The Investigation of a Short Sell Ban in a Selected Market

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The hypothesis of overvaluation argues that short sell restrictions are reflected in security prices by their over valuation. In the situation when short sell is prohibited or expansive pessimistic investors expectation are not reflected in security prices. In the paper is examine impact of short sell ban in the price of banking and other financial institution stocks in France in the period Aug 11 2011 to Feb 13 2012. According to ARs and CARs the hypothesis of over valuation is not confirmed getting mixed results based on the market model and the adjusted market model as well.

JEL Codes: F34, G21 and G24

1. Introduction

Short sell is old market practice that allowed market subjects to participate in increasing market prices by short selling over-valuated securities. Short sellers have been blamed for stock market declines and thus market participants called for short sell regulations for several times. Their voices were stronger in the period after a market crash. Napoleon Bonaparte reportedly once called short sellers "enemies of the state." (Reuters, 2008). The history of short sale or short selling is associated with Dutch businessman Isaac Le Maire and East India Company (Vereenigde Oostindische Compagnie). In 1609 was formed the secret association called Groote Companie to short the share of East India Company in anticipation of the incorporation of a French-chartered trading firm. The secret association sold shares forward with the promise of future delivery in the time period 1 – 2 years. During 12 months the shares of East India Company dropped by 12 percentage. (Bris, Goetzmann, Zhu, 2007) It led to the first regulation over the short selling in 1610.

One hundred year later in 1720, the France and England also imposed some short sell limitations. In France is mentioned the over-speculation with shares of Mississippi Company (Mississippi bubble). The shares of this company increased from 500 livres in May 1719 to 10.000 livres in Feb 1720 and subsequently dropped again to 500 livres. Short sellers were blamed for this market crash and short sell was temporarily banned. Napolen Bonaparte considered that short sell activities were main reason why he failed in hit attempt to raising capital for war financing. Thus, during his governance the short sell was banned and considered to be treasonous activity. (Gregoriou, 2012).

In the England the activities of short sellers are mentioned in market crash in 1720's with the South See Bubble. Although the short sellers were not primary responsible for market crash the further market regulation let to short sell ban in 1733 (but some sources said that only naked short selling was banned).(Elul, 2009), (Gregoriou, 2012).

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In the U.S. the short sell was limited during the 19th and the beginning of the 20th century. NYSE banned short sell in the period 1812 – 1858. In 1917 NYSE restricted short sell by impose of disclosures about short interest with market subject identification. In 1929 short sellers are blamed for participation to NYSE crash. (Elul, 2009). There are mentioned activities of so called bear raiders that spread negative information to deepen downward price spiral. That led to several years of Congress hearings when FED was powered e.g. about margin requirements or short sell limited of prohibited rule called uptick rule were adopted. The U.S. legal framework restricted short sell that was prepared after 1920's economic crises existed (with slight changes) till 21st century. In 2004 the new short sell regulation called Regulation SHO was adopted.

Situation in the EU countries is not unitary, short sell was a market practice without any specific regulation, EU countries limited short sell very often in rules against market abuse or disclosure requirements.

In the 21st century temporary short sell bans become applied by market regulators to limited strong downward of the market of some sector stocks especially after Lehman Brothers collapse, particular countries banned short sell with some sector stocks for several periods, with average duration of short sell ban was 250 days.

Repeated short sell ban was adopted in 2008 in four EU countries. On August 2011 Belgium, France, Italy and Spain banned short sell with selected financial sector stocks. This ban (at first only for 15 days) was prolonged for several time and continued till February 2012 when was lifted. It was a response to speculative attack and sharp decline in stock prices. The short sell practice was traditionally blamed for increasing market instability.

The aim of the paper is investigate short selling respectively short sell ban on particular stock prices. Because short sell with financial stocks was prohibit in France from 11th August to 13th February (and in Belgium, Italy and Span as well) we can obtain a test group and we can test impact of the short sell respectively the short sell ban in the prices of selected financial stocks.

2. Literature Review

One of the first to argue that restricting short-sales can lead to overvaluation of securities was Edward M. Miller (Elul, 2009). Miller (1977) argue that in the period of short sell restrictions securities tend to be over valuated because reflect more information of positive investors than the average opinion. In that situation short sells are prohibited or expansive thus investor with negative expectation are not trading to push prices back to fundamental and bids of optimistic investor push the security prices up.

Bris, Goetymann and Yhu (2007) analyse information from 46 equity markets to find out weather short sell restrictions affect the efficiency of the market. They find some evidence that reflect negative information faster in the countries where short sell is practised or allowed.

Jones, Lamont (2002) examine cost of short selling in the period 1926 – 1933 and find out that stocks that are expensive for short sell are highly valuated and record low

subsequent return. That is consistent with over valuation hypothesis. Aitken, Corry, Frino and Swan (1998) investigate market reaction to short sell on the intraday basin and find only slight reaction. Angel, Christopher and Ferri (2003) investigated short selling on Nasdaq and find that days of high short selling in a stock typically precede days of significantly negative market-adjusted return.

Chang, Chen and Yu (2007) examine the effect of short sell restrictions on price discovery on the Hong Kong market. They figure out that if a stock is designed for a short sell list the stock return is associated with statistically significant post event decline in cumulative abnormal return.

Zhou, Wong (2012) investigate the impact of short selling on China stock prices after approving short sell in China. They find that in the short run stocks allowed for short selling tend to have worse performance than those not allowed for short selling. This tends to support the argument that short selling provides a tool for informed investors to correct overpricing

3. The Methodology and Model

On April 11 France banned short sell with 10 stocks of banks and other financial institutions: April Group, Axa, BNP Paribas, CIC, CNP Assurances, Crédit Agricole, Euler Hermès, Natixis, Scor, Société Générale that took till 13th February 2012. Thus, in our analysis the 13th February is considered to be event day.

For the analysis of impact short sell respectively short sell ban was applied a standard methodology for event study. (Zhou, Wong, 2012), (Chang, Cheng, Wu, 2007)

To test overvaluation hypothesis are compared stock prices before and after event day.
We apply the measure of abnormal return (AR) and cumulative abnormal return (CAR) around event day.
We use two forms of AR and CAR measure, so called market model and adjusted market model. (Chang, Cheng, Wu, 2007)

Market model

It is base on ordinary least square model (OLS), defined as:

$$AR_{i(t)} = R_{i(t)} - \left(\hat{\alpha} - \hat{\beta} \cdot R_{M(t)} \right),$$

where $R_{i(t)}$ is return of stock i at date t, $R_{M(t)}$ is return of the market represented by market index, t is from interval $(-131,96)$, where 0 represent event date, the day when short sell ban was lifted. Coefficients $\hat{\alpha}$ and $\hat{\beta}$ (intercept and slope coefficients) are estimated from linear regression equation:

$$R_{i(h)} = \hat{\alpha} + \hat{\beta} \cdot R_{M(h)} + \varepsilon_{i(h)},$$

where variables are same as above and h comes from interval $(-131,0)$
and

$$CAR_{i,(t1,t2)} = \sum_{t=t1}^{t2} R_{i(t)} - \left(\hat{\alpha} - \hat{\beta} \cdot R_{M(t)}\right),$$

where $CAR_{i,(t1,t2)}$ is cumulative abnormal return before and after event. In the paper was applied 228-day estimation window.

Market adjusted model

It is defines as:

$$AR_{i(t)} = R_{i(t)} - R_{M(t)},$$

and

$$CAR_{i,(t1,t2)} = \sum_{t=t1}^{t2} R_{i(t)} - R_{M(t)},$$

Where $AR_{i(t)}$ is defined as the difference between security return in date *t* and market return in date *t*. and *CAR* is defined as a cumulative abnormal return during examined period (before and after event period).

Hypotheses:

H0: Stock prices will be decreased when short sell ban is lifted.

That is the hypothesis of the over valuation, thus there should be abnormal positive return during the period with short sell restrictions because the stock prices do not reflect all relevant information and mostly only positive ones and then when short sell restriction repeals we can expect abnormal negative return as a reaction to security price returns to fundamentals. The CAR should be decreasing after the period after the event day and the chart of the CAR should become flatter if stock prices are closer to fundamentals.

In the period from Aug 11 2011 to Feb 13 2012 France market regulator banned short sale with 10 banks and other financial institution stocks. From these 10 stocks were 6 stocks were grouped as the "test group". The market index CAC 40 was chosen as a proxy for France stock market.

Table 1: The list of analysed companies

Test group	Company name	Market capitalization mln. EUR	Beta coefficient
	April Group	459,7	1,02325
	AXA	21.664,7	1,86
	CNP Assurances	4.580,9	1,030
	Credit Agricole	7.588,9	1,73
	BNP Paribas	33.794,23	1,46
	Societe Generale	12.203,08	1,25

4. The Findings

Estimation results for each day of the week from the full sample are reported in Tab. 2 and Tab. 3. The data set contains 10 trading days before the lift of short sell ban, and 10 days after short sell ban was lifted.

Table 2: Abnormal Returns Around the Event Day

	Abnormal Returns Around the Event Day					
	Market Model			Adjusted Market Model		
Day	AR	t-statistic	p-value	AR	t-statistic	p-value
-10	-0,046***	-4,183	0,009	0,027***	-5,007	0,004
-9	0,003	0,451	0,671	0,019	-1,832	0,126479
-8	0,050***	7,519	0,001	0,016***	7,281	0,001
-7	0,012	1,685	0,153	0,019	-0,010	0,995
-6	0,032**	3,220	0,023	0,024**	3,920	0,011
-5	-0,001	-1,389	0,224	0,017	-1,500	0,195
-4	0,009	1,712	0,148	0,013	1,965	0,107
-3	0,001	1,894	0,117	0,012	1,431	0,212
-2	0,026**	3,308	0,021	0,020***	5,016	0,004
-1	-0,034**	-2,585	0,049	0,032**	-2,762	0,040
0	-0,012	-1,695	0,151	0,018	-1,216	0,279
1	-0,026**	-3,752	0,013	0,017***	-4,175	0,009
2	0,011	1,493	0,196	0,018	1,485	0,198
3	0,001**	0,118	0,911	0,015	-1,692	0,151
4	0,032**	4,057	0,01	0,019**	3,074	0,028
5	0,014	3,838	0,012	0,009***	4,698	0,005
6	0,001	0,452	0,670	0,009	1,985	0,104
7	-0,019	-1,979	0,105	0,024	-1,887	0,118
8	-0,023**	-3,860	0,012	0,015***	-4,267	0,008
9	0,017	1,783	0,135	0,027	2,551	0,051
10	-0,019***	-4,104	0,009	0,012***	-4,528	0,006

*** Significant at 1% level (one-tailed test)
 ** Significant at 5% level (one-tailed test)

Table 3: Cumulative Abnormal Returns Around the Event Day

	Cumulative Abnormal Returns Around the Event Day					
	Market Model			Adjusted Market Model		
Day	CAR	t-statistic	p-value	CAR	t-statistic	p-value
-10	0,039 ***	-5,485	0,003	0,134	-1,120	0,314
-9	0,035 ***	-5,867	0,002	0,137	-1,357	0,233
-8	0,043	-1,938	0,110	0,138	-0,482	0,650
-7	0,050	-1,054	0,340	0,147	-0,453	0,670
-6	0,061	0,435	0,682	0,155	0,184	0,862
-5	0,047	0,059	0,955	0,150	0,019	0,985
-4	0,044	0,549	0,607	0,150	0,184	0,861
-3	0,041	1,166	0,296	0,141	0,313	0,767
-2	0,045	2,505	0,054	0,139	1,031	0,350
-1	0,017	1,695	0,151	0,131	0,421	0,691
0	0,000	-2,139	0,085	0,136	0,246	0,815
1	0,017 **	-3,752	0,013	0,140	-0,270	0,798
2	0,027	-1,417	0,216	0,148	-0,076	0,942
3	0,035	-1,044	0,344	0,147	-0,249	0,813
4	0,034	1,225	0,275	0,145	0,159	0,880
5	0,031	2,464	0,057	0,143	0,445	0,675
6	0,038	2,106	0,089	0,146	0,552	0,605
7	0,042	0,758	0,483	0,146	0,244	0,817
8	0,047	-0,484	0,649	0,158	-0,188	0,859
9	0,053	0,369	0,727	0,163	0,189	0,858
10	0,054	-0,495	0,642	0,166	-0,129	0,903

*** Significant at 1% level (one-tailed test)
 ** Significant at 5% level (one-tailed test)

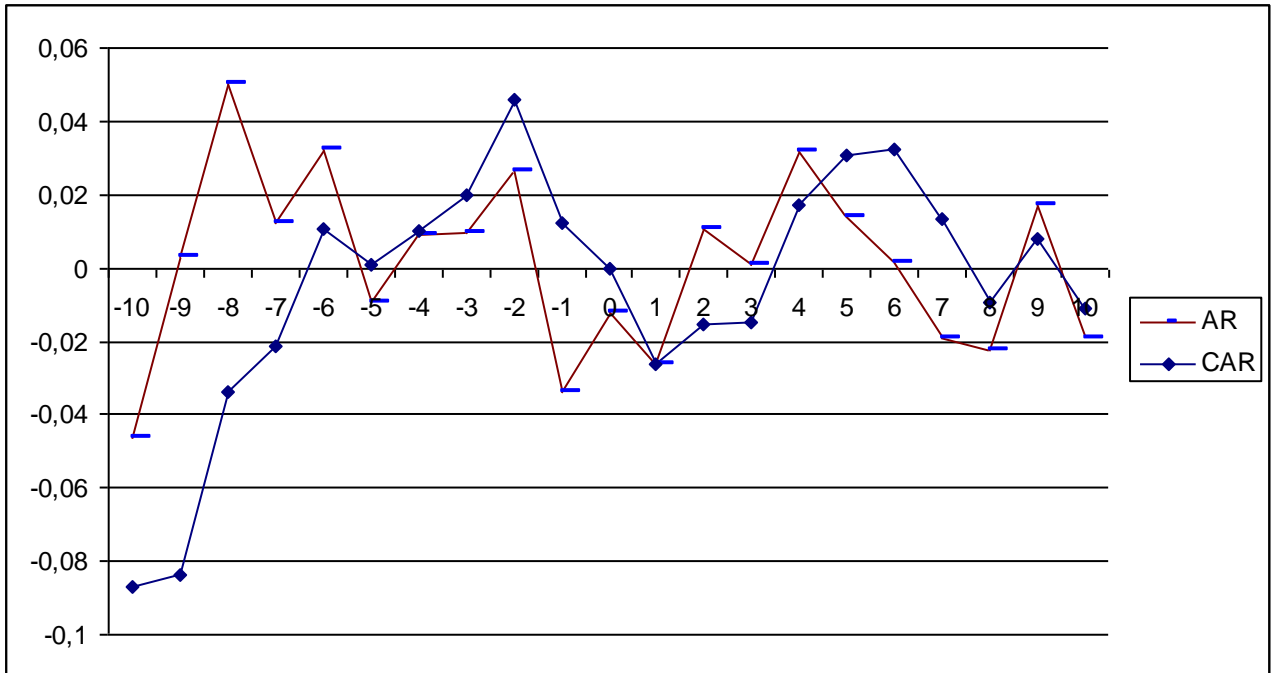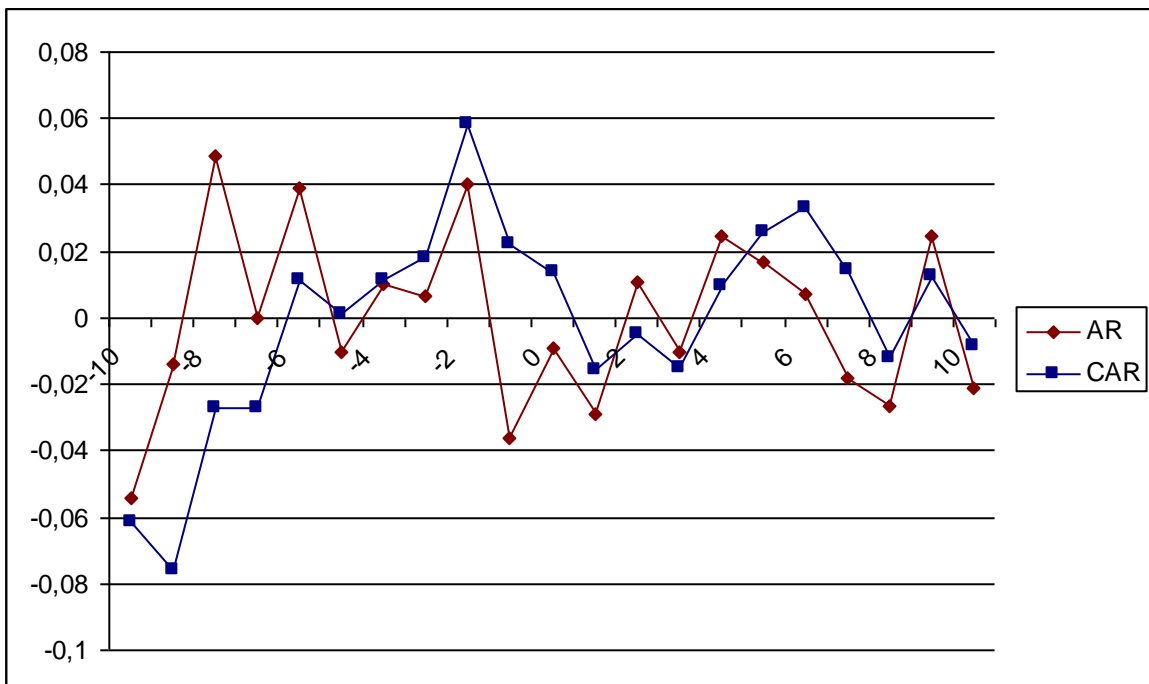## Figure 1: Market Model

Figure 2: Adjusted Market Model

There is no substantial evidence of significant positive means of AR during the period with short sell restrictions and significant negative means of AR after that event.

Table 2 represents 21 daily means of AR, 10 days before and 10 day after the event day, that is represented with day number 0.

The mean of AR on the event day in the market model is -0.012 with p-value 0.151 it means not significantly different from zero. In the adjusted market model again mean of AR on the event day is -1.216 with p-value 0.279 and thus not significantly different from zero at the 5% level.

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In the period before the event day the situation is following. The market model shows that 5 means of AR from 10 are statistically significant, three means of AR are positive. All of them are significant at 1% resp. 10 %. In the market adjusted model all means of AR are positive, 5 of them are statistically significant at level 1% resp. 5 %. These results correspond with the hypothesis of overvaluation.

In the period follows the event day 6 results are positive three of them are statistically significant. In the adjusted market model all means of AR are positive and 5 of them statistically significant that is against the over valuation hypothesis.

In the Table 3 are summarized means of CAR during 21 trading days before and after the event day.

The mean CARs of the market model are only statistically significant for $t=$ -10 (0.039 p-value 0.03) and $t=$ -9 (0,035, p-value -0.09). After the event day statistically significant result is only on $t=$ -1 (0.017, p-value 0.013).

The findings from the adjusted market model are not statistically significant in showed period.

Thus, results based on the market model and the adjusted market model do not support the hypothesis of over valuation. Results based on the market-adjusted model are weaker than the results based on the market model. But neither of them supports the hypothesis that short-sales constraints result in overvaluation in the examined market and if restrictions are removed stock prices are decreasing returning to is fundamentals.

Figure 1 and Figure 2 provide a view of the development in cumulative mean abnormal returns by plotting mean ARs and CARs based on the both model from day −10 through day 10. There is no observable trend in development of CAR based on both models.

The development of CARs do not support the hypothesis of overvaluation in the period of short sell restrictions and the return of stock prices to fundamentals when short sell constraints repeal.

5. Summary and Conclusions

In this paper the effect of short selling ban in stock process was examined. As a represent market was chosen the France capital market where the market regulatory authority imposed short sell ban to stocks of particular bank and other financial institution companies. The ban was in the period from 11th August 2011 to 13th February 2012 that represents 132 trading days. In the paper was examined the idea that during short sell restrictions the stock prices tend to be over valuated because not all negative information are reflected in a stock price. And the idea that after the short sell ban lifting prices will tend to its fundamental value because short sell is used by informed investors. The results are inverse and against the hypothesis of overvaluation. In the examination were used market model and adjusted market model. Finding from market model are mixed. It the period with short sell ban we expected statistically significant positive results but there are both positive and negative. In the period without short sell restrictions were obtained negative findings

reflect the situation the return stock prices to fundaments but the results are mixed as well. Findings after the event day based on the adjusted market models are against the over valuation with only positive results. Five of them are statistically significant. The means of CAR of both models do not confirm the hypothesis and do not show any trend in the development after the event day.

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