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DO STRESS TESTS MATTER? AN EVENT STUDY ON THE IMPACT OF THE DISCLOSURE OF STRESS TESTS RESULTS ON EUROPEAN FINANCIAL STOCKS

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Do stress tests matter?
An event study on the impact of the disclosure of stress tests results on European financial stocks

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ABSTRACT

We evaluate the informational content conveyed in the publication of the results of two stress test exercises conducted by the European Banking Authority in 2010 and 2011 on a sample of European banks in order to gauge their capital needs, Tier-1 ratios and ratios of resilience to adverse shocks, including scenarios of devaluation of their assets. We find a significant impact of the disclosure of the stress tests results on stock prices. The stocks of stress-tested banks (and in particular, stocks of banks that clearly passed the tests) exhibit higher cumulative abnormal returns than other financial stocks, indicating that the information contained in the results of these tests is price sensitive. However, there is no evidence that the stocks of banks that clearly passed the tests obtained higher cumulative abnormal returns than those stocks that barely passed the tests.

In terms of volatility, there are apparently different conclusions to be drawn from the two stress test exercises. In 2010 there was a reduction in volatility following the publication of results, but in 2011 there was an increase in volatility following the release of the stress test results. However, in the first exercise, the reduction of volatility was most striking among the control group of stocks and among those that barely passed the tests whereas in 2011 the increase in volatility was predominant among the banks that did pass the test.

1. INTRODUCTION

The year 2007 marks the beginning of an intense financial crisis which originated in the U.S. credit markets. In 2010 and 2011 the turbulence was triggered in the European sovereign debt. The European banking system was negatively affected by the prospect of states defaulting, the devaluation of stocks and resulting accounting impairment.

In an attempt to restore confidence among investors and depositors, in 2010 and 2011 the European Banking Authority (EBA) performed a series of tests of financial soundness on a sample of European banks in order to gauge their capital needs, Tier-1 ratios and ratios of resilience to adverse shocks, including scenarios of devaluation of their assets – particularly European government debt. On July 23th, 2010 results of the first round of stress testing were released. The exercise was undertaken for a sample of 91 European banks from 20 countries, representing at that date 65% of the total assets of all European banks. Tests were conducted on a time horizon of 2 years and took into account market and credit risks, including exposure to European sovereign debt. A similar exercise was conducted in 2011, whose results were published on July 15th, 2011. The 2011 exercise covered 90 major banks domiciled in 21 countries with the aim of assessing the resilience of European banks in an adverse, albeit plausible, scenario.

In both exercises, the release of the results was intended to increase transparency in the publication of information from European banks, with particular emphasis on their exposure to sovereign risk. It further sought to provide national supervisors with an additional tool for assessing prudential risk from a pan-European perspective. Notwithstanding the above, these stress tests were not intended to cover all areas of financial risk and European banking business, nor did they assume extreme scenarios with regard to sovereign risk.

The purpose of this paper is to evaluate the informational content conveyed in the publication of the stress test results. Indeed, it aims to assess whether the information disclosed by the supervisor - EBA – was of value to investors and was subsequently incorporated into prices (i.e., the stress test did produce new information about European banks), or whether, on the contrary, there was no visible effect on prices, which could indicate that the stress test did not produce new information about European banks.[1] The research questions we address in the paper are the following: *i) Was the price of the European financial stocks influenced by the disclosure of the results of the stress tests? ii) Did the stress test 'ratings' have any impact on the prices and volatility of the stocks? iii) Did the disclosure of the stress test results have any systemic effect on the behavior of the European financial stocks?*

Banking supervision offers unique information about banking institutions. In part this information derives from their legal powers, which are available neither to investors nor analysts (Prescott, 2008). A significant number of studies highlight the active role of regulators in the production of information about the banking system (Jordan, 1999; SGD, 2000). In fact, it has been argued that the financial information published by supervisors can help to reduce information asymmetry in financial markets and in particular in the banking sector, since it is more opaque than other sectors (see Morgan, 2002, on financial industry opaqueness[2]). Flannery (1998) reviews and evaluates the growing empirical literature on private investors' abilities to assess the financial condition of banking firms.

Flannery *et al.* (2004) argue that regulation helps to mitigate the problem of information asymmetry, since banking business is in general more opaque than that of other non-financial companies. The DGS (2000) states that banking supervision reports are important to financial analysts, credit rating agencies and institutional investors, as they incorporate information which allows them to directly compare different financial institutions. In the same context, Francis *et al*. (2008) conclude that the stocks of financial institutions in countries with more effective banking supervision are comprised of more systematic / macroeconomic information than specific information. At the same time, they argue that banking supervisors should increasingly publish this information, because of its influence on markets at the aggregate level.

1- On July 11th, 2012 and October 3rd, 2012, EBA released the preliminary and the final results of the 2012 European Capital Enhancement Exercise, respectively. As the banking authority stated, the scope of that exercise was not to perform a stress test. Part of that exercise relied on the computation of a Core Tier 1 ratio deducted from the 'sovereign buffer' (which was derived from impairment adjustments to sovereign debt held by the banking sector). Although the evaluation of the effects of the disclosure of this information on market prices seems appealing, it presents several challenges. On the one hand, it is likely that the surprise effect of the disclosure of the final report had vanished with the publication of the preliminary outcome, and with the news regarding the resource to public funds by some banks (which have not fulfilled the goal of a Core Tier 1 of 9% after deducting the 'sovereign buffer') in order to perform the recapitalization plan. On the other hand, most of the information released in the preliminary report was not published on an individual basis (bank-by-bank), but rather for the whole sample of banks. In fact, the only information released on an individual basis concerns past information related to public funds' injection in the financial system. For these reasons, we decided not to include this exercise in this paper.

2- Morgan (2002) finds that bond raters disagree more over banks than other firms. He concludes that banks are inherently more opaque than other types of firms.

In contrast, Pettway (1980) performs event studies for six large banks that were placed on the "problem bank list" during 1972-76 and finds significantly negative cumulative abnormal returns in the 38 weeks before the start of the inspection which first recognized the bank's problems, suggesting markets' anticipation over supervisors'. In line with these results, Cargill (1989) reports that CAMEL ratings add no significant explanatory power beyond what is provided by Call Report financial ratios, meaning that supervisory assessments are not informative.

Flannery and Houston (1998), though, reveal that investors evaluate financial information differently when Bank Holding Companies had recently received an on-site inspection. According to Berger and Davis (1998), banks hold a great deal of private information, and one of the objectives of banking supervision is the acquisition of this information. Using the event study approach, the authors analyze whether there is any association between supervision reports to financial institutions (CAMELS) and supra-normal returns on bank stocks. Their results suggest that banking supervision reports do provide some private information of value. Their analysis identifies three informational components of banking supervision: the auditing of bank accounts (to verify the truthfulness and accuracy of accounting information), the publication of information about the condition of banks, and the disciplinary treatment that banks in worse condition may receive from the supervisor. According to the authors, the only component identified as having a significant effect is the publication of information about the condition of banks.

Hirschhorn (1987) also investigates the effects of regulatory discipline and disclosure of information by supervisors. His results point to the existence of supra-normal returns following changes in the rating given by banking supervisors, even though most of the information published is publicly available.

DeYoung *et al*. (1998) state that supervision reports to major U.S. financial institutions provide new information that financial markets internalize only in subsequent months. These supervision reports may show relevant information about the supervised institutions. Similarly, DeYoung *et al.* (1997) find evidence that credit risk (yield spread) is influenced by the results of CAMEL / BOPEC tests, which is consistent with the hypothesis that supervisors reveal important information not anticipated by the market.

More recently, Peristian *et al.* (2010) analyzes the informational value of stress test results conducted by federal bank supervisors in 2009 in the US. This stress test was an extraordinary bank examination where the outputs, but also the inputs of scenarios simulations/modeling assumptions, were disclosed, in contrast with ordinary inspections in which the inputs and output were kept confidential. The authors conclude that the stress test was informative. In fact, the market anticipated on its own which banks would have capital gaps before de stress test results were disclosed, but banks with larger capital gaps (compared to market expectations) experienced more negative abnormal returns.

In short, the success of banking supervision reports in revealing private information about asset quality and risk of financial institutions is an issue that has been addressed in the literature. This study aims to conduct a similar exercise in order to ascertain whether the results of stress tests were anticipated by the market or whether, on the contrary, they are of informational value to markets and were embedded in prices in the trading sessions that followed the announcement of the results. The paper uses a standard event study methodology in order to assess the informational value of the disclosure of the stress test results. However, we assess for the first time whether stress tests produce new information about European banks, and conclude that they are in fact informative.

Our study differs from Peristian et al. (2010) on two distinct aspects. Firstly, we study European banks. Secondly, we also study the impact of the disclosure of the stress test results on volatility. The paper is structured as follows. The sample is presented in section 2. Section 3 presents the methodology and section 4 discusses the results. Some concluding remarks are made in the final section of the paper.

2. SAMPLE

Our sample consists of 171 listed financial stocks of Western Europe. Of those companies, 50 (51) are listed financial institutions that were stress tested in 2010 (2011). The remaining stocks (financial stocks not subject to the stress tests) are included in the control group. Market prices and respective national benchmarks are obtained from Bloomberg, while ratings obtained by financial institutions in the stress tests are collected from the European Banking Authority (EBA) website.

3. METHODOLOGY

We use a standard event study methodology to assess the impact of disclosing the banks' stress test results on the evolution of stock prices.[3] This method involves calculating abnormal returns and assessing their statistical significance in the trading sessions that follow the release of the stress test results (and the previous trading sessions, should there be signs of market anticipation of the event).

We use an estimation window of 120 trading sessions, covering the period [^{t} -129; ^{t} -10], where $^t0$ represents the respective trading session for the publication of said stress test results. The estimation of normal returns uses the market model:

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

where R_{it} represents the return on asset i in t and R_{mt} is the market return in t.

Regarding the event windows, six alternatives are considered: (i) [t–9; t-1]; (ii) [t–5; t-1]; (iii) [t 1; t 5]; (iv) [t 1; t 10]; (v) [t 0; t 5] and (vi) [t 0; t 10], with t 0 as defined.

Upon disclosure of the stress test results (the event), we split the sample in four different groups of banks. The first group (control group) includes all banks that were not stress tested. All other banks subject to stress tests belong to the treatment group, and are divided in three classes. In class A we include listed banks that passed the stress-test without any problem. Class B includes listed banks that barely passed the stress test. Finally, we include in class C those banks that fail the stress test exercise. The analysis involves the computation of cumulative abnormal returns (CAR) for the different groups of banks and the comparison of the results obtained.

3- See Brown and Warner (1985) event study methodology survey and Boehmer *et al.* (1991) correction method when event induced variance is present.

4. RESULTS

4.1 First Stress Test Exercise

The results of the first stress test exercise for European banks were disclosed on July 23rd 2010. 91 banking institutions were included in the tests, of which 50 were publicly traded companies with significant liquidity in secondary stock markets.[4] These banks are divided into three classes. Class C contains the one listed company (ATE BANK) that failed the stress test.[5] Class B includes those listed companies that achieved tangential[6] results in the exercise: Piraeus Bank, Monte dei Paschi di Siena, UBI Banka, Allied Irish Bank, Espírito Santo Financial Group (and Banco Espírito Santo), Deutsche Postbank and Bankinter. The remainder of the listed companies assessed in the stress test are included in class A.

We start our investigation testing the hypothesis:

H1: After the disclosure of the stress test results, CAR from financial stocks aren't statistically different from 0

The first stage of the analysis involves calculating the CAR for stocks in the treatment group (classes A, B and C, all subject to the stress test) and for stocks in the control group. Approximately 21.1% and 17.5% of stocks in the full sample record positive and statistically significant CAR in the event windows which include, respectively, the five and ten trading sessions after the disclosure of the stress test results. However, comparison of the results from the treatment group and the control group reveals that the percentage of stocks with positive and statistically relevant CAR is clearly higher in the treatment group in the abovementioned event windows. Indeed, 36.0% and 22.0% of stocks from banks subject to the stress test record positive and statistically significant CAR in those two event windows. These values compare with 14.9% and 15.7% of the stocks included in the control group - see Table 1 - Panel A.

Among the group of stocks from banks subject to stress tests, 41.5% and 26.8% of class A stocks record positive and statistically significant positive CAR in the windows which include the five and ten trading sessions after the event. On the

4- The analysis does not include stocks of listed financial institutions submitted to the stress tests whose business was discontinued.

5- "Failed" means that the bank's capital may fall below the threshold of 5% CT1R over the two-year time horizon.

6- "Tangential results" means a CT1R of between 5% and 6% over the two-year time horizon.

contrary, none of the stocks that make up class B show abnormal returns. Finally, since class C consists of only one stock, it would not thus be appropriate to draw conclusions from the results obtained - see Table 1 - Panel A.

A similar exercise is conducted in parallel to ascertain the percentage of stocks with statistically significant negative CAR after the event. In all the groups of stocks examined, this percentage is less than 5%, which indicates that, overall, the results of stress tests had no negative impact on the price of the financial stocks.

Summing up, the available evidence allows one to reject H1, and conclude that the disclosure of the stress-test result did have informational content.

We next test the hypotheses

H2: CAR of the stocks subjected to stress test and those in the control group are statistically identical;
H3: Class A stocks show similar price reaction to those included in class B;
H4: Class A stocks show similar price reaction to those in the control group.

The average CAR for all stocks in the sample in the windows which include the five and ten trading sessions after the event are 2.86% and 3.52%, respectively. In stocks subject to the stress test the average CAR is 4.58% and 4.11%, compared with 2.15% and 3.28% in the control group. CAR are statistically significant, although the results are less robust in the control group when correction for statistical variance in the test is applied to cross-sectional effects - see Table 2 - Panel A.

Breaking down the treatment group into classes of stocks it confirms that the stocks with the best results in the stress test also show higher stock returns than the rest. The average CAR among the class A stocks is 4.67% and 4.25% in the event windows that include, respectively, the five and ten trading sessions after the event, and they are statistically significant. In the class B stocks, the results also point to the existence of positive CAR, although more modest by comparison with those of class A. Furthermore, the CAR obtained for these stocks in the ten trading sessions after the publication of the stress test results are generally not statistically different from zero - see Table 2 - Panel B. As for the stocks that did not pass the stress test (class C), there is surprisingly evidence of positive CAR in the [1, 5] event window, suggesting that they may have benefited from the general good results that banks have exhibited in the test. In other words, the fact that only one (listed) bank failed the test was a good surprise because market agents were expecting more banks to fail, and did not penalize the institution that did not pass the test.

Panel C of Table 2 shows the results of some additional tests. All in all, we reject H2 and H4, at least for the [1, 5] event window, and conclude that the average CAR of the stocks in the treatment group is higher than the control group, and that this is explained by the higher CAR of those stocks that passed the stress test. As for H3, this hypothesis is not rejected, which means that there is no statistical difference in the reaction to new information between stocks that strongly and barely passed the test. Again, one possible explanation is that, in the context of the financial crisis, the market was so eager to have good news that agents did not care to reward stocks that strongly passed the test differently than those who barely passed the stress test exercise, or that the difference between actual and expected capital needs was similar for both groups of banks.

Another important aspect of the market behavior of stocks is volatility. The following hypotheses are tested in the following paragraphs:

H5: Stock volatility is similar before and after the disclosure of the stress-test results
H6: Stock volatility is lower after the disclosure of the stress test results
H7: There does not exist any systemic effect (on volatility) of the disclosure of the stress test results

Table 3 displays a summary of the results of tests for equality of variances of stock returns in the estimation window and in the various event windows considered. These tests reveal that the proportion of stocks with higher variance of raw returns in the event windows is less than 5% of the entire sample. Among the stocks from banks subject to the stress test this ratio is less than or equal to 2%, whereas in the control group it is less than or equal to 5%. However, the proportion of stocks in the control group with lower raw return variance in the event windows which include the five and ten trading sessions after the event is 9.1% and 19.0%, respectively. The proportions among the stocks submitted to stress tests are 12.5% and 37.5% in the class B institutions (and 2.4% and 4.9% in class A).

Despite the slight difference in the values of those proportions, the findings outlined in the previous paragraph are still valid considering the variance of abnormal rather than raw returns. In fact, in comparison with the control group, the group submitted to the stress test continues to show a lower proportion of stocks with an increase in variance in the event windows which include trading sessions subsequent to the publication of the results. Among the treatment group, the class B stocks reveal a higher proportion of cases where there is a reduction in volatility.

Summing up, as a consequence of the disclosure of the results of the first stress test exercise, not only banks subject to the test witnessed a reduction of volatility of stock returns, but there also were positive externalities because many banks not tested also experienced a reduction of the volatility of returns. Thus, H5 is rejected.

In parallel with the F tests for changes in variance, a second set of tests is based on GARCH models. Consider the following GARCH (1,1) model:

$$R_{it} = \alpha_i + \beta i \times R_{mt} + v_t$$
$$v_t^2 = \gamma_0 + \gamma_1 \times v_{t-1}^2 + l_1 \times \sigma_{t-1}^2 + \text{Ø} \times dt \qquad (2)$$

Where R_{it} is the return of asset i in t; R_{mt} corresponds to the market return in t; dt is a binary variable that takes the value 1 in the event window and 0 in the remaining observations, v_t is an error term and s^2 is the variance.

The results of this structural break test are in Table 5 and suggest a general reduction in volatility after the event, both for the stocks of banks subject to the stress test (particularly class B stocks) and the other stocks. The reduction in volatility appears, however, to be most notable among the stocks in the control group, where 29.8% and 28.9% of stocks exhibit a reduction in volatility in the five and ten trading sessions after the disclosure of the stress test results (Table 4).

On the other hand, the t-tests conducted to determine the average ratio of variances suggest that, contrary to what happens with the control group, the stocks of the banks subjected to the stress test show reductions in variance of raw and abnormal returns, and this reduction was more evident among the class B stocks - see Table 5.

A third category of tests used is the Beavers' U test. The test statistic used is given by:

$$U_i = \left(\frac{ARi}{\sigma(ARi)}\right)^2 \sim F(1, T-d) \tag{3}$$

where AR_i is the abnormal return of stock i; σ (AR_i) represents the standard deviation of the abnormal return of stock i; T is the number of observations used for computing the standard deviation of abnormal returns; and d is the number of variables used in the expected return equation.

In aggregate terms the test statistic is given by:

$$Z = \frac{\sum_{i=1}^{N} U_i - N\times\frac{(T-d)}{(T-d-2)}}{\sqrt{2\times N\times\frac{(T-d)^2\times(T-d-1)}{(T-d-2)^2\times(T-d-4)}}} \sim N(0,1) \tag{4}$$

Simulations by Dodd et al. (1984) indicate that the Z-statistic is poorly specified, and in particular is "fat-tailed", rejecting the null hypothesis too often. Pattel (1976) notes that this measure should not be used to evaluate changes in variance, but rather changes in mean and variance concurrently. We reject the hypothesis of no variance/mean change in cumulative abnormal returns on the stocks that make up the control group and the class A stocks submitted to the stress test (Table 6). In the case of the class B stocks this hypothesis is not rejected.

Thus, the combination of these results allows us to conclude that financial stock volatility is lower after the disclosure of the stress test results and therefore we do not reject H6. As for H7, the hypothesis is rejected and we conclude that the disclosure of the results did contribute to reduce the volatility of all financial stocks (even those not examined in stress tests).

To sum up, our results suggest that the publication of stress test results conveys new relevant information and did have an impact on the behavior of European financial stocks. The stocks subject to the stress test exercise (and in particular those designated class A) show higher cumulative abnormal returns than the other financial stocks, which could mean that the information included in the publication of the results of this stress test exercise is of value to investors and was incorporated into prices. Our results also suggest that the disclosure of the stress test results reduced the opacity of banks subjected to the test but not the opacity of non-tested banks. However, there is no evidence that the stocks of banks that strongly passed the test (class A stocks) obtained higher cumulative abnormal returns than the stocks of banks that barely passed the test (class B). Regarding volatility, there seems to have been a reduction in this measure of risk following results' publication. It turns out that the reduction in volatility was more evident among the control group stocks and in those that apparently passed the tests with some difficulty (class B), suggesting the existence of positive externalities via the reduction of uncertainty.

4.2 Second Stress Test Exercise

The second set of stress test results for the European banking sector was published on July 15th, 2011. This second set of tests included 90 large banking institutions domiciled in 21 European countries, of which 51 were publicly traded companies with high liquidity in secondary markets. Five listed banks failed the stress test: ATE Bank, Caja de Ahorros del Mediterrâneo, EFG Eurobank Ergasias, Banco Pastor and Oesterreichische Volksbank. These banks are included in class C of the institutions assessed. In turn, BCP, Bankinter, Banco Populare, Espírito Banco Financial Group, Banco Popular Español, Banco de Sabadell, Piraneus Bank Group and TT Hellenic Postbank are included in class B, given that they passed the tests with some difficulty. The remaining listed stocks from institutions subject to scrutiny in the stress test are included in class A.

The methodology set forth in the previous section is used, CAR for the stocks of those banks subject to the stress test (treatment group) and for the stocks in the control group are computed, and the seven hypotheses are tested.

Regarding the treatment group, positive and statistically significant CAR are detected after the event. In the control group, the percentages of stocks with positive and statistically significant CAR are more modest (Table 7 - Panel A). Likewise, the percentage of stocks in both groups with significant negative CAR after the event diminished substantially. Thus, H1 is rejected; not only there was a high percentage of stocks with negative CAR before the event but also a high percentage of stocks exhibit positive CAR after the disclosure of the stress test results.

Table 8 shows the results of the statistical significance of the average CAR for each group of stocks analyzed and confirms that the stocks of the banks subjected to the stress test had supra-normal returns of 3.91% and 4.17% in the 5 and 10 trading sessions after the event. In turn, the stocks in the control group show, on average, supra-normal though more modest returns of 1.18% and 1.52% in the same windows. Class A stocks record higher (and statistically significant) CAR after the event. The stocks of banks that failed the stress test exhibit positive, though not statistically significant CAR, as is also the case with the stocks of banks that barely passed the test. On the whole, the abnormal returns of stocks from A and B banks do not differ statistically. Furthermore, the A stocks show statistically higher CAR than those in the control group. Therefore, H2 and H4 are rejected, but H3 is not.

As regards the evolution of the variance of returns, there are remarkable differences with the results from the first stress test exercise. In fact, unlike what happened in 2010, one can see a sharp increase in volatility among the titles submitted to the stress test in the 10 trading sessions after 15-07-2011 (increase in the variance of raw and abnormal returns in 41.2 % and 27.5% of stocks, respectively). The increase in variance was even more marked among the B stocks (Table 9). Surprisingly, in the control group there is a higher proportion of stocks with lower volatility after the event. Thus, H5 is rejected.

These results are corroborated by the GARCH model test for structural breaks in volatility - see Table 10. Approximately 66.7% and 55.6% of B stocks record significant increases in volatility in the five and ten trading sessions after the event. Among the A stocks these values drop to 27.0% and 29.7%, respectively. This structural break test also confirms that there are some stocks that failed the test and yet witnessed a drop in volatility, and that the volatility also diminished for stocks in the control group.

Table 11 displays the results of a t test to ascertain whether there is a significant change in variance between the estimation and the event windows. Overall, the full sample does not show a significant increase in raw or abnormal return variance. However, the results suggest a significant increase in the variance of stocks subject to the test, particularly among the A and B stocks in the trading sessions after the event. No statistically significant increase in variance is detected among the C stocks. Finally, the Beavers U test (Table 12) rejects the hypothesis of mean/ variance stability in cumulative abnormal returns in the set of stocks in the sample, among both those that constitute the control group, and those submitted to the stress test. Thus, H6 is rejected but H7 is not.

To sum up, results of the analysis suggest that the publication of results of the second stress test exercise had an impact on the aggregate behavior of European financial stocks. The stocks subject to the test (and in particular those that passed it) have higher cumulative abnormal returns than other financial stocks. However, there is no statistical evidence that the stocks of banks that strongly passed the stress test obtained higher cumulative abnormal returns than those than barely passed it. As regards volatility, and contrary to the 2010 exercise, there seems to have been an increase in volatility among the A and B stocks in the trading sessions after the disclosure of the stress test results.

5. CONCLUSIONS

This paper assesses for the first time the informational content of the results of stress tests for European financial markets, that is, it assesses whether publication of the results of these tests convey new information for the financial firms examined. The research questions we address in the paper are the following: *i) Was the price of the European financial stocks influenced by the disclosure of the results of the stress tests? ii) Did the stress test 'ratings' have any impact on the prices and volatility of the stocks? iii) Did the disclosure of the stress test results have any systemic effect on the behavior of the European financial stocks?*

The results we present in this analysis detect a significant influence from the disclosure of the stress tests results on the prices of stocks in the European banking sector, particularly among those stocks submitted to the tests. It is clear that publication of stress test results in the sample of banking sector stocks had a positive and immediate influence on the aggregate behavior of this sector. In addition, the stocks of those banks that underwent stress test exercises (and in particular, stocks of banks that clearly passed the tests) achieved higher cumulative abnormal returns than other stocks in the financial sector, indicating that investors attribute value to the information contained in the results of these tests. However, there is no evidence that the stocks of banks that clearly passed the tests obtained higher cumulative abnormal returns than those stocks that passed the test by a narrow margin. This evidence suggests that the 'size' of the surprise (i.e., similar differences between actual and expected capital needs for both groups) could provide an explanation for the similarity of the impact.

In terms of volatility, there are apparently different conclusions to be drawn from the two stress test exercises. In 2010 there was a reduction in volatility following the publication of results. However, and somewhat surprisingly, the reduction of volatility was most striking among the control group of stocks and among those that barely passed the tests. On the other hand, in 2011 there was an increase in volatility following the release of the stress test results, particularly among the banks that did pass the test.

In view of the evidence gathered there appear to be advantages in supervisors disclosing financial information about the banking sector. Essentially, these advantages include an increase in information available to investors and financial analysts, and the incorporation of information from banks which is often "hidden" from these actors in stock prices, but available for financial supervisors under their legal power to demand such information.

Table 1

Percentage of stocks with statistical significant (positive or negative) CAR (5% level) in the event window [Stress Test 23-07-2010]

Panel A (CAR>0)

Event window	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	2.3%	1.2%	21.1%	17.5%	17.5%	16.4%
Treatment group	4.0%	2.0%	36.0%	22.0%	34.0%	16.0%
Control group	1.7%	0.8%	14.9%	15.7%	10.7%	16.5%
Class A	4.9%	2.4%	41.5%	26.8%	39.0%	19.5%
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Class C	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%

Panel B (CAR<0)

Event window	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	1.2%	1.8%	1.8%	1.8%	1.8%	2.3%
Treatment group	0.0%	2.0%	4.0%	4.0%	2.0%	4.0%
Control group	1.7%	1.7%	0.8%	0.8%	1.7%	1.7%
Class A	0.0%	0.0%	4.9%	4.9%	2.4%	4.9%
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Class C	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%

Table 2

Market Model (Stress Test 23-07-2010)

Panel A

Event window	Full sample				Treatment group				Control group				Event window
	CAR	*t-stat*			CAR	*t-stat*			CAR	*t-stat*			
		Standard	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*		*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*		*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*	
[-9;-1]	-0,16%	-0,32	-0,28	-0,18	-0,35%	-0,49	-0,58	-0,42	-0,07%	-0,12	-0,11	-0,05	**[-9;-1]**
[-5;-1]	0,07%	0,20	0,16	0,11	-0,14%	-0,27	-0,37	-0,23	0,16%	0,35	0,30	0,14	**[-5;-1]**
[1;5]	2,86%	7,82 (***)	6,01 (***)	4,33 (***)	4,58%	8,61 (***)	7,03 (***)	7,27 (***)	2,15%	4,59 (***)	4,16 (***)	1,88 (*)	**[1;5]**
[1;10]	3,52%	6,81 (***)	5,85 (***)	3,78 (***)	4,11%	5,46 (***)	4,99 (***)	4,61 (***)	3,28%	4,96 (***)	4,59 (***)	2,03 (**)	**[1;10]**
[0;5]	2,80%	6,98 (***)	5,60 (***)	3,87 (***)	4,37%	7,49 (***)	6,11 (***)	6,32 (***)	2,15%	4,20 (***)	3,91 (***)	1,72 (*)	**[0;5]**
[0;10]	3,46%	6,37 (***)	5,59 (***)	3,54 (***)	3,90%	4,93 (***)	4,55 (***)	4,16 (***)	3,28%	4,73 (***)	4,47 (***)	1,93 (*)	**[0;10]**

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

Panel B

Event window	Class A				Class B				Class C				Event window
	CAR	*t-stat*			CAR	*t-stat*			CAR	*t-stat*			
		Standard	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*		*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*		*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*	
[-9;-1]	-0,16%	-0,21	-0,25	-0,10	-0,36%	-0,17	-0,20	-0,14	-8,23%	-1,31	-1,55	-1,31	**[-9;-1]**
[-5;-1]	-0,05%	-0,09	-0,12	-0,04	0,40%	0,26	0,34	0,22	-8,40%	-1,79 (*)	-2,12 (**)	-1,79 (*)	**[-5;-1]**
[1;5]	4,67%	8,31 (***)	6,26 (***)	4,07 (***)	3,15%	2,02 (**)	2,85 (***)	1,69 (*)	12,34%	2,63 (***)	1,79 (*)	2,63 (***)	**[1;5]**
[1;10]	4,25%	5,34 (***)	4,56 (***)	2,62 (***)	3,00%	1,36	2,03 (**)	1,14	7,48%	1,13	0,75	1,13	**[1;10]**
[0;5]	4,58%	7,43 (***)	5,66 (***)	3,64 (***)	2,78%	1,63	2,32 (**)	1,36	8,57%	1,67 (*)	0,93	1,67 (*)	**[0;5]**
[0;10]	4,15%	4,97 (***)	4,31 (***)	2,44 (**)	2,62%	1,13	1,70 (*)	0,95	3,71%	0,53	0,34	0,53	**[0;10]**

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

Panel C

Event window	Treatment group *versus* Control group				Class A *versus* Class B				Class A *versus* Control group				Event window
	CAR	*t-stat*			CAR	*t-stat*			CAR	*t-stat*			
		Standard	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*		*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*		*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*	
[-9;-1]	-0,28%	-0,29	-0,31	-0,16	0,20%	0,09	0,10	0,07	-0,08%	-0,09	-0,09	-0,04	**[-9;-1]**
[-5;-1]	-0,31%	-0,43	-0,45	-0,24	-0,45%	-0,27	-0,36	-0,21	-0,21%	-0,29	-0,31	-0,13	**[-5;-1]**
[1;5]	2,43%	3,43 (***)	2,92 (***)	1,86 (*)	1,52%	0,92	1,14	0,70	2,52%	3,45 (***)	2,78 (***)	1,56	**[1;5]**
[1;10]	0,83%	0,83	0,76	0,45	1,25%	0,53	0,72	0,40	0,96%	0,93	0,82	0,42	**[1;10]**
[0;5]	2,22%	2,86 (***)	2,46 (**)	1,55	1,80%	0,99	1,25	0,75	2,43%	3,03 (***)	2,48 (**)	1,37	**[0;5]**
[0;10]	0,61%	0,58	0,54	0,32	1,53%	0,62	0,84	0,47	0,87%	0,80	0,72	0,36	**[0;10]**

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

Table 3

F test for equality of two population variances (variance in the event window *vs* variance in the estimation window) [Stress Test 23-07-2010]

Panel A - Raw returns – Percentage of cases where the null hypothesis is rejected

A1: σ^2 (Event) > σ^2 (EW)

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	1,2%	0,6%	0,6%	4,1%	1,2%	4,1%
Treatment group	0,0%	0,0%	0,0%	2,0%	0,0%	2,0%
Control group	1,7%	0,8%	0,8%	5,0%	1,7%	5,0%
Class C	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Class B	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Class A	0,0%	0,0%	0,0%	2,4%	0,0%	2,4%

A2: σ^2 (Event) < σ^2 (EW)

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	20,5%	5,8%	7,6%	16,4%	9,9%	20,5%
Treatment group	16,0%	0,0%	4,0%	10,0%	8,0%	18,0%
Control group	22,3%	8,3%	9,1%	19,0%	10,7%	21,5%
Class C	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Class B	12,5%	0,0%	12,5%	37,5%	25,0%	37,5%
Class A	17,1%	0,0%	2,4%	4,9%	4,9%	14,6%

Panel B - Abnormal returns – Percentage of cases where the null hypothesis is rejected

B1: σ^2 (Event) > σ^2 (EW)

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	2,3%	1,2%	0,6%	8,2%	2,3%	9,9%
Treatment group	2,0%	0,0%	0,0%	8,0%	2,0%	12,0%
Control group	2,5%	1,7%	0,8%	8,3%	2,5%	9,1%
Class C	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Class B	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Class A	2,4%	0,0%	0,0%	9,8%	2,4%	14,6%

B2: σ^2 (Event) < σ^2 (EW)

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	30,4%	18,7%	12,3%	19,9%	13,5%	19,9%
Treatment group	32,0%	8,0%	2,0%	8,0%	4,0%	12,0%
Control group	29,8%	23,1%	16,5%	24,8%	17,4%	23,1%
Class C	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Class B	25,0%	12,5%	12,5%	25,0%	25,0%	25,0%
Class A	34,1%	7,3%	0,0%	4,9%	0,0%	9,8%

Table 4

Structural break test in the GARCH(1,1) volatility: Percentage of financial stocks without stability in the variance equation [Stress Test 23-07-2010]

Panel A: Higher volatility

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	1,8%	1,8%	7,0%	2,9%	7,0%	4,7%
Treatment group	2,0%	2,0%	10,0%	2,0%	10,0%	6,0%
Control group	1,7%	1,7%	5,8%	3,3%	5,8%	4,1%
Class C	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Class B	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Class A	2,4%	2,4%	12,2%	2,4%	12,2%	7,3%

Panel B: Lower volatility

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	36,8%	40,9%	27,5%	27,5%	25,1%	25,7%
Treatment group	40,0%	38,0%	22,0%	24,0%	24,0%	22,0%
Control group	35,5%	42,1%	29,8%	28,9%	25,6%	27,3%
Class C	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Class B	62,5%	50,0%	37,5%	25,0%	37,5%	25,0%
Class A	36,6%	36,6%	19,5%	24,4%	22,0%	22,0%

Table 5

T-test: variance ratio (VR = event window variance / estimation window variance) equal to 1 [Stress Test 23-07-2010]

Panel A: Raw returns

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	-3,90 (***)	-3,69 (***)	0,73	-0,27	0,53	-0,49
Treatment group	-4,02 (***)	-4,31 (***)	-0,24	-2,58 (***)	-0,91	-3,19 (***)
Control group	-2,79 (***)	-2,67 (***)	0,76	0,17	0,66	0,07
Class C	-	-	-	-	-	-
Class B	-3,59 (***)	-1,90 (*)	-1,98 (**)	-4,18 (***)	-2,31 (**)	-4,53 (***)
Class A	-3,13 (***)	-3,68 (***)	0,12	-1,78 (*)	-0,67	-2,41 (**)

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

Panel B: Abnormal returns

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	-2,83 (***)	2,03 (**)	1,78 (*)	2,17 (**)	1,79 (*)	-20,28 (***)
Treatment group	-1,74 (*)	-4,29 (***)	3,50 (***)	1,97 (**)	3,57 (***)	1,89 (*)
Control group	-1,74 (*)	-1,62	1,25	1,24	1,28	1,26
Class C	-	-	-	-	-	-
Class B	-0,37	-1,05	-0,47	-3,00 (***)	-0,47	-2,91 (***)
Class A	-1,65 (*)	-4,32 (***)	3,67 (***)	2,33 (**)	3,66 (***)	2,22 (**)

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

Table 6
Beavers' U Test [Stress Test 23-07-2010]

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	-3,93 (***)	-4,28 (***)	10,45 (***)	5,89 (***)	7,35 (***)	4,81 (***)
Treatment group	-0,94	-1,69 (*)	11,70 (***)	3,68 (***)	7,23 (***)	1,97 (**)
Control group	-4,06 (***)	-4,01 (***)	4,90 (***)	4,63 (***)	4,09 (***)	4,45 (***)
Class C	0,48	1,50	4,05 (***)	0,17	1,21	-0,50
Class B	-1,47	-1,39	0,12	-0,62	-0,68	-1,14
Class A	-0,46	-1,48	12,24 (***)	4,31 (***)	8,09 (***)	2,76 (***)

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

Table 7
Percentage of stocks with statistical significant (positive or negative) CAR (5% level) in the event window [Stress Test 15-07-2011]

Panel A (CAR>0)

Event window	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	0,0%	0,6%	14,0%	8,8%	11,7%	9,9%
Treatment group	0,0%	2,0%	25,5%	15,7%	21,6%	15,7%
Control group	0,0%	0,0%	9,2%	5,8%	7,5%	7,5%
Class C	0,0%	0,0%	20,0%	20,0%	0,0%	0,0%
Class B	0,0%	0,0%	11,1%	11,1%	11,1%	11,1%
Class A	0,0%	2,7%	29,7%	16,2%	27,0%	18,9%

Panel B (CAR<0)

Event window	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	12,9%	11,1%	2,9%	1,8%	4,1%	2,9%
Treatment group	23,5%	13,7%	2,0%	2,0%	0,0%	2,0%
Control group	8,3%	10,0%	3,3%	1,7%	5,8%	3,3%
Class C	20,0%	20,0%	0,0%	0,0%	0,0%	0,0%
Class B	11,1%	11,1%	11,1%	11,1%	0,0%	0,0%
Class A	27,0%	13,5%	0,0%	0,0%	0,0%	2,7%

Table 8

Market Model [Stress Test 15-07-2011]

Panel A

Event window	Full sample				Treatment group				Control group				Event window
		t-stat				*t-stat*				*t-stat*			
	CAR	*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*	CAR	*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*	CAR	*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*	
[-9;-1]	-2,28%	-3,71 (***)	-3,12 (***)	-2,32 (**)	-3,11%	-2,78 (***)	-2,62 (***)	-3,23 (***)	-1,93%	-2,44 (**)	-2,26 (**)	-1,08	**[-9;-1]**
[-5;-1]	-1,49%	-3,27 (***)	-2,91 (***)	-2,04 (**)	-1,48%	-1,77 (*)	-2,06 (**)	-2,06 (**)	-1,50%	-2,54 (**)	-2,54 (**)	-1,13	**[-5;-1]**
[1;5]	1,99%	4,36 (***)	3,98 (***)	2,72 (***)	3,91%	4,68 (***)	3,88 (***)	5,46 (***)	1,18%	1,99 (**)	2,05 (**)	0,89	**[1;5]**
[1;10]	2,31%	3,56 (***)	3,52 (***)	2,23 (**)	4,17%	3,51 (***)	2,92 (***)	4,11 (***)	1,52%	1,81 (*)	2,07 (**)	0,81	**[1;10]**
[0;5]	1,64%	3,28 (***)	2,76 (***)	2,05 (**)	3,86%	4,22 (***)	3,53 (***)	4,92 (***)	0,70%	1,08	1,03	0,48	**[0;5]**
[0;10]	1,96%	2,88 (***)	2,69 (***)	1,80 (*)	4,12%	3,31 (***)	2,78 (***)	3,87 (***)	1,04%	1,18	1,27	0,53	**[0;10]**

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

Panel B

Event window	Class A				Class B				Class C				Event window
		t-stat				*t-stat*				*t-stat*			
	CAR	*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*	CAR	*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*	CAR	*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*	
[-9;-1]	-1,85%	-1,31	-1,64	-0,93	-3,42%	-2,13 (**)	-2,29 (**)	-1,53	-11,89%	-3,36 (***)	-1,42	-3,20 (***)	**[-9;-1]**
[-5;-1]	-0,94%	-0,89	-1,20	-0,64	-1,32%	-1,10	-1,14	-0,79	-5,75%	-2,18 (**)	-1,45	-2,08 (**)	**[-5;-1]**
[1;5]	4,35%	4,11 (***)	3,54 (***)	2,94 (***)	2,29%	1,91 (*)	1,49	1,37	3,66%	1,39	0,92	1,32	**[1;5]**
[1;10]	4,48%	2,99 (***)	2,56 (**)	2,14 (**)	2,13%	1,26	1,01	0,90	5,50%	1,47	1,00	1,41	**[1;10]**
[0;5]	4,48%	3,87 (***)	3,57 (***)	2,76 (***)	2,89%	2,21 (**)	1,83 (*)	1,58	1,09%	0,38	0,20	0,36	**[0;5]**
[0;10]	4,61%	2,93 (***)	2,62 (***)	2,10 (**)	2,74%	1,54	1,26	1,11	2,93%	0,75	0,45	0,71	**[0;10]**

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

Panel C

Event window	Treatment group *versus* Control group				Class A *versus* Class B				Class A *versus* Control group				Event window
	CAR	*t-stat*			CAR	*t-stat*			CAR	*t-stat*			
		Standard	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*		*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*		*Standard*	*Boehmer Adj.*	*Cross-sectional Adj. (Crude Adj.)*	
[-9;-1]	-1,18%	-0,86	-0,81	-0,58	1,57%	0,73	0,84	0,53	0,08%	0,05	0,06	0,03	**[-9;-1]**
[-5;-1]	0,02%	0,02	0,02	0,01	0,38%	0,24	0,27	0,17	0,56%	0,46	0,57	0,28	**[-5;-1]**
[1;5]	2,74%	2,68 (***)	2,36 (**)	1,81 (*)	2,06%	1,29	1,05	0,92	3,17%	2,62 (***)	2,34 (**)	1,59	**[1;5]**
[1;10]	2,65%	1,83 (*)	1,65 (*)	1,24	2,35%	1,04	0,85	0,74	2,96%	1,73 (*)	1,56	1,05	**[1;10]**
[0;5]	3,17%	2,82 (***)	2,45 (**)	1,91 (*)	1,58%	0,91	0,78	0,65	3,78%	2,85 (***)	2,65 (***)	1,73 (*)	**[0;5]**
[0;10]	3,08%	2,02 (**)	1,82 (*)	1,37	1,87%	0,79	0,67	0,57	3,57%	1,98 (**)	1,84 (*)	1,21	**[0;10]**

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

Table 9

F test for equality of two population variances (variance in the event window *vs* variance in the estimation window) [Stress Test 15-07-2011]

Panel A: Raw returns – Percentage of cases where the null hypothesis is rejected

A1: σ^2 (Event) > σ^2 (EW)

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	13,5%	2,3%	4,1%	26,9%	14,0%	29,2%
Treatment group	7,8%	0,0%	5,9%	41,2%	21,6%	41,2%
Control group	15,8%	3,3%	3,3%	20,8%	10,8%	24,2%
Class C	20,0%	0,0%	0,0%	20,0%	20,0%	20,0%
Class B	0,0%	0,0%	11,1%	55,6%	22,2%	55,6%
Class A	8,1%	0,0%	5,4%	40,5%	21,6%	40,5%

A2: σ^2 (Event) < σ^2 (EW)

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	8,6%	4,4%	7,7%	11,7%	7,6%	10,5%
Treatment group	5,9%	3,9%	2,0%	0,0%	2,0%	0,0%
Control group	9,2%	4,2%	9,2%	15,8%	9,2%	14,2%
Class C	20,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Class B	11,1%	11,1%	0,0%	0,0%	0,0%	0,0%
Class A	2,7%	2,7%	2,7%	0,0%	2,7%	0,0%

Panel B: Abnormal returns – Percentage of cases where the null hypothesis is rejected

B1: σ^2 (Event) > σ^2 (EW)

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	11,1%	1,8%	3,5%	16,4%	8,2%	19,9%
Treatment group	3,9%	0,0%	3,9%	27,5%	5,9%	29,4%
Control group	14,2%	2,5%	3,3%	11,7%	9,2%	15,8%
Class C	20,0%	0,0%	0,0%	0,0%	0,0%	20,0%
Class B	0,0%	0,0%	11,1%	44,4%	11,1%	44,4%
Class A	2,7%	0,0%	2,7%	27,0%	5,4%	27,0%

B2: σ^2 (Event) < σ^2 (EW)

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	13,5%	11,7%	13,5%	17,5%	13,5%	16,4%
Treatment group	5,9%	2,0%	2,0%	2,0%	2,0%	2,0%
Control group	16,7%	15,8%	18,3%	24,2%	18,3%	22,5%
Class C	40,0%	20,0%	20,0%	20,0%	20,0%	20,0%
Class B	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Class A	2,7%	0,0%	0,0%	0,0%	0,0%	0,0%

Table 10

Structural break test in the GARCH (1,1) volatility: Percentage of financial stocks without stability in the variance equation [Stress Test 15-07-2011]

Panel A: Higher volatility

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	13,5%	17,5%	15,8%	18,1%	16,4%	17,5%
Treatment group	21,6%	29,4%	31,4%	31,4%	31,4%	31,4%
Control group	10,0%	12,5%	9,2%	12,5%	10,0%	11,7%
Class C	20,0%	20,0%	0,0%	0,0%	0,0%	0,0%
Class B	22,2%	44,4%	66,7%	55,6%	44,4%	55,6%
Class A	21,6%	27,0%	27,0%	29,7%	32,4%	29,7%

Panel B: Lower volatility

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	20,5%	25,1%	24,6%	17,5%	23,4%	19,9%
Treatment group	15,7%	19,6%	7,8%	7,8%	7,8%	5,9%
Control group	22,5%	27,5%	31,7%	21,7%	30,0%	25,8%
Class C	40,0%	40,0%	40,0%	40,0%	20,0%	40,0%
Class B	0,0%	0,0%	11,1%	11,1%	11,1%	0,0%
Class A	16,2%	21,6%	2,7%	2,7%	5,4%	2,7%

Table 11

StT-test: variance ratio (VR = event window variance / estimation window variance) equal to 1 [Stress Test 15-07-2011]

Panel A: Raw returns

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	5,00 (***)	3,80 (***)	1,44	1,59	1,60	1,73 (*)
Treatment group	3,55 (***)	3,50 (***)	8,11 (***)	8,23 (***)	8,17 (***)	8,01 (***)
Control group	4,01 (***)	3,00 (***)	1,22	1,28	1,38	1,42
Class C	0,58	-0,43	1,12	1,26	0,98	1,14
Class B	2,01 (**)	1,85 (*)	3,74 (***)	4,97 (***)	3,93 (***)	4,83 (***)
Class A	3,81 (***)	3,26 (***)	6,86 (***)	6,98 (***)	6,94 (***)	6,78 (***)

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

Panel B: Abnormal returns

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	3,94 (***)	3,09 (***)	1,28	1,36	1,44	1,52
Treatment group	2,02 (**)	2,41 (**)	6,20 (***)	6,08 (***)	6,20 (***)	5,97 (***)
Control group	3,48 (***)	2,68 (***)	1,14	1,17	1,30	1,33
Class C	0,71	0,25	0,87	0,69	0,88	0,78
Class B	0,67	0,89	2,06 (**)	2,45 (**)	1,93 (*)	2,38 (**)
Class A	2,13 (**)	2,28 (**)	5,26 (***)	5,43 (***)	5,33 (***)	5,31 (***)

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

Table 12

Beavers' U Test [Stress Test 15-07-2011]

	[-9;-1]	[-5;-1]	[1;5]	[1;10]	[0;5]	[0;10]
Full sample	4,07 (***)	4,73 (***)	38,68 (***)	15,54 (***)	34,58 (***)	15,59 (***)
Treatment group	4,94 (***)	1,54	8,25 (***)	1,73 (*)	5,30 (***)	0,94
Control group	1,64	4,64 (***)	40,79 (***)	17,42 (***)	37,83 (***)	17,99 (***)
Class C	4,82 (***)	1,61	0,64	0,60	-0,68	-0,34
Class B	0,16	0,04	2,26 (**)	1,00	1,64	0,42
Class A	3,96 (***)	1,19	8,34 (***)	1,32	5,67 (***)	1,03

***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively

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