008) and Bris et al. (2007). Also, short sales increase market liquidity: an increase of the relative short sale ratio by one percent in the typical stock reduces the relative quoted spread by 52.7 percent (significant at the five-percent level), and the trade price range by 1.9 percent (significant at the 10 percent level)

Second, after controlling for short sales, the market quality of the G19 stocks remains the same: they are more volatile and less liquid.

[INSERT TABLE VIII HERE]

The time series behavior of all our measures of market quality can be better seen in Figure 2.

[INSERT FIGURE 2 HERE]

The Effect of the Emergency Order

Impact on Market Quality

The July 2008 order restricts naked short sales with the objective to increase market quality. Indeed, the SEC release states that:

> *"The SEC's mission to protect investors, maintain orderly markets, and promote capital formation is more important now than it has ever been," said SEC Chairman Christopher Cox. "Today's Commission action aims to stop unlawful manipulation through 'naked' short selling that threatens the stability of financial institutions. We will continue our vigorous commitment to investors by working within the SEC and in close cooperation with our regulatory counterparts to promote the continued health and vibrancy of our markets."*[17]

Therefore the relationship between market volatility and liquidity, and the prohibition of naked short sales is an empirical question. Our sample of firms including companies affected and not affected by the EO allows us to test such relationship.

[INSERT TABLE IX HERE]

In Table IX we compare the average measures of market quality between July 1st 2006 and July 15th, 2008, with the post-EO period which spans the period July 21st, 2008 to August 8th 2008. We report significant volatility increases: open-to-close and close-to-close volatility increase 158 percent and 188 respectively. Trade price range increases 4.37 percent in the post-EO period. The table reports similar results for other measures.

Are these increases caused by the EO? When we look at the comparable sample of US Financial stocks, we also find significant, yet lower, increases: open-to-close and close-to-close volatilities increase 80 percent and 170 percent respectively; trade price range increases 4.20 percent.

The right-side columns in Table IX compare the market quality measures of the G19 stocks and the comparable sample. We do not find significant differences in volatility either in the pre- or post-EO period between G19 and US financial firms.

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[17] SEC Release 2008-143

However, differences in liquidity significantly deteriorate. Before the EO, quoted and relative spreads are $0.03 and 6.31 percent larger for G19 stocks. After the EO, the differences have increased to $0.06 and 19.90 percent respectively.

We find similar results relative to the sample of non-US firms. Before the EO, G19 stocks are significantly more liquid than foreign stocks, but the liquidity advantage dissipates after the EO. Instead, volatility becomes much higher (the trade price range is 3.19 percent higher in G19 stocks in the post-EO period).

[INSERT TABLE X HERE]

The regression results in Table X provide a deeper analysis. Controlling for firm and market characteristics, the EO has led to a significant increase in market liquidity. After the EO, the quoted spread has increased 3.3 cents, and the relative spreads have increased 8.5 percent. In terms of volatility, we find a significant decrease in trade price range (1.5 percent reduction), and in positive semi-variance (coefficient of -0.085) both significant at the one-percent level.

Impact on Market Efficiency

Diamond and Verrecchia (1987) argue theoretically that short sales constraints impede the market's ability to rapidly impound value-relevant information. As the voluminous literature on the efficient market theory suggests, there is no universal test for relative market efficiency, although event studies and filter rules have a long history of application. Mørck et al. (2000) observe that more efficient markets can be expected to have more idiosyncratic risk, since the ratio of firm-specific information to market-level information is likely to be higher in informational environments that allow market participants to acquire information and act quickly and inexpensively upon it.

We follow Mørck et al. (2000) and Bris et al. (2007) to compute measures of efficiency in the following way. We classify observations for each of the three groups of firms in two time periods. The first time period ranges from June 1st 2008 to July 15th 2008. The second sub-period spans July 21st 2008 to August 8th, 2008. We then run a regression of stock returns by group of firm and sub-period of the following form:

$$R_{it} = \alpha_i + \beta \times R_{mt} + \varepsilon_{it} \quad (1)$$

where R_i and R_m are respectively the daily stock and daily market returns. The intercept is firm specific, which is equivalent to estimating the regression with firm-fixed effects. We then calculate the R-squared in the regression. The estimate represents the co-movement between individual stock returns and the market. More co-movement implies less efficiency.

We calculate two separate measures of individual security co-movement. Let R_{mt}^{+} equal the market return when it is either positive or zero, and let R_{mt}^{-} equal the market return when it is negative. We compute the R-squared in similar regressions to (1), and denote them by upside and downside R-squared respectively. Bris et al. (2007) have shown that in the presence of short-sale restrictions, the downside-R squared is higher because negative market information cannot flow naturally into individual stock prices.

We also compute cross-autocorrelation coefficients, which equal the correlation between the previous day market return, and current individual stock returns, and average them across samples and sub-periods. As with the co-movement measures, we compute an upside and a downside cross-autocorrelation coefficient and report all these statistics in Table XI.

[INSERT TABLE XI HERE]

We find an important deterioration of market efficiency as a result of the EO. The R-squared increases from 22 to 33 percent US financial firms (an absolute increase of 11 percent). R-squared increases 12 percent for G19 firms. Cross-autocorrelation increases by the same magnitude in G19 and US financial stocks. However, cross-autocorrelation increases much more for G19 than for US financial stocks. Downside Cross-correlation increases 3.26 percent for G19 stocks, while it decreases 4.05 percent for US financial institutions. Similarly, the downside R-squared increases 27 percent for G19 stocks, and only 0.75 percent for peers. This is consistent with a restriction in short sales impeding the flow of negative information into market prices. It is also interesting to benchmark the deterioration in efficiency in G19 stocks with non-US stocks. Cross-autocorrelation of foreign firms increases only 3.31 percent, and R-squared increases 3.31. As these stocks can mostly be shorted in their home markets, short sale restrictions in the U.S. do not have a significant impact on efficiency.

Abnormal Returns around the Emergency Order

In the last part of this study we analyze the performance of stock returns for our sample of financial stocks around July 15th. To that end, we estimate market model regressions of individual stock returns on market returns using daily observations in the period March 1st, 2008 to May 31st, 2008. We use the estimated coefficients to compute abnormal returns and cumulative abnormal returns in the period June 1st to August 8th, as $AR_i=R_i-\alpha-\beta \times R_m$, where R_i and R_m are respectively individual and market returns.

Table 12 reports Cumulative and Abnormal returns for different subperiods, and differences across subgroups of stocks. Our findings can be summarized as follows:

1. The **announcement of the EO is associated to an Abnormal Return (AR) for the g19 stocks of -4.1 percent.** This is however not statistically significant (naturally as there are only 19 stocks). Non-G19 stocks do not suffer that negative announcement.
2. Overall, **the total performance of G19 stocks (from July 15th to August 8th) is 10 percent worse than for peers** (significant result at the five percent level)
3. The the CAR from July 21 onwards (the implementation of the EO period) is consistent with the literature, in that stocks that are more difficult to short (G19 stocks) display subsequent lower returns. The 10 percent worse performance of G19 stocks vs peers between July 21 and August 8th has a dramatic economic significance. With $1,540bn of total market capitalization of the G19 stocks, a such a negative loss relative is equivalent to about USD154bn loss for the G19 shareholders in about 15 trading days.

[INSERT TABLE XII HERE]

See Table 12 and Figure 3 for detailed results.

[INSERT FIGURE 3 HERE]

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	N		Total Return January 1, 2008 to July 31, 2008	EBIT Margin	Debt / Assets	Cash Flow to Sales	Return on Assets	Total Assets (Billions)	Market Capitalization (Billions)
G19 Stocks	**19**	**Mean**	**-42.78%**	**39.30%**	**49.54%**	**11.69%**	**2.18%**	**$1,230.00**	**$90.50**
		Median		**25.41%**	**39.77%**	**12.30%**	**1.25%**	**$1,120.00**	**$84.00**
US Financial Institutions	60	Mean	-34.76%	12.01%	18.61%	24.80%	2.59%	$150.00	$24.30
		Median		24.20%	14.92%	22.69%	1.79%	$69.30	$15.70
Non-US Financial Institutions	73	Mean	-20.87%	28.71%	24.20%	20.36%	3.42%	$304.00	$35.40
		Median		29.25%	21.64%	19.08%	2.08%	$125.00	$27.70
Total	152	Mean	-28.35%	24.32%	24.36%	20.77%	2.95%	$327.00	$39.60
		Median		25.77%	19.85%	20.34%	1.90%	$128.00	$26.50

Table 1. Sample Description

The Table reports measures of size and profitability as of December 2007 (except for stock returns) for the base sample of 19 stocks affected by the Emergency Order, the control sample of U.S. Financial Institutions, and the control sample of non-U.S. Financial Institutions. Accounting variables are from Worldscope.

Base Sample: Stocks Affected by July Emergency Order

	Company Name	Ticker	Main Exchange
1	Allianz Aktiengesellschaft	AZ	NYSE
2	Bank Of America Corp	BAC	NYSE
3	Barclays PLC	BCS	NYSE
4	BNP Paribas	BNPQF/BNPQY	OTC
5	Citigroup Inc	C	NYSE
6	Credit Suisse Group	CS	NYSE
7	Daiwa Securities Group Inc	DSECY	OTC
8	Deutsche Bank Group AG	DB	NYSE
9	Fannie Mae	FNM	NYSE
10	Freddie Mac	FRE	NYSE
11	Goldman Sachs Group Inc	GS	NYSE
12	HSBC Holdings plc	HBC	NYSE
13	JPMorgan Chase & Co.	JPM	NYSE
14	Lehman Bros Holdings Inc	LEH	NYSE
15	Merrill Lynch & Co Inc	MER	NYSE
16	Mizuho Financial Gp Adr	MFG	NYSE
17	Morgan Stanley	MS	NYSE
18	Royal Bank of Scotland Group plc	RBS	NYSE
19	UBS AG	UBS	NYSE

Control Sample 1: Domestic Stocks

	Company Name	Ticker	Main Exchange
1	A C E Limited	ACE	NYSE
2	A F L A C Inc	AFL	NYSE
3	ACE Ltd.	ACE	NYSE
4	AFLAC Inc.	AFL	NYSE
5	Allstate Corp	ALL	NYSE
6	Ambac Financial Group Inc.	ABK	NYSE
7	American Express Co	AXP	NYSE
8	American International Group Inc.	AIG	NYSE
9	Aon Corp.	AOC	NYSE
10	B B & T Corp	BBT	NYSE
11	Bank Of New York Co Inc	BK	NYSE
12	BB&T Corp.	BBT	NYSE
13	Capital One Financial Corp.	COF	NYSE
14	Charles Schwab Corp.	SCHW	NASDAQ
15	Chubb Corp	CB	NYSE
16	Cincinnati Financial Corp.	CINF	NASDAQ
17	Comerica Inc	CMA	NYSE
18	Federal Home Ln Mtg Corp	FRE	NYSE
19	Fifth Third Bancorp	FITB	NASDAQ
20	Franklin Resources Inc	BEN	NYSE
21	H S B C Holdings Plc Adr	HBC	NYSE
22	Hartford Finl Svcs Grp	HIG	NYSE
23	Huntington Banc	HBAN	OTC
24	Janus Capital Group Inc.	JNS	NYSE
25	KeyCorp	KEY	NYSE
26	Lincoln National Corp	LNC	NYSE
27	Loews Corp.	L	NYSE
28	M B I A Inc	MBI	NYSE
29	M G I C Invt Corp	MTG	NYSE
30	Marsh & Mclennan	MMC	NYSE
31	Marshall & Ilsley Corp	MI	NYSE
32	MBIA Inc.	MBI	NYSE
33	Metlife Inc	MET	NYSE
34	MGIC Investment Corp.	MTG	NYSE
35	National City Corp	NCC	NYSE
36	Northern Trust Corp.	NTRS	NASDAQ
37	P N C Financial Svcs Grp	PNC	NYSE
38	Progressive Corp Ohio	PGR	NYSE
39	S L M Corp	SLM	NYSE
40	Safeco Corp.	SAF	NYSE
41	SLM Corp.	SLM	NYSE
42	State Street Corp	STT	NYSE
43	Suntrust Banks Inc	STI	NYSE
44	Synovus Financial Corp	SNV	NYSE
45	T. Rowe Price Group Inc.	TROW	NASDAQ
46	The Bank of New York Mellon Corp.	BK	NYSE
47	The Chubb Corp.	CB	NYSE
48	The Hartford Financial Services Group Inc.	HIG	NYSE
49	The PNC Financial Services Group Inc.	PNC	NYSE
50	The Progressive Corp.	PGR	NYSE
51	The Travelers Companies Inc.	TRV	NYSE
52	Torchmark Corp	TMK	NYSE
53	U S Bancorp Inc	USB	NYSE
54	Unum Group	UNM	NYSE
55	Wachovia Corp	WB	NYSE
56	Washington Mutual Inc	WM	NYSE
57	Wells Fargo & Company	WFC	NYSE
58	X L Capital Ltd Cl A	XL	NYSE
59	Zions Ban Corp.	ZION	NASDAQ

Control Sample 2: Non-US Stocks

	Company Name	Ticker	Main Exchange
1	A B N Amro Hldg N V Ads	ABN	NYSE
2	A X A Ads	AXA	NYSE
3	ABN AMRO Holding N.V.	ABN	NYSE
4	ABSA GROUP LTD NEW A	AGRPY	OTC
5	Admin Fondos Pension Adr	PVD	NYSE
6	Aegon N V	AEG	NYSE
7	AKBANK TURK ANO ADR	AKBTY	OTC
8	Allied Irish Banks Adr	AIB	NYSE
9	Alpha Bank AE Sponsored ADR	ALBKY	OTC
10	Anglo Irish Bank Corp Plc Sponsored ADR	AGIBY	OTC
11	Australia and New Zealand Banking Group Ltd.	ANZ	NYSE
12	AXA	AXA	NYSE
13	B B V A Banco Frances Sa	BFR	NYSE
14	Banco Bilbao Viz Arg S A	BBV	NYSE
15	Banco Bradesco S.A.	BBD	NYSE
16	Banco de Chile	BCH	NYSE
17	Banco Ita Holding Financeira S.A.	ITU	NYSE
18	Banco Macro Bansud S.A.	BMA	AMEX
19	Banco Santander Central Hispano S.A.	STD	NYSE
20	Banco Santander Chile	SAN	NYSE
21	Banco Santander Ctr Adr	STD	NYSE
22	Banco SantanderChile	SAN	NYSE
23	BanColombia S.A.	CIB	NYSE
24	Banesto S A Reg	BNSTY	OTC
25	BANK EAST ASIA LTD S	BKEAY	OTC
26	Bankinter SA New Sponsored ADR	BKNIY	OTC
27	BBVA Banco Frances S.A.	BFR	NYSE
28	Catlin Group Ltd. Sponsored ADR	CNGRY	OTC
29	China Life Insurance Adr	LFC	NYSE
30	CNinsure Inc.	CISG	NASDAQ
31	COMMERZBANK A G SPON	CRZBY	OTC
32	COMPUTERSHARE LTD SP	CMSQY	OTC
33	Corpbanca	BCA	NYSE
34	DBS GROUP HOLDINGS L	DBSDY	OTC
35	Erste Bank Der Oesterreichischen Sparkassen Ag	EBKDY	OTC
36	Fortis NL	FORSY	OTC
37	Grupo Financiero Galicia S.A.	GGAL	NASDAQ
38	H D F C Bank Ltd Adr	HDB	NYSE
39	Hang Seng Bk Ltd Ord	HSNGY	OTC
40	HANNOVER RUCKVERSICH	HVRRY	OTC
41	HBOS PLC SPONS ADR	HBOOY	OTC
42	HDFC Bank Ltd.	HDB	NYSE
43	I N G Group Nv Adr	ING	NYSE
44	Icici Bank Ltd Adr	IBN	NYSE
45	ING GROEP N.V.	ING	NYSE
46	Intesa Sanpaolo Adr	ISNPY	OTC
47	Kookmin Bank	KB	NYSE
48	LEGAL & GENERAL GROU	LGGNY	OTC
49	Liberty Group Ltd New Sponsored ADR	LYGRY	OTC
50	Lloyds Tsb Group Adr	LYG	NYSE
51	Mercantil Servicios Financieros CA Ser B New Spons A	MSFJY	OTC
52	Metropolitan Holdings Ltd Sponsored ADR 1:10	MPOHY	OTC
53	Mitsubishi UFJ Financial Group Inc.	MTU	NYSE
54	N I S Group Co Ltd Ads	NIS	NYSE
55	National Bank Greece Ads	NBG	NYSE
56	NEDBANK GROUP LTD AD	NDBKY	OTC
57	NIS Group Co. Ltd.	NIS	NYSE
58	Nomura Holdings Inc Adr	NMR	NYSE
59	Prudential plc	PUK	NYSE
60	SCOR	SCO	NYSE
61	Shinhan Financial Gp Adr	SHG	NYSE
62	Societe Generale France Sponsored ADR	SCGLY	OTC
63	ST GEORGE BANK LTD S	STGKY	OTC
64	SUMITOMO TRUST & BAN	STBUY	OTC
65	SWISS REINSURANC ADR	SWCEY	OTC
66	The Governor and Company of the Bank of Ireland	IRE	NYSE
67	Tokio Marine Holdings Inc. Sponsored ADR	TKOMY	OTC
68	Turkiye Garanti Bank	TKGBY	OTC
69	UNITED OVERSEAS BK L	UOVEY	OTC
70	Westpac Banking Corp.	WBK	NYSE
71	Wing Hang Bank Ltd ADR	WGHGY	OTC
72	Woori Finance Holdings Co. Ltd.	WF	NYSE
73	Zuerich Financial Services	ZFSVY	OTC

Table 2. Base and Control Samples

List of stocks affected by the July 15th emergency order, and control samples. The base sample includes 19 stocks for which naked short sales were restricted after July 15th, 2008. We construct two control samples. The first control sample includes U.S. Financial Institutions in the same two-digit SIC code as the stocks in the base sample, with data available in Datastream in Worldscope. The second control sample includes non-U.S. financial institutions in the same two-digit SIC code as the stocks in the base sample, listed in U.S. exchanges either through an ADR or direct listing.

	G-19 Stocks			U.S. Financial Stocks			Difference G19 - US Financial Stocks			
	2007	2008	% Increase	2007	2008	% Increase	2007		2008	
Total Short Interest (x 1,000 shares)	12,600	28,600	126.98%	11,600	25,700	121.55%	1,000 ***	(0.0016)	2,900	(0.5459)
Shorted Shares - Total Month (x 1,000 shares)	218,110	297,888	36.58%	55,877	64,974	16.28%	162,233	(0.9310)	232,913 ***	(0.0003)
Days To Cover	1.88	1.72	-8.67%	3.81	3.33	-12.50%	-1.92 ***	(0.0010)	-1.61 ***	(0.0001)
Shorted Shares to Float - Daily	0.96%	2.09%	116.59%	3.11%	5.57%	79.38%	-2.14% ***	(0.0004)	-3.48% ***	(0.0013)
Short Interest to Float	1.39%	3.91%	182.01%	3.59%	6.99%	94.49%	-2.21% ***	(0.0016)	-3.08%	(0.5459)
Relative Short Sales - Daily	12.68%	12.13%	-4.38%	12.66%	13.01%	2.77%	0.02%	(0.5060)	-0.88%	(0.4226)
Relative Short Sales - Monthly	12.53%	11.25%	-10.21%	8.83%	8.55%	-3.18%	3.71%	(0.1513)	2.71%	(0.2365)
Trading Volume Month (x 1,000 shares)	7,746	20,427	163.71%	4,125	9,916	140.40%	3,621	(0.8287)	10,511	(0.8739)
Market Capitalization	101	72.2	-28.51%	27.9	21	-24.73%	73.1 ***	(0.0000)	51.2 ***	(0.0000)

	Non-U.S. Financial Stocks			Difference G19 - Non-US Financial Stocks			
	2007	2008	% Increase	2007		2008	
Total Short Interest (x 1,000 shares)	596	917	53.84%	12,004 ***	(0.0000)	27,683 ***	(0.0000)
Shorted Shares - Total Month (x 1,000 shares)							
Days To Cover	17.47	28.53	63.31%	-15.59	(0.3840)	-26.81 *	(0.0873)
Shorted Shares to Float - Daily	0.13%	0.20%	60.78%	0.84% ***	(0.0002)	1.89% ***	(0.0000)
Short Interest to Float	0.34%	0.47%	36.73%	1.04% ***	(0.0000)	3.45% ***	(0.0000)
Relative Short Sales - Daily	6.49%	6.42%	-1.15%	6.19% ***	(0.0050)	5.71% ***	(0.0088)
Relative Short Sales - Monthly							
Trading Volume Month (x 1,000 shares)	386	565	46.27%	7,360 ***	(0.0000)	19,862 ***	(0.0000)
Market Capitalization	24.7	22.1	-10.53%	76.3 ***	(0.0000)	50.1 ***	(0.0000)

Table 3. Short Selling Activity in the Base and Control Samples, before July 2008

The Table reports measures of short-selling activity for the stocks in the total sample. Shorted Shares to Float - Daily are computed every day as the number of shares shorted in the day, divided by the number of shares outstanding, averaged out across stocks, and accumulated every month. Shorted Shares to Float -Monthly are computed as the total number of shares sold short in a month, divided by the float, for each stock, and then averaged across months. Relative Short Sales – Daily is the number of shares sold short relative to the daily trading volume, averaged across firms and months and multiplied times the number of trading days in the month. Relative Short Sales – Monthly is the total number of shares sold short in a month for each firm, relative to the monthly trading volume, averaged across firms. Short Sale data is from NYSE and Nasdaq. The sample includes observations from July 1st, 2006, to June 30th, 2008.

	Total Short Interest (x 1,000 shares)	Shorted Shares - Total Month (x 1,000 shares)	Days To Cover	Shorted Shares to Float - Daily	Short Interest to Float	Relative Short Sales - Daily	Relative Short Sales - Monthly
G19 Stocks	28,600	297,888	1.72	2.09%	3.91%	12.13%	11.25%
Top 19 Stocks - US Financial Stocks	311,000	551,716	4.93	10.63%	1367.32%	18.61%	20.22%
Top 19 Stocks - non-US Financial Stocks			93.53	0.65%	63.23%	19.33%	
Top 5 Firms in Each Category							
US Financial Institutions	ABK	ABK	ABK	ABK	ALL	ABK	AEG
	AIG	AIG	BBT	BBT	AOC	BBT	AIB
	AXP	AXP	BEN	CMA	BBT	CMA	ABK
	BBT	BBD	CMA	COF	BEN	COF	BBT
	COF	BBT	COF	FITB	CB	FITB	BBV
Non-US Financial Institutions	AEG		AGIBY	AIB	AEG	AGIBY	
	AXA		AKBTY	BBD	AIB	AIB	
	BBD		ALBKY	BBV	AXA	BBD	
	BBV		BKEAY	BCA	BBV	BBV	
	BMA		BMA	BFR	BCA	BFR	

Table 4. Short Selling Activity in the Base and Control Samples, in 2008

The Table reports measures of short-selling activity for a subsample of stocks from January 1st 2008 to June 30th 2008. Numbers for the G19 stocks are the same as in Table 3. For the control samples, we rank firms by each of the measures of short selling activity, and compute averages for the top 19 firms in each category. The table also reports the top five firms in each category. Shorted Shares to Float - Daily are computed every day as the number of shares shorted in the day, divided by the number of shares outstanding, averaged out across stocks, and accumulated every month. Shorted Shares to Float -Monthly are computed as the total number of shares sold short in a month, divided by the float, for each stock, and then averaged across months. Relative Short Sales – Daily is the number of shares sold short relative to the daily trading volume, averaged across firms and months and multiplied times the number of trading days in the month. Relative Short Sales – Monthly is the total number of shares sold short in a month for each firm, relative to the monthly trading volume, averaged across firms. Short Sale data is from NYSE and Nasdaq. The sample includes observations from July 1st, 2006, to June 30th, 2008.

Dependent Variable	Total Short Interest (x 1000 shares)	Days to Cover	1 + Shorted Shares to Float - Daily (logs)	1+ Relative Short Sales - Daily (logs)
Constant	-1.053***	3.463***	0.138	0.243***
	[2.96]	[44.88]	[1.08]	[72.03]
G19 Stock (Y/N)	**-4.150*** **	**-1.028*** **	**0.057**	**-0.014*** **
	[12.95]	**[38.03]**	**[1.59]**	**[14.25]**
Non-US Stock (Y/N)	-4.949***	-0.957***	-0.321***	-0.022***
	[27.76]	[16.15]	[6.33]	[10.77]
Conv. Am. 60 days / markcap	51,060.564***	5,872.767***	3,821.953***	90.473***
	[2.70]	[4.67]	[7.35]	[3.49]
Market Capitalization (Billion)	0.060***	-0.009***	-0.006***	-0.000***
	[21.58]	[34.30]	[14.49]	[10.09]
Daily Trading Volume (x 1000 shares)	0.001***	0.000***	0.000***	-0.000***
	[26.24]	[5.67]	[2.80]	[18.34]
Stock Return Previous Day	5.16	-2.016***	-1.12	0.097***
	[0.89]	[3.40]	[0.73]	[6.00]
log (1+ % Institutional Ownership)	2.124***	0.085***	0.227***	-0.017***
	[21.74]	[4.61]	[11.93]	[21.63]
log(1+ % Insider Ownership)	-0.370***	0.037***	0.126***	-0.003***
	[6.31]	[3.74]	[8.68]	[7.70]
Shares Outstanding	0.388***	0.012*	0.058***	-0.003***
	[7.42]	[1.87]	[5.74]	[7.94]
NYSE Stock (Y/N)	1.877**	0.058		
	[1.99]	[0.29]		
NASDAQ Stock (Y/N)	0.947	0.675**		
	[1.00]	[2.41]		
Observations	37,110	37,110	1,506	21,921
R-squared	0.59	0.21	0.58	0.2

Robust t statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5. Regression Analysis: Short Sales and Stock Characteristics

Regression of measures of short-selling activity on stock characteristics. Shorted Shares to Float are computed every day as the number of shares shorted in the day, divided by the number of shares outstanding. Relative Short Sales – Daily is the number of shares sold short relative to the daily trading volume. Short Sale data is from NYSE and Nasdaq. The sample includes observations from July 1st, 2006, to June 30th, 2008. The regression is estimated with time fixed effects. Standard errors are robust.

Dependent Variable: Market-Adjusted Weekly Return (%)	(I)	(II)	(III)	(IV)
Constant	-0.227	-0.294	2.501*	-4.551***
	[0.70]	[0.86]	[1.87]	[6.56]
Stock Return Previous Week	-0.001*	-0.001*	0.002**	-0.001*
	[1.91]	[1.90]	[2.29]	[1.85]
Daily Trading Volume (x 1000 shares)	-0.000***	-0.000***	-0.000***	-0.000***
	[2.65]	[4.50]	[2.93]	[2.76]
log (1+ % Institutional Ownership)	-0.011	0.096	0.103	0.188*
	[0.16]	[1.33]	[0.44]	[1.78]
log(1+ % Insider Ownership)	0.041	0.053	0.256	0.017
	[0.71]	[0.91]	[1.25]	[0.19]
G19 Stock (Y/N)	**-0.242**	**0.108**	**-2.149****	**1.776****
	[1.26]	**[0.39]**	**[2.04]**	**[2.08]**
Non-US Stock (Y/N)	0.049	0.156	-2.815**	3.155***
	[0.20]	[0.56]	[2.50]	[4.96]
Total Short Interest (x 1000 shares)	-17.418**			
	[2.39]			
Total Short Interest x Non-US Stock	99.467***			
	[2.61]			
Total Short Interest x G19 Stock	**32.263*****			
	[2.92]			
Days to Cover		-0.173***		
		[4.52]		
Days to Cover x Non-US Stock		0.125**		
		[2.29]		
Days to Cover x G19 Stock		**-0.019**		
		[0.20]		
Shorted Shares Relative to Float (logs)			-2.721***	
			[3.00]	
Shorted Shares to Float x Non-US Stock			4.038***	
			[3.52]	
Shorted Shares to Float x G19 Stock			**2.244****	
			[2.03]	
Relative Shorting (logs)				16.779***
				[6.64]
Relative Shorting x Non-US Stock				-14.214***
				[4.77]
Relative Shorting x G19 Stock				**-8.998***
				[1.77]
NYSE Stock (Y/N)	1.417**	1.517**		
	[2.11]	[2.27]		
NASDAQ Stock (Y/N)	1.364*	1.497**		
	[1.93]	[2.14]		
Observations	7,761	7,761	1,439	4,572
R-squared	0.39	0.39	0.42	0.4

Robust t statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6. Weekly Stock Returns and Shorting Activity

Regression of weekly stock returns on shorting activity and stock characteristics. Weekly returns are computed as Stock Price Index at the end of the week relative to the Stock Price Index at the beginning of the week, in logs. Shorted Shares to Float are computed every day as the number of shares shorted in the day, divided by the number of shares outstanding. Relative Short Sales – Daily is the number of shares sold short relative to the daily trading volume. Short Sale data is from NYSE and Nasdaq. The sample includes observations from July 1st, 2006, to June 30th, 2008. The regression is estimated with time fixed effects. Standard errors are robust.

	Square Absolute Return Open to Close (x 100)	Square Absolute Return Close to Close (x 100)	Quoted Spread	Relative Quoted Spread	Trade Price Range	Negative Semi-Variance	Positive Semi-Variance
Constant	0.032	0.316	0.072***	0.236***	0.023***	0.054***	0.029***
	[0.06]	[0.48]	[3.94]	[5.03]	[11.75]	[3.99]	[4.99]
G19 Stock (Y/N)	**1.73**	**2.376***	**0.044****	**0.089*****	**0.006*****	**-0.001**	**0.011***
	[1.61]	**[1.84]**	**[2.49]**	**[2.82]**	**[4.08]**	**[0.08]**	**[1.91]**
Foreign Stock (Y/N)	0.591	1.131*	0.062***	0.184***	0.004**	0.004	0.010**
	[1.30]	[1.78]	[3.36]	[4.50]	[2.24]	[0.43]	[2.19]
Daily Trading Volume (x 1000 shares)	0.001	0.001	0.001	0.001***	0.001***	0.001***	0.001***
	[1.02]	[1.34]	[0.56]	[2.70]	[3.09]	[2.41]	[2.46]
Market Capitalization (Billion)	-6.668***	-9,834***	-0.323**	-1.587***	-0.148***	-0.781***	-0.375***
	[3.66]	[3.56]	[2.48]	[3.35]	[5.56]	[3.64]	[4.39]
log (1+ % Institutional Ownership)	0.105	-0.018	-0.009*	-0.028***	0.001	-0.009**	-0.003*
	[1.00]	[0.12]	[1.77]	[2.60]	[1.61]	[2.40]	[1.71]
log(1+ % Insider Ownership)	0.419	0.796**	0.014	-0.001	0.001	0.005	0.005*
	[1.59]	[2.22]	[1.46]	[0.06]	[1.60]	[1.03]	[1.75]
NYSE Stock (Y/N)	0.236	0.181	-0.003	0.028	-0.002	0.008	0.004
	[1.25]	[0.58]	[0.24]	[0.99]	[1.14]	[0.66]	[0.64]
NASDAQ Stock (Y/N)	-0.39	-0.719	-0.046***	-0.01	0.001	0.024	0.003
	[1.17]	[1.39]	[3.39]	[0.31]	[0.46]	[0.77]	[0.43]
Observations	51292	52433	52436	52436	49576	52433	52436
R-squared	0.11	0.09	0.1	0.06	0.51	0.07	0.1

Robust t statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7. Market Quality Pre-Emergency Order

Regression of measures of market quality on stock chacteristics. Volatility (Close-to-Close) is the square of daily returns from closing to next day closing. Volatility (Open-to-Close) is th square of daily returns from opening to closing. Quoted spread is the bid-ask difference. Relative Spread is the bid-ask difference relative to the bid-ask midpoint. Turnover by volume is trading volume relative to total number of listed shares (for non-US stocks it also includes shares in domestic market). Negative (Positive) semivariance is the mean square deviations of returns conditional on returns being negative (positive). The sample includes observations from July 1st, 2006, to July 15th, 2008. The regression is estimated with time fixed effects. Standard errors are robust, and clustered by firm.

	Square Absolute Return Open to Close (x 100)		Square Absolute Return Close to Close (x 100)		Quoted Spread		Relative Quoted Spread		Trade Price Range		Negative Semi-Variance		Positive Ser
Constant	-0.742	-0.275	-0.628	-0.079	0.068*	0.053**	0.405***	0.279***	0.033***	0.023***	0.141***	0.066***	0.058***
	[0.65]	[0.34]	[0.44]	[0.08]	[1.88]	[2.00]	[4.46]	[3.17]	[6.87]	[8.77]	[2.66]	[3.05]	[3.09]
Total Short Interest (x 1000 shares)	-0.019	-0.019	-0.033*	-0.034*	0.000	0.000	0.001**	0.001**	0.000**	0.000***	-0.001	-0.001	0
	[1.47]	[1.56]	[1.77]	[1.93]	[1.59]	[1.42]	[2.26]	[2.50]	[2.21]	[2.66]	[1.25]	[1.07]	[0.28]
Days to Cover	-0.017	0.008	-0.033	0.017	0.005	0.004	0.011**	0.004	0.001	0.000	0.005	0.002	0.001
	[0.44]	[0.32]	[0.57]	[0.54]	[1.02]	[0.97]	[1.98]	[0.63]	[1.02]	[0.56]	[1.29]	[1.28]	[1.07]
Shorted Stock Relative to Trading Volume (logs)	1.799		3.488*		0.001		-0.527***		-0.019*		-0.164		-0.042
	[1.50]		[1.71]		[0.02]		[3.99]		[1.90]		[1.41]		[1.01]
G19 Stock (Y/N)	**2.215**	**1.797**	**2.886**	**2.326**	**0.050****	**0.047****	**0.082****	**0.092*****	**0.007*****	**0.007*****	**-0.024**	**-0.012**	**0.011**
	[1.50]	**[1.51]**	**[1.61]**	**[1.64]**	**[2.21]**	**[2.33]**	**[2.43]**	**[2.89]**	**[2.90]**	**[4.77]**	**[0.85]**	**[0.67]**	**[0.96]**
Foreign Stock (Y/N)	1.005	0.701	1.735	1.257	0.069***	0.064***	0.113**	0.154***	0.001	0.005**	-0.031	-0.01	0
	[1.27]	[1.18]	[1.63]	[1.56]	[3.15]	[2.94]	[2.22]	[3.31]	[0.44]	[2.48]	[1.30]	[0.71]	[0.04]
Daily Trading Volume (x 1000 shares)	0.000	0.000	0.000*	0.000*	0.000*	0	0.000*	0.000*	0.000**	0.000**	0.000**	0.000**	0.000**
	[1.48]	[1.49]	[1.85]	[1.77]	[1.91]	[1.53]	[1.94]	[1.93]	[2.48]	[2.35]	[2.26]	[2.23]	[2.15]
Market Capitalization (Billion)	-7.819***	-5.419***	-12.503***	-7.671***	-0.362**	-0.246*	-1.865***	-1.674***	-0.197***	-0.162***	-1.118***	-0.751***	-0.544***
	[3.07]	[3.22]	[3.03]	[2.85]	[2.05]	[1.84]	[3.82]	[3.24]	[5.97]	[6.03]	[3.76]	[3.74]	[4.34]
log (1+ % Institutional Ownership)	0.294	0.195	0.185	0.116	-0.009	-0.007	-0.048***	-0.040**	0.000	0.000	-0.020**	-0.010**	-0.006**
	[1.26]	[1.18]	[0.61]	[0.53]	[1.13]	[1.06]	[2.72]	[2.33]	[0.11]	[0.70]	[2.50]	[2.33]	[1.99]
log(1+ % Insider Ownership)	0.676*	0.439	1.227**	0.808**	0.02	0.013	0.003	-0.004	0.001	0.001*	0.006	0.003	0.008*
	[1.75]	[1.61]	[2.42]	[2.21]	[1.53]	[1.37]	[0.32]	[0.43]	[1.61]	[1.72]	[0.89]	[0.59]	[1.77]
NYSE Stock (Y/N)	0.798*	0.474*	0.950*	0.715**	-0.014	-0.012	0.002	-0.004	-0.008**	-0.004	0.042	0.015	-0.007
	[1.93]	[1.93]	[1.65]	[2.21]	[0.58]	[0.54]	[0.05]	[0.12]	[2.19]	[1.60]	[1.24]	[0.82]	[0.61]
NASDAQ Stock (Y/N)	0	-0.194	0	-0.259	0	-0.057**	0	-0.041	0	-0.001	0	0.027	0
	[.]	[0.63]	[.]	[0.55]	[.]	[2.37]	[.]	[1.18]	[.]	[0.18]	[.]	[0.87]	[.]
Observations	26689	44204	27379	45252	27379	45252	27379	45252	25654	42632	27379	45252	27379
R-squared	0.11	0.11	0.09	0.09	0.1	0.1	0.12	0.06	0.49	0.52	0.07	0.07	0.1

Robust t statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8. Market Quality Pre-Emergency Order and Short Sales

Regression of measures of market quality on stock chacteristics. Volatility (Close-to-Close) is the square of daily returns from closing to next day closing. Volatility (Open-to-Close) is th square of daily returns from opening to closing. Quoted spread is the bid-ask difference. Relative Spread is the bid-ask difference relative to the bid-ask midpoint. Turnover by volume is trading volume relative to total number of listed shares (for non-US stocks it also includes shares in domestic market). Negative (Positive) semivariance is the mean square deviations of returns conditional on returns being negative (positive). The sample includes observations from July 1st, 2006, to July 15th, 2008. The regression is estimated with time fixed effects. Standard errors are robust, and clustered by firm.

	G19 Stocks			US Financial Institutions			Difference G19 - US Financial Stocks					
	Pre-Emergency Order	Post-Emergency Order	Difference	Pre-Emergency Order	Post-Emergency Order	Difference	Pre-Emergency Order			Post-Emergency Order		
Volatility (Open to Close)	168.81%	327.04%	158.23% ***	123.65%	203.33%	79.68% **	45.15%		(0.6872)	123.71%		(0.7217)
Volatility (Close to Close)	216.18%	404.67%	188.49% ***	93.65%	264.02%	170.37% ***	122.53%		(0.3318)	140.65%		(0.6202)
Quoted Spread	$0.08	$0.12	4.32% ***	$0.04	$0.06	$0.02 *	$0.03	**	(0.0106)	$0.06	***	(0.0005)
Relative Quoted Spread	17.48%	48.43%	30.94% ***	11.17%	28.53%	17.36% **	6.31%	***	(0.0011)	19.90%	***	(0.0002)
Trade Price Range	2.74%	7.11%	4.37% ***	2.79%	6.99%	4.20% ***	-0.06%		(0.9871)	0.12%		(0.9871)
Turnover by Volume - Daily	7.31%	26.15%	18.84% ***	10.02%	28.27%	18.26% *	-2.71%		(0.1178)	-2.12%		(0.1634)
Negative Semi-Variance	3.77%	20.39%	16.62% ***	4.04%	10.66%	6.62% **	-0.27%		(0.2274)	9.72%		(0.6094)
Positive Semi-Variance	2.99%	26.68%	23.69% ***	2.68%	28.73%	26.05% ***	0.31%		0.099123	-2.04%		0.926001

	Non-US Financial Institutions			Difference G19 - Non-US Financial Stocks					
	Pre-Emergency Order	Post-Emergency Order	Difference	Pre-Emergency Order			Post-Emergency Order		
Volatility (Open to Close)	64.34%	134.94%	70.60% ***	104.47%	**	(0.0208)	192.10%	*	(0.0694)
Volatility (Close to Close)	125.52%	246.39%	120.87% ***	90.66%		(0.1408)	158.28%	*	(0.0882)
Quoted Spread	$0.13	$0.14	$0.02 *	-$0.05		(0.4765)	-$0.02		(0.1698)
Relative Quoted Spread	40.49%	46.01%	5.52%	-23.01%	***	(0.0002)	2.42%		(0.1991)
Trade Price Range	2.39%	3.92%	1.53% **	0.34%	*	(0.0992)	3.19%	***	(0.0027)
Turnover by Volume - Daily	2.02%	2.19%	0.17% ***	5.29%	***	(0.0070)	23.96%	***	(0.0065)
Negative Semi-Variance	3.07%	5.23%	2.17% *	0.70%		(0.4765)	15.15%		(0.1991)
Positive Semi-Variance	2.84%	8.25%	5.41% **	0.15%		0.374768	18.43%		0.003009

Table 9. Market Quality and the Emergency Order

Measures of Market Quality before and after July 21h, 2008. Volatility (Close-to-Close) is the square of daily returns from closing to next day closing. Volatility (Open-to-Close) is th square of daily returns from opening to closing. Quoted spread is the bid-ask difference. Relative Spread is the bid-ask difference relative to the bid-ask midpoint. Turnover by volume is trading volume relative to total number of listed shares (for non-US stocks it also includes shares in domestic market). Negative (Positive) semivariance is the mean square deviations of returns conditional on returns being negative (positive). The sample includes observations from July 1st, 2006, to August 8th, 2008.

	Volatility (Open to Close)	Volatility (Close to Close)	Quoted Spread	Relative Quoted Spread	Trade Price Range	Negative Semi-Variance	Positive Semi-Variance
Constant	-0.082	-0.501	0.019*	0.050*	0.015***	0.010	0.005
	[0.33]	[1.51]	[1.82]	[1.70]	[12.40]	[1.35]	[1.00]
G19 Stock (Y/N)	**-0.301**	**-0.805**	**-0.007**	**0.079**	**-0.001**	**-0.018**	**-0.002**
	[0.63]	**[1.27]**	**[0.34]**	**[1.41]**	**[0.44]**	**[1.58]**	**[0.21]**
Post-Emergency Order (Y/N)	0.638***	0.875***	0.007*	0.108***	0.030***	-0.029**	0.202***
	[4.66]	[4.08]	[1.96]	[5.79]	[45.20]	[2.20]	[22.01]
G19 Stock x Post-Emergency Order	**0.203**	**-0.32**	**0.033*** **	**0.085** **	**-0.015*** **	**-0.007**	**-0.085*** **
	[0.77]	**[0.77]**	**[4.68]**	**[2.34]**	**[12.03]**	**[0.25]**	**[4.79]**
Non-US Stock (Y/N)	0.15	0.757	0.086***	0.320***	0.007***	0.025***	0.026***
	[0.41]	[1.57]	[5.45]	[7.54]	[3.96]	[2.94]	[4.98]
Non-US Stock x Post-Emergency Order	-0.011	0.221	-0.004	-0.034	-0.017***	0.046**	-0.151***
	[0.05]	[0.65]	[0.72]	[1.16]	[16.11]	[2.20]	[10.35]
Daily Trading Volume (x 1000 shares)	0.048***	0.079***	0.001***	0.004***	0.001***	0.008***	0.005***
	[24.74]	[25.51]	[14.94]	[16.45]	[114.38]	[45.36]	[41.18]
Market Capitalization (Billion)	14.316***	27.816***	0.448***	-0.443**	-0.039***	-0.406***	-0.289***
	[9.03]	[11.31]	[10.11]	[2.07]	[4.89]	[4.92]	[5.57]
log (1+ % Institutional Ownership)	0.059***	0.048*	0.003***	0.013***	0.002***	0	0.000
	[3.30]	[1.67]	[7.26]	[5.43]	[21.73]	[0.02]	[0.08]
log(1+ % Insider Ownership)	0.112***	0.199***	-0.002*	0.004	0.000**	0.005*	0.008***
	[3.15]	[3.60]	[1.87]	[0.86]	[2.00]	[1.68]	[4.35]
NYSE Stock (Y/N)	-0.131	-0.23	0.001	0.004	0	-0.003	-0.020***
	[1.40]	[1.56]	[0.33]	[0.33]	[0.53]	[0.37]	[3.11]
NASDAQ Stock (Y/N)	-0.15	-0.081	-0.001	-0.007	0.002	0.023	-0.024
	[0.54]	[0.18]	[0.20]	[0.19]	[1.61]	[0.82]	[1.28]
Observations	53,173	54,341	54,345	54,345	51,387	54,341	54,345
R-squared total	98.00	98.00	98.00	98.00	94.00	98.00	98.00
Absolute value of z statistics in brackets	0	0	0.03	0.04	0.29	0.04	0.05

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 10. Regression Analysis: Market Quality and the Emergency Order

Regression of measures of Market Quality before and after July 21th, 2008 on stock characteristics. Volatility (Close-to-Close) is the square of daily returns from closing to next day closing. Volatility (Open-to-Close) is th square of daily returns from opening to closing. Quoted spread is the bid-ask difference. Relative Spread is the bid-ask difference relative to the bid-ask midpoint. Turnover by volume is trading volume relative to total number of listed shares (for non-US stocks it also includes shares in domestic market). Negative (Positive) semivariance is the mean square deviations of returns conditional on returns being negative (positive). The sample includes observations from July 1st, 2006, to July 31st, 2008. The regression is estimated with firm-random fixed effects.

	G19 Stocks			US Financial Institutions			Non-US Financial Institutions		
	Pre-Emergency Order	Post-Emergency Order	Absolute Difference	Pre-Emergency Order	Post-Emergency Order	Absolute Difference	Pre-Emergency Order	Post-Emergency Order	Absolute Difference
Cross-Autocorrelation	8.24%	-24.14%	32.38%	0.95%	-25.77%	26.72%	-8.67%	-14.48%	5.81%
R-Squared	32.22%	43.77%	11.55%	22.46%	33.28%	10.82%	30.20%	33.52%	3.31%
Upside Cross-Autocorrelation	29.08%	37.18%	8.10%	20.92%	46.40%	25.49%	15.22%	25.58%	10.36%
Downside Cross-Autocorrelation	-1.61%	1.65%	3.26%	-1.79%	-5.84%	4.05%	-7.93%	-5.14%	2.78%
Upside R-Squared	27.90%	17.89%	10.02%	21.70%	23.58%	1.89%	22.29%	19.38%	2.91%
Downside R-Squared	21.94%	48.63%	26.69%	11.78%	12.53%	0.75%	18.02%	28.11%	10.09%

Table 11. The July Emergency Order and Measures of Market Efficiency – Up to August 8, 2008

We group stocks into six groups, depending on whether the stock is in the base sample, the control group of US financial institutions, or the control group of non-US financial institutions; and for two time periods, pre- and post-July 21st. We calculate the R-squared in two modified market regressions for each group, of individual stock returns on the domestic market index, where we use only either positive or negative market returns. We then compute the corresponding adjusted R-squared coefficients, upside R-squared, and downside R-squared. Each regression is estimated with firm-fixed effects. We compute cross-autocorrelations between one-day lagged market returns and individual stock returns. In particular, we calculate $\rho^{+}_{ijTD} = corr(r_{ijt}, r^{+}_{mjt-1})$ and $\rho^{-}_{ijTD} = corr(r_{ijt}, r^{-}_{mjt-1})$, where r^{+}_{mt} equals the market return when it is either positive or zero, and r^{-}_{mt} equals the market return when it is negative for all stocks i in each group. We then average the cross-autocorrelations across groups.

	N	Cumulative Abnormal Return Jun 1 - July 14		Cumulative Abnormal Return July 15-July 20		Cumulative Abnormal Return July 20 - Aug 8		Abnormal Return July 15th		Abnormal Return July 21st	
G19	19	-12.34% *	(0.0657)	12.42% ***	(0.0001)	-4.57%	(0.2829)	-4.09%	(0.1216)	-0.05%	(0.9477)
US Financial Stocks	59	-10.82% ***	(0.0007)	10.09% ***	(0.0000)	5.68% **	(0.0300)	0.16%	(0.8581)	-1.58% ***	(0.0004)
non-US Financial Stocks	73	-3.56% ***	(0.0047)	1.10% **	(0.0189)	-0.79%	(0.5114)	-1.60% ***	(0.0000)	1.46% **	(0.0208)
Total Sample	144	-7.04% ***	(0.0000)	5.46% ***	(0.0000)	0.78%	(0.5199)	-1.27% *	(0.0609)	-0.25%	(0.4779)
Difference G19 - US Financial Stocks		-1.52%	(0.8456)	2.33%	(0.2301)	-10.25% **	(0.0131)	-4.25%	(0.4834)	1.53% **	(0.0488)
Difference G19 - non US Financial Stocks		-8.79%	(0.4493)	11.33% ***	(0.0000)	-3.78%	(0.3298)	-2.49%	(0.9999)	-1.51%	(0.2831)

Table 12. Cumulative Abnormal Returns around the July 15th Emergency Order

We estimate by firm a market model regression of individual stock returns on market returns in the period March 1, 2008 to May 31, 2008, and use the estimated coefficients to calculate abnormal returns in the period July 1st to August 8th, 2008. Tests of differences are based on a non-parametric Wilcoxon test

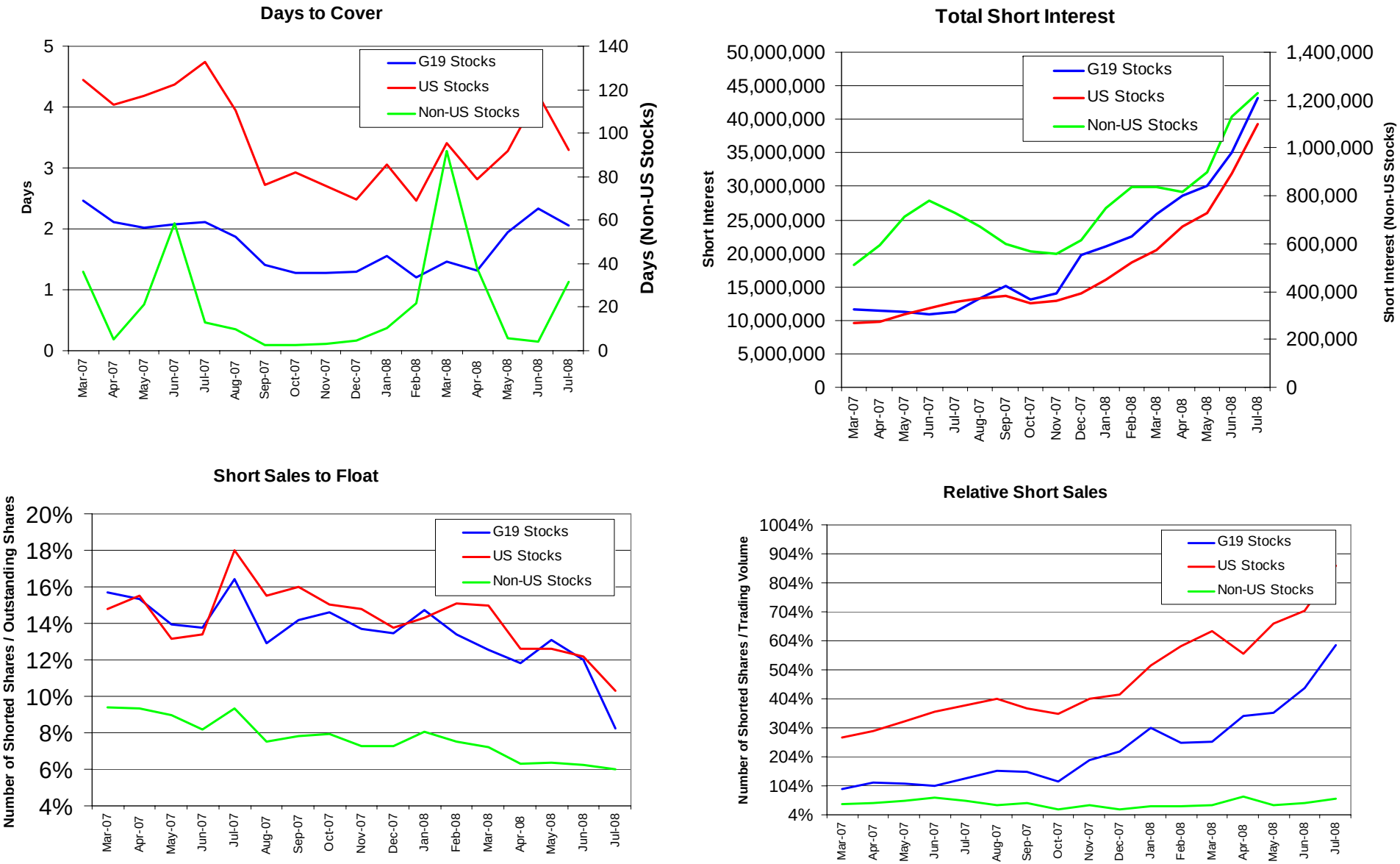
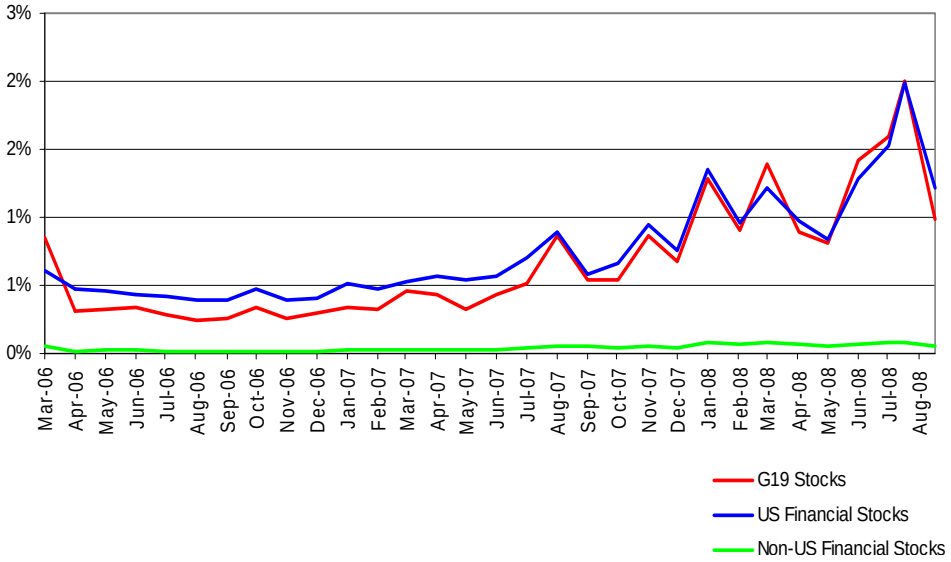


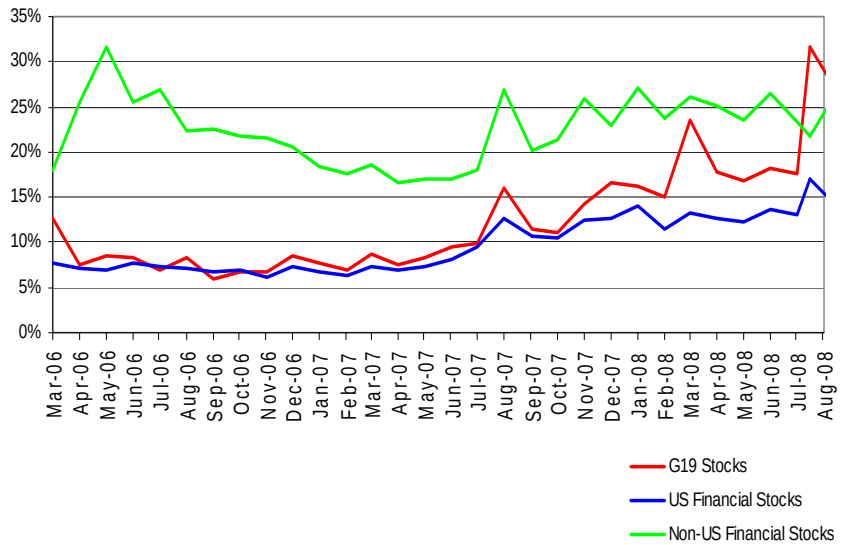
Figure 1. Short Selling Activity in the Base and Control Samples, before July 2008

Measures of short-selling activity for the stocks in the total sample. Shorted Shares to Float - Daily are computed every day as the number of shares shorted in the day, divided by the number of shares outstanding, averaged out across stocks, and accumulated every month. Shorted Shares to Float -Monthly are computed as the total number of shares sold short in a month, divided by the float, for each stock, and then averaged across months. Relative Short Sales – Daily is the number of shares sold short relative to the daily trading volume, averaged across firms and months and multiplied times the number of trading days in the month. Relative Short Sales – Monthly is the total number of shares sold short in a month for each firm, relative to the monthly trading volume, averaged across firms. Short Sale data is from NYSE and Nasdaq. The sample includes observations from July 1st, 2006, to June 30th, 2008.

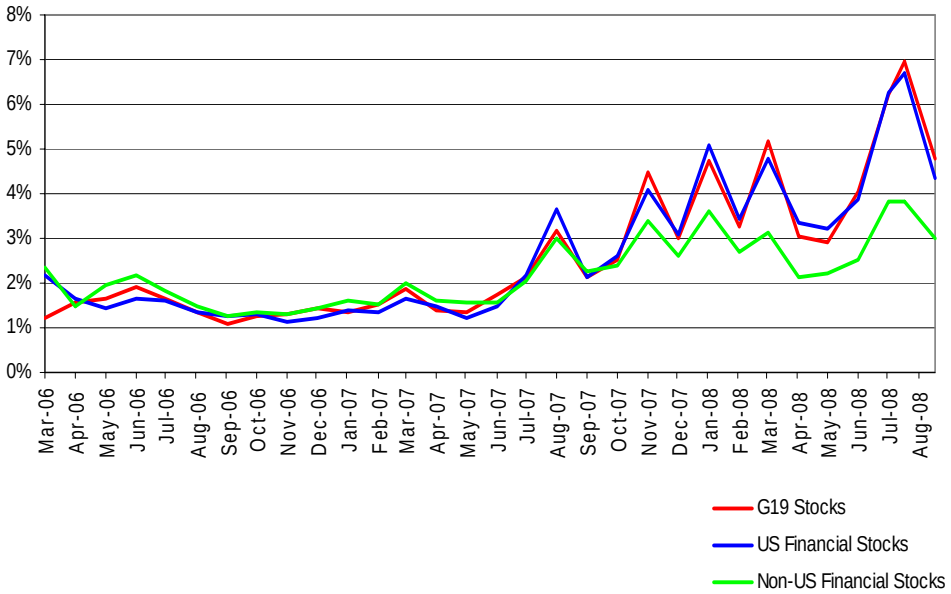
Turnover by Volume



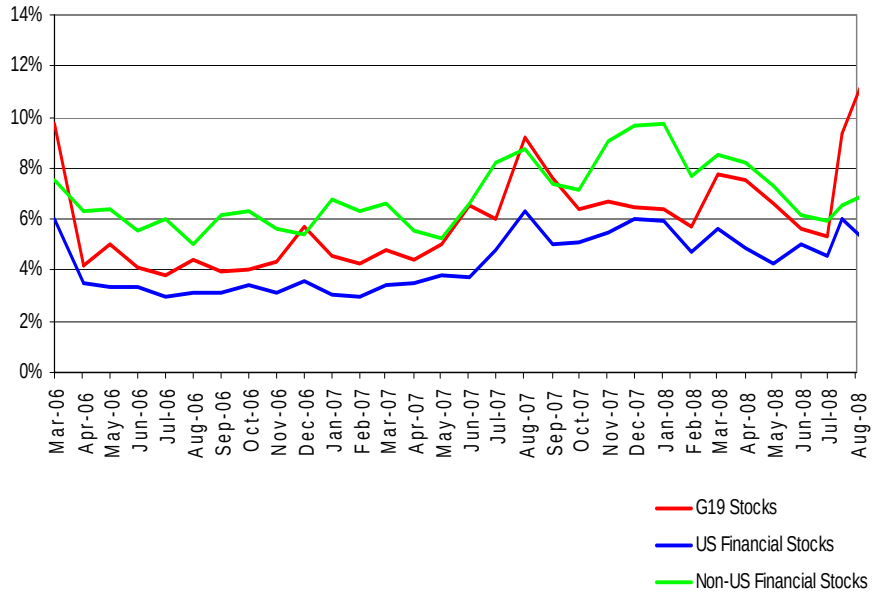
Relative Spread

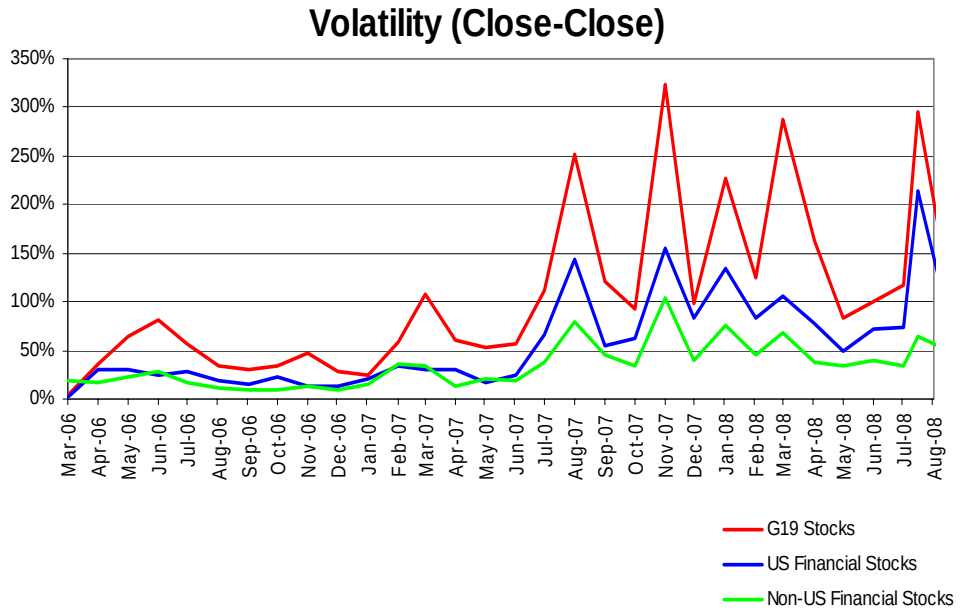


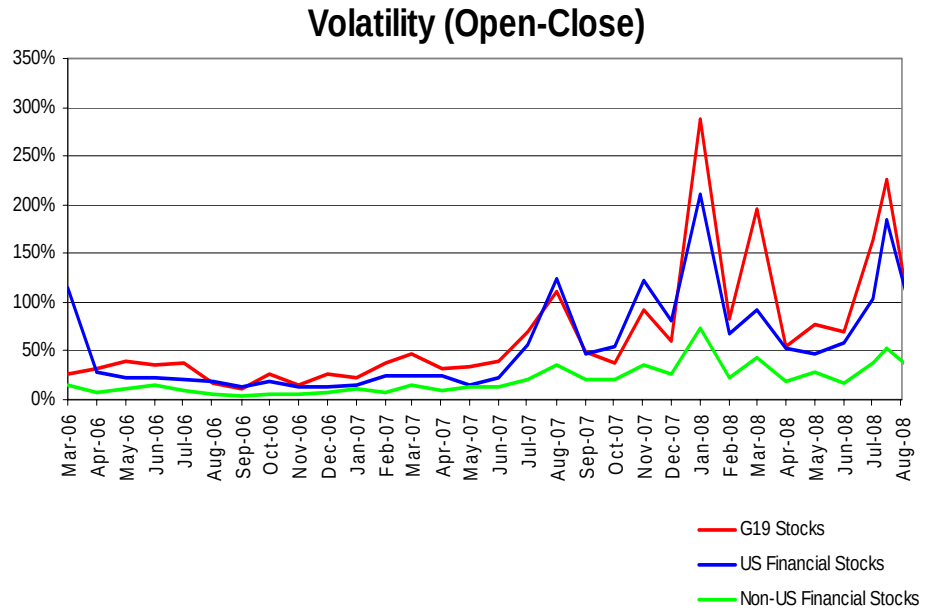
Trade Range

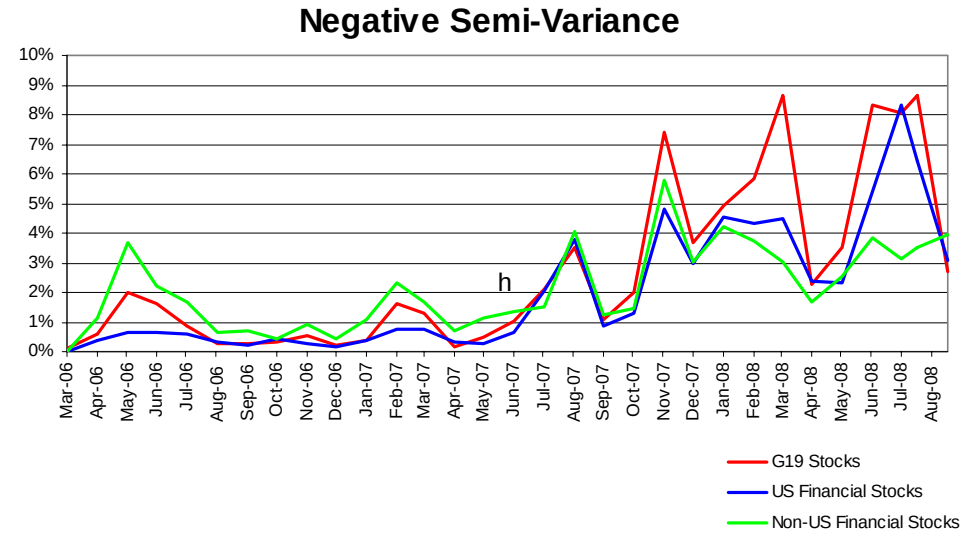


Effective Spread









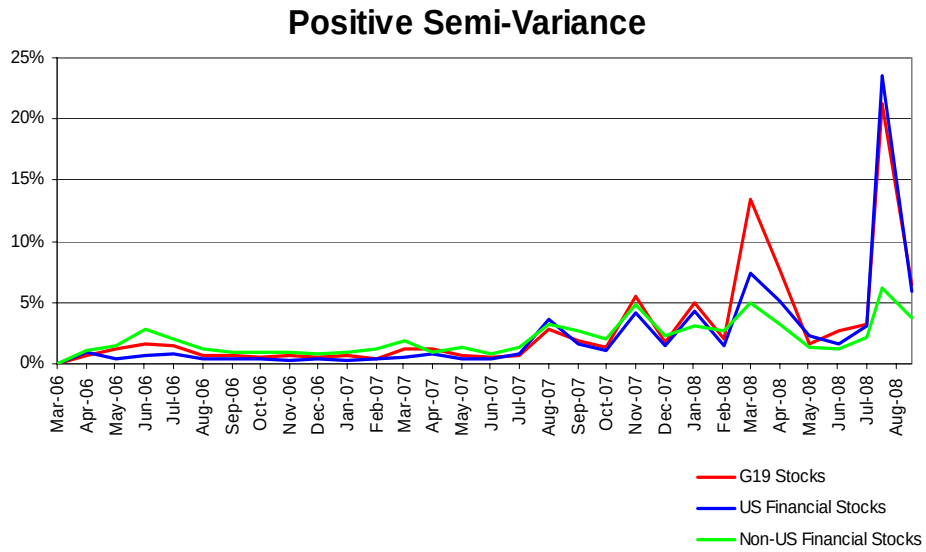


Figure 2. Market Quality Pre- and Post-Emergency Order

Measures of market quality around August 21, 2008. Volatility (Close-to-Close) is the square of daily returns from closing to next day closing. Volatility (Open-to-Close) is th square of daily returns from opening to closing. Quoted spread is the bid-ask difference. Relative Spread is the bid-ask difference relative to the bid-ask midpoint. Turnover by volume is trading volume relative to total number of listed shares (for non-US stocks it also includes shares in domestic market). Negative (Positive) semivariance is the mean square deviations of returns conditional on returns being negative (positive). The sample includes observations from July 1st, 2006, to July 15th, 2008. The regression is estimated with time fixed effects. Standard errors are robust, and clustered by firm.

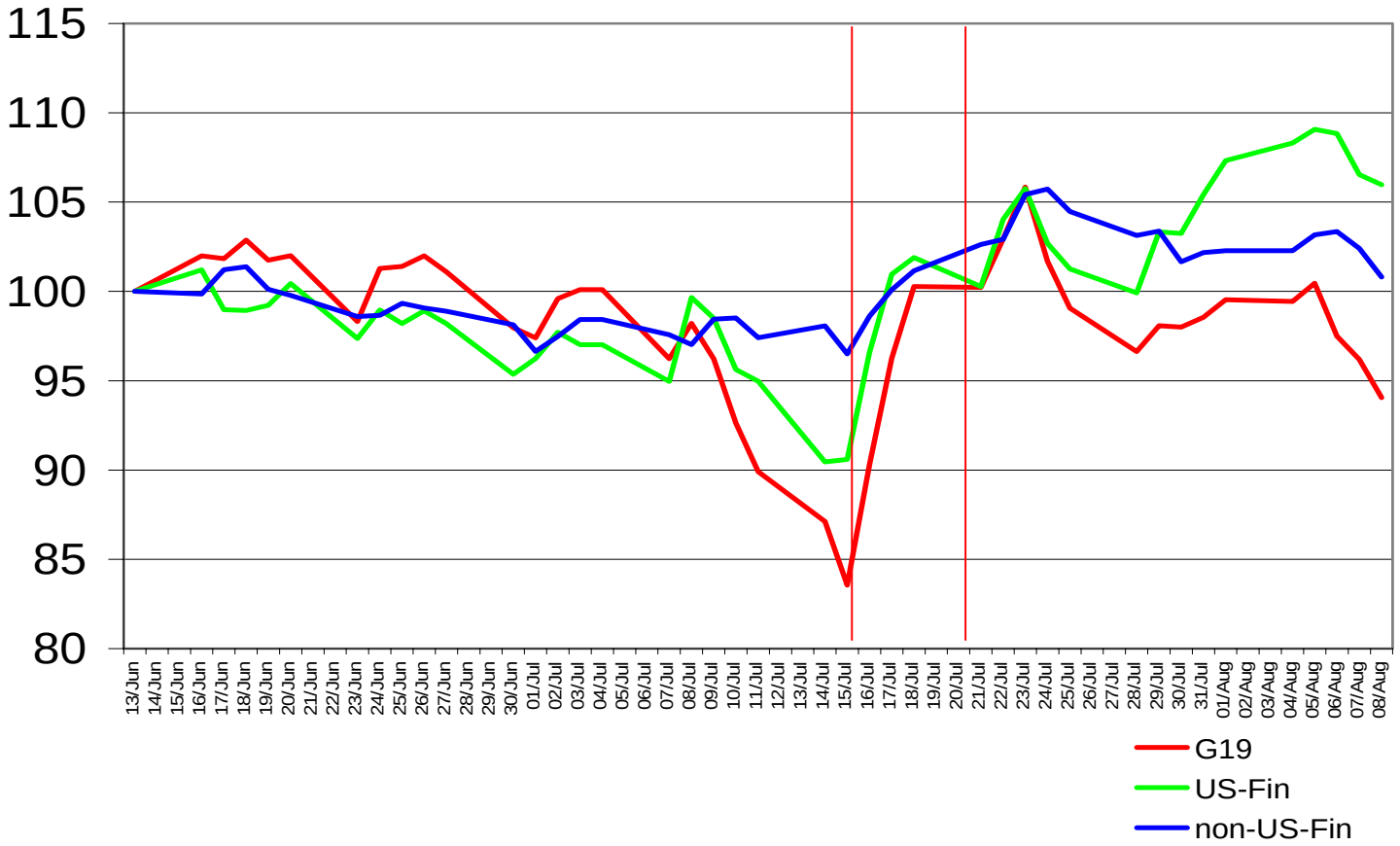


Figure 3. Cumulative Abnormal Returns around the July 15th Emergency Order

We estimate by firm a market model regression of individual stock returns on market returns in the period March 1, 2008 to May 31, 2008, and use the estimated coefficients to calculate abnormal returns in the period July 1st to August 8th, 2008. Tests of differences are based on a non-parametric Wilcoxon test