The Reaction of Swiss Banks' Stock Prices to the Russian Crisis

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1. INTRODUCTION

On August 17, 1998, Russia announced a debt moratorium, after several weeks of tension on the rouble exchange rate and on the Russian Treasury Bill market. The Russian financial collapse was one more episode in the financial turmoil that affected emerging market economies after the floating of the Thai baht in mid-1997. The spreading crisis in emerging markets raised concerns about the financial stability of a number of Western and Japanese creditor banks. Fears of a crisis culminated in September 1998 with the debacle of the hedge fund *LTCM*. Some analysts pointed out the risk of a contagion among international banks and, also, the systemic repercussions that the failure of a large creditor bank might have on the domestic banking sector of its home country. Investors' loss of confidence led to a 30 % drop in the stock markets of developed countries during the third quarter of 1998.

The issues of contagion and systemic risk have a particular dimension in Switzerland for two reasons. First, the Swiss banking sector exhibits a high concentration in international comparison. This is especially true for the domestic interbank market, where the two big banks represent about 65 % of total liabilities. Secondly, the two big Swiss banks are highly involved in international banking and have been significantly affected by the Russian crisis and the *LTCM* debacle.

The Federal Banking Commission, which is in charge of banking supervision in Switzerland, has expressed its concerns about systemic risk on several occasions. In 1998, the Commission reacted to the merger between UBS and SBC by creating a special group responsible for the supervision of the two remaining big banks.[1] The Federal Banking

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1. HAURI (1998).

Commission proposed to impose higher capital requirements on large banks to compensate for their contribution to systemic risk.[2] The relevance of systemic risk for the Swiss banking system has been challenged by SHELDON and MAURER (1998). The authors try to assess the potential for systemic risk by looking at interbank lending relationships in Switzerland. Their results indicate that the chances of a bank failure propagating itself through the banking system are quite low. The authors, however, signal several elements that should prevent the reader from being too comfortable with their results. First, their analysis concentrates on a chain reaction caused by a single idiosyncratic shock. Secondly, confronted with shortcomings in their data, the authors fill the gaps concerning banks' individual positions by making assumptions that rule out clumped risk. In her discussion of this study, TERBERGER-STOY (1998) concludes that SHELDON's and MAURER's results are biased toward the lower bound of systemic risk.

Potential contagion effects can also be inferred from real life financial crises. This alternative approach consists of investigating whether an adverse event concerning one bank or one group of banks also affects other financial institutions not directly exposed to that event. Contagion effects are generally measured using banks' equity returns observed on the days surrounding the event under review. The existing literature using this approach concentrates on a number of US banks failures and on two main international financial crises, Mexico's moratorium in 1982 and Brazil's default announcement in 1987. The survey by KAUFMAN (1996), that essentially covers studies on US banks failures, indicates that the stock market successfully discriminated among banks according to their exposure to the adverse event; evidence for contagion is rare and limited to banks operating in the same market or area as the initially hit bank. Studies covering international financial crises provide more balanced evidence, although most of them also focus on US banks. CORNELL and SHAPIRO (1986) find that investors were able to distinguish between banks with varying degrees of Latin loan exposures following Mexico's 1982 moratorium and they reject the contagion hypothesis. For the same event, however, BRUNER and SIMMS (1987) do not reject the contagion hypothesis for the first four days of the crisis. For the Brazilian default announcement in 1987, MUSUMECI and SINKEY (1990) reject the contagion hypothesis, while KARAFIATH, MYNATT and SMITH (1991) find some evidence signalling a contagion effect among banks of similar size. Finally, KILIC, HASSAN and TUFTE (1998) find evidence for contagion effects following the Mexican Peso crisis.

In this paper, we try to detect contagion effects within the Swiss banking sector by examining the impact of the Russian's moratorium on Swiss banks' stock prices. We chose to concentrate our research on Russia's recent financial collapse for two reasons. First, one big Swiss bank, Credit Suisse First Boston, was frequently mentioned in newspapers for having a large exposure to Russia and it reported a $1 billion loss in its operations related to that country. Secondly, the Russian moratorium is the first major

2. ZUBERBÜHLER (1999).

financial crisis for which we dispose of data on banks' country exposure on a consolidated basis.[3]

To our knowledge, this study is the first to examine possible contagion effects among banks in the context of the Russian moratorium. Our work also contributes to empirical evidence on bank contagion effects outside the United States.

We proceed in two steps to measure the impact of the Russian financial collapse on Swiss banks and to detect possible contagion effects. First, using event study methodology, we compute Swiss banks' stock returns for a number of events related to the Russian moratorium. In a second step, we regress individual banks' stock returns on their Russian exposure to determine whether the Russian moratorium lead to a general loss of confidence in Swiss banks (contagion hypothesis) or whether investors successfully discriminated between banks according to their exposure to Russia (individual exposure hypothesis).

The paper is organised as follows. Section 2 presents the competing hypotheses that may be put forth to explain the reaction of Swiss banks' stocks prices. Section 3 provides a detailed chronology of the Russian crisis. In section 4, we introduce the event analysis methodology and the cross section regression model used for testing the competing hypotheses. In section 5, we present the results of the event study and of the regression analysis. Section 6 concludes.

2. COMPETING HYPOTHESES ON INVESTORS' REACTION

We distinguish the following hypotheses concerning possible investors' reaction to Russia's financial collapse:

- *The individual exposure hypothesis:* Under this hypothesis, the Russian moratorium would affect only Swiss banks that are directly exposed to Russia, while the rest of the Swiss financial system would remain unaffected. In this case, the reaction of each bank stock price should be proportional to that bank's Russian exposure. Such a configuration supposes that (i) investors correctly incorporate in equity prices publicly available information on the moratorium and on Swiss banks' exposure to Russia and (ii) Swiss banks directly affected by the Russian moratorium can still honour their domestic interbank liabilities.
- *The contagion hypothesis:* Under this hypothesis, the Russian moratorium would generate contagion effects affecting the Swiss financial system in general. Two major types of contagion can be distinguished. First, the Russian moratorium may cause a loss of confidence in the Swiss financial system as a whole, if a major Swiss bank suffers important losses in its Russian exposure and threatens to default on its domestic

3. It would have been interesting to extend our analysis to the LTCM debacle, given its significant impact on another large Swiss bank, UBS. Unfortunately, our information on Swiss banks' exposure to LTCM is limited to the two large banks.

interbank liabilities. As a result investors may sell off shares of all Swiss banks' stocks due to the perceived increase in their risk. It is important to state that this type of contagion effect is compatible with the semi-strong form efficient market hypothesis, since the reduction in the value of all Swiss banks' stocks would be a rational response to this greater risk of default on domestic as well as on Russian liabilities. Secondly, in the absence of official information on each bank's exposure, one can imagine an "intra-category" contagion, where investors consider that banks belonging to the same category are equally exposed to the Russian crisis. In the Swiss case, investors may consider that big banks and foreign and investment banks, because of their international orientation, are very likely to have a larger exposure to Russia than cantonal banks, whose core business is domestic. The result can be a sell off of all big and foreign and investment bank stocks.

Authors applying event study methodology to the banking sector traditionally distinguish two main hypotheses regarding investors' reaction to unexpected adverse events: the efficient market hypothesis and the contagion hypothesis.[4] We chose not to make this distinction since the first type of contagion considered above is compatible with the efficient market hypothesis.

3. CHRONOLOGY OF THE RUSSIAN MORATORIUM

In this section, we try to identify the events related to the Russian moratorium that are more likely to have affected Swiss banks' stock prices.

The last annual report of the Bank for International Settlements (1999, p. 50–54) provides a well-structured chronology of the Russian moratorium. "During the first half of 1998, difficulties in controlling public finances, the rising pace of short term government debt issuance, falling commodity prices and real exchange rate appreciation cast increasing doubt on Russia's debt servicing capabilities. As a result, the exchange rate suffered repeated attacks that were met by successive increases in interest rates to 150 % by end-May. To buttress rouble stability, which had been a centrepiece of monetary policy for some years, an international financial package of $23 billion was offered to Russia in July. However, given the strong parliamentary opposition to key-revenue raising measures, implementing IMF's adjustment programme was very difficult. Reserve losses continued and an attempt to lengthen the very short-term maturity of government debt failed, leaving almost $20 billion of short term rouble debt to mature before the end of the year. In addition, equity prices reached historical lows, domestic interest rates stayed high and spread on Russian eurobonds exploded. Faced with mounting domestic and external financing problems, the Russian authorities announced a radical policy shift in August 1998. The main measures included the widening and subsequent abandonment

4. See AHARONY and SWARY (1983), KARAFIATH et al. (1991) and DOCKING et al. (1997).

of the exchange rate band, the suspension of Russian Treasury bill trading (RTB), combined with a mandated restructuring of government debt, and a 90 days moratorium. In September, western banks began discussions with Russia on the debt restructuring. They were followed in November by an agreement on the general principles of the debt restructuring. In December however, western creditors rejected Russia rouble debt deal, and Russia announced unilaterally the terms of the debt restructuring. By end-1998, Russia was failing to meet payment on its more than $100 billion foreign currency debt inherited from the Soviet Union."

A parallel chronology can be established for Swiss banks' announcements regarding their exposure, loss and provisioning related to Russia. UBS reported on August 25 a net exposure of $0.4 billion and trading losses for $0.2 billion. On August 26, Credit Suisse Group (CSG), the parent holding company of Credit Suisse First Boston, recognised that Russia would weigh on its profit, after rumours had circulated among traders on its Russian exposure. On September 9, CSG announced an exposure of $2.2 billions and a provisioning of $1.1 billion.

By combining the BIS survey with Reuters' archives, we obtain a list of "key events" related to the Russian financial collapse. Table 1 recapitulates these events with an indication of their expected impact on Swiss banks' stocks.

Table 1: Events surrounding the Russian moratorium

Date	Event	expected impact
26.05.	TB interest up by 23 %	–
27.05.	Discount rate tripled to 150 %	–
14.07.	TB interest rates down by 135 %	+
11.08.	TB interest rates up by 74 %	–
14.08.	Several Russian banks fail on interbank payments	–
17.08.	Moratorium, government abandons rouble floor	–
20.08.	Rumours over CSG exposure	–
25.08.	UBS announces net exposure and $0.2 billion loss	?
26.08.	CSG says Russia woes weigh on profits	–
27.08.	Worst depreciation of rouble	–
31.08.	Duma rejects Chernomyrdin	?
09.09.	CSG details exposure and provisions	–
10.09.	Yeltsin nominates Primakov	?
17.09.	Talks between banks and Russia on TB	+
20.11.	Principle agreement between Russia and creditor banks	+
25.11.	IMF criticises Russia's reforms	–
10.12.	Banks reject debt restructuring	–

Source: Reuters' archive

We expect increases in RTB interest rates and in the central bank's discount rate to have a negative impact on banks' stocks, as they reflect the tensions on the rouble exchange rate as well as investors' preoccupations concerning Russia's debt servicing capabilities. The moratorium announcement, if not anticipated by investors, may also negatively affect banks' stock returns. Likewise, we expect the failure of several Russian banks to have a negative impact on Swiss banks' stocks, as this event made clear that the Russian banking system was seriously hit by the adverse developments on the RTB market and on the rouble market. Regarding the negotiation between Russia and its creditor banks, we expect the start of the talks and the announcement of a principle agreement to have a positive impact on Swiss banks' stocks. Banks' rejection of the terms of the debt restructuring, conversely, may have affected banks' stocks negatively as it destroyed hopes of a rapid resolution of the crisis. We make no a priori assumption about the impact of political events such as the Duma's rejection of Chernomyrdin and Yeltsin's nomination of Primakov.

Regarding news on Swiss banks, we expect rumours on CSG's Russian exposure and the announcement by CSG of its substantial losses in Russia to negatively affect banks' stock returns. UBS' announcement of its rather small Russian losses, conversely, may be considered good news and we expect this event to affect stock returns in a positive direction.

4. DATABASE AND METHODOLOGY

We use a two-step approach to examine the impact of the Russian crisis on the share prices of Swiss banks. First, we apply event study methodology to compute daily and cumulative equity returns for the two big banks, for a portfolio of cantonal banks and for a portfolio of foreign and investment banks for each event of the Russian crisis. The purpose of this first step is to determine whether the Russian crisis coincided with significant moves in Swiss banks' stock prices and to identify the bank categories that have been affected the most. In a second step, we compute daily equity returns for each individual bank and we regress them against the bank's exposure to Russia. The purpose of this second step is to discriminate between the individual exposure and the contagion hypotheses described in section 2.

4.1. Database

The data sample covers all Swiss domiciled banks whose equity is traded at the Swiss Stock Exchange (17 observations). We distinguish three categories of banks: the big banks, the cantonal banks and the foreign and investment banks.

4.2. Event analysis methodology

We apply event study methodology to determine the magnitude of stock market reaction to events related to Russia's moratorium. Following CORNELL and SHAPIRO (1986), we use two measures of return.[5] The first measure is the excess return as estimated from the capital asset pricing model (CAPM). The second measure is simply the raw return. The excess return approach has the advantage of relying on a theoretical basis. The results obtained with this approach may however be sensitive to the choice of the risk-free asset and of the market index. The raw returns approach, which does not rely on a theoretical foundation, is used to test the robustness of the results.

4.2.1. Excess return approach

The first step of the event analysis based on excess returns, consists of the estimation of a CAPM equation:

$$R_{i,t} = R_{f,t} + \beta_i \cdot (R_{m,t} - R_{f,t}) + \varepsilon_{i,t} \tag{1}$$

where $R_{i,t}$ is the daily return on the stock of the bank i on day t,
$R_{m,t}$ is the daily return on the stock market (Swiss Performance Index[6]) on day t,
$R_{f,t}$ is the daily return on the risk-free asset (Confederation's short term debt[7]) on day t,
β_i is the beta of the stock of bank i and
$\varepsilon_{i,t}$ is an error term.
The model is estimated over the time interval starting on 1/1/1997 and ending on 31/12/1998.

Excess returns for each bank or portfolio i are calculated for each event-day as the difference between the observed return and the expected return:

$$ER_{i,t} = R_{i,t} - (R_{f,t} + \hat{\beta}_i \cdot (R_{m,t} - R_{f,t})) = \varepsilon_{i,t} \tag{2}$$

Standardised excess returns $SER_{i,be}$ or t-values are obtained by dividing the excess return on day t by the standard deviation of excess returns over the estimation period:

$$SER_{i,be} = \frac{ER_{i,be}}{SD(ER_{i,be})} \tag{3}$$

Cumulative returns $CER_{i,be}$ over a particular time interval are computed as

5. A third approach consists of regressing observed returns on an intercept and on a market index in order to obtain "abnormal returns".
6. Source: Datastream.
7. Source: Swiss National Bank.

$$CER_{i,bc} = \sum_{t=b}^{c} ER_{i,t} \tag{4}$$

for the interval beginning on day $t = b$ and ending on day $t = e$.
The cumulative standardised excess return $SCER_{i,bc}$ equals:

$$SCER_{i,bc} = \frac{CER_{i,bc}}{SD(CER_{i,bc})} \tag{5}$$

The standard deviation $SD(CER_{i,bc})$ is estimated as:

$$SD(CER_{i,bc}) = \left[T \cdot \mathrm{Var}(ER_i) + 2(T-1) \cdot \mathrm{Cov}(ER_{i,t}, ER_{i,t-1})\right]^{0.5} \tag{6}$$

where T represents the number of trading days in the interval $T = e - b + 1$. This standard deviation measurement controls for the autocorrelation of returns that may result from event-clustering.[8]

4.2.2. Raw returns methodology

Within this approach, we directly look at the raw return $R_{i,t}$ occurring on a given day or time interval. To determine whether the raw return is significant or not, we calculate the raw standardised returns as

$$SR_{i,bc} = \frac{R_{i,bc}}{SD(R_{i,bc})} \tag{7}$$

where $SD(R_{i,bc})$ is the standard deviation of raw returns over the estimation period.

Cumulative raw returns $CR_{i,bc}$ and cumulative standard raw returns $SCR_{i,bc}$ are calculated following the procedure described above for excess returns.

4.2.3. Robustness checks based on the event parameter approach

The methodology described in the previous section has been used in the majority of event studies. Recent applications of this "traditional" approach can be found in Docking et al. (1997) and Slovin, Sushka and Polonchek (1999). An alternative approach, developed by Binder (1985) and used by Karafiath et al. (1991) and Brewer, Genay, Hunter, and Kaufman (2000), consists of adding a vector of dummy variables to the right-hand side of the CAPM or of the market model. The dummy variable is unity for

8. See Ruback (1982), Brunner and Simms (1987) and Madura et al. (1991).

the event-day and zero otherwise. The estimated coefficient of the dummy variable can then be used to compute prediction errors – such as excess returns – over the desired time window.

We use the event parameter approach as a robustness check. To compute excess returns based on the CAPM, we estimate the following equation for each bank or bank category:

$$R_{i,t} = R_{f,t} + \beta_i \cdot (R_{m,t} - R_{f,t}) + \sum_{s=1}^{17} \tau_{i,s} \cdot D_{s,t} + \varepsilon_{i,t} \tag{8}$$

where $D_{s,t}$ is a dummy variable that is set equal to one on the day of event s (we identified 17 events) and is zero otherwise, and $\tau_{i,s}$ is the estimate of the coefficient on the dummy variable $D_{s,t}$ for event s.

The above equation is estimated for all banks or bank categories over the time interval starting on 1/1/1997 and ending on 31/12/1998, using SUR regression. The t-value of the dummy coefficient is used to assess the significance of the excess return. Using a Wald-test, we can test the equality of the coefficients of the dummy terms across the equations estimated for each bank or bank category. This approach enables us to test rigorously whether bank stocks reacted differently to a given event.

By analogy, under the event parameter approach, raw returns are estimated using the following equation:

$$R_{i,t} = \sum_{s=1}^{17} \tau_i \cdot D_{s,t} + \varepsilon_{i,t} \tag{9}$$

4.3. Cross sectional regression analysis

We estimate two models that are supposed to explain raw or excess returns on Swiss banks' stocks: the *exposure model* and the *bank category model.*

4.3.1. Exposure model

We use the exposure model to test whether stock market reaction to the moratorium exhibited systemic characteristics signalling possible contagion effects, or whether it reflected Swiss banks' individual exposure to Russia. In this model,we regress each bank's raw or excess return on an intercept and on a variable reflecting the bank's exposure to Russia:

$$R_{i,bc} \text{ or } ER_{i,bc} = \alpha_0 + \alpha_1 \cdot EXP_i + v_{i,bc} \tag{10}$$

where EXP_i measures the bank's exposure to Russia as a percentage of its capital. EXP_i includes on- and off-balance sheet positions, after deduction of collateral, and stems from the Swiss National Bank databank. Since our exposure measure is not accessible to the public, its ability to explain investors' reaction can be questioned. Our view here is that the reports published by ratings agencies and market analysts regarding Swiss banks' activities in Russia allowed the market to partially infer individual banks' exposure to that country. It is legitimate to argue, however, that EXP_i contains some measurement error regarding investors' information on Swiss banks' exposure at the time of the moratorium. As a robustness check, we also use a non-parametric test based on a contingency table to measure the relation between bank stock returns and their exposure to Russia.

In the cross section regressions, a significant coefficient on the exposure variable (negative for bad news and positive for good news) may indicate that the market discriminated between banks based on their exposure to Russia, and the individual exposure hypotheses cannot be rejected. Conversely, a significant intercept (negative for bad news and positive for good news) may indicate that Russian events affected Swiss banks in general, and the contagion hypothesis could not be rejected. We have to be careful with that interpretation, however, the intercept may also be a catchall for omitted variables. The regression approach presented here has been used by CORNELL et al. (1986) and BRUNNER et al. (1987) for Mexico's moratorium in 1982, and by MUSUMECI et al. (1990) and KARAFIATH et al. (1991) for Brazil's default announcement in 1987. All these studies focus on US banks.

4.3.2. Bank category model

We use the *bank category model* to evaluate how a bank's belonging to a given category explains the reaction of that bank's stock to the Russian moratorium. In this model, we regress banks raw or excess returns against dummy variables reflecting the category of the bank:

$$R_{i,bc} \text{ or } ER_{i,bc} = \gamma_1 \cdot BIG_i + \gamma_2 \cdot CAN_i + \gamma_3 \cdot FI_i + v_{i,bc} \tag{11}$$

where BIG_i is unity for big banks and zero otherwise, CAN_i is unity for cantonal banks and zero otherwise, FI_i is unity for foreign and investments banks and zero otherwise.

The finding of significant differences between the dummy variables would be compatible with the individual exposure hypothesis as well as with the intra-category contagion hypothesis, because banks' exposure to Russia varies significantly across bank categories. However, should the *bank category model* have a higher explanatory power than the *exposure model,* we could not reject the hypothesis that, in the absence of official information on individual banks' exposure, investors mainly discriminate between banks according to their category. This would be consistent with the intra-category contagion hypothesis.

5. RESULTS

5.1. Stock event analysis

In this section, we compute daily and cumulative bank equity returns for each key event inventoried in our chronology of Russia's financial collapse. The purpose of this stock event analysis is to determine whether the Russian financial collapse coincided with significant moves in Swiss banks' stock prices and to identify the bank categories that were most affected. To save space, we limit our discussion of the results to the stock event analysis based on raw returns.

5.1.1. Did the Russian financial collapse impact on Swiss banks' stock price?

Table 2a presents the raw returns both by event-day and cumulated from the start of the tensions on the RTB market. Their standardised values are in parentheses. The results are presented separately for UBS, CSG, a portfolio of cantonal banks and a portfolio of foreign and investment banks (equally weighted portfolios).

With regard to the commencement of the crisis, our results indicate that early increases in RTB interest rates and the tripling of the central bank's discount rate in May 1998 did not affect Swiss bank stock prices significantly. The 74% rise in RTB rates in August, however, coincided with significant negative returns for all Swiss bank categories.

The failure of several major Russian banks on the interbank market and the announcement of the moratorium had no significant impact on Swiss banks' stocks. A possible interpretation for this absence of reaction is that investors had anticipated the moratorium and the disruption of the interbank market, given the tensions observed on the RTB and the rouble markets. The 17% depreciation of the rouble in late August coincided with significant negative returns for the two big banks.

Surprisingly, the start of the discussions between creditor banks and Russia coincided with significant negative returns for the two big banks. A possible explanation for this negative reaction could be that investors interpreted the announcement of the negotiation as a confirmation of the seriousness of the crisis. The announcement of a principle agreement between Russia and its creditors in November coincided with positive and significant returns for the two big banks. Conversely, CSG's shares were affected negatively by Western banks' rejection of the debt restructuring and by Russia's unilateral announcement of the restructuring terms in December.

Table 2a: raw returns and their standardized values derived from traditional event methodology

Date	Event	Daily returns				Cumulative returns			
		CSG	UBS	CAN	FI	CSG	UBS	CAN	FI
26.05.	TB interest up by 23 %	0.008 (0.39)	0.004 (0.25)	0.003 (0.50)	0.009 (0.95)				
27.05.	Discount rate tripled to 150 %	−0.020 (−1.01)	−0.023 (−1.49)	−0.002 (−0.45)	−0.005 (−0.52)				
14.07.	TB interest rates down by 135 %	−0.001 (−0.07)	−0.014 (−0.90)	0.001 (0.16)	0.020* (2.13)				
11.08.	TB interest rates up by 74 %	−0.051* (−2.66)	−0.048* (−3.05)	−0.011* (−2.02)	−0.047* (−5.15)	−0.051* (−2.66)	−0.048* (−3.05)	−0.011* (−2.02)	−0.047* (−5.15)
14.08.	Some Russian banks fail on interbank payments	0.011 (0.55)	0.032* (2.04)	−0.002 (−0.40)	0.033* (3.56)	−0.027 (−0.70)	−0.008 (−0.24)	−0.009 (−0.84)	−0.025 (−1.24)
17.08.	Moratorium, governments abandons rouble floor	−0.002 (−0.08)	−0.014 (−0.88)	0.003 (0.58)	−0.017 (−1.91)	−0.028 (−0.66)	−0.022 (−0.57)	−0.006 (−0.50)	−0.042 (−1.90)
20.08.	Rumours over CSG exposure	−0.046* (−2.38)	−0.040* (−2.56)	0.000 (−0.08)	−0.007 (−0.75)	−0.087 (−1.62)	−0.062 (−1.26)	0.010 (0.61)	−0.038 (−1.34)
25.08.	UBS announces net exposure and 0.2 loss	0.019 (0.97)	0.035* (2.22)	0.000 (0.02)	0.013 (1.45)	−0.129* (−2.03)	−0.086 (−1.50)	−0.014 (−0.75)	−0.088* (−2.65)
26.08.	CSG says Russia woes weigh on profits	−0.045* (−2.35)	−0.024 (−1.55)	−0.007 (−1.25)	−0.048* (−5.23)	−0.174* (−2.63)	−0.110 (−1.84)	−0.021 (−1.07)	−0.136* (−3.92)
27.08.	Worst depreciation of rouble	−0.082* (−4.28)	−0.052* (−3.30)	−0.011 (−1.93)	−0.061* (−6.63)	−0.257* (−3.73)	−0.161* (−2.59)	−0.031 (−1.54)	−0.197* (−5.44)
31.08.	Duma rejects Chernomyrdin	−0.032 (−1.68)	−0.027 (−1.73)	0.000 (−0.04)	−0.025* (−2.68)	−0.287* (−3.88)	−0.223* (−3.32)	−0.039 (−1.79)	−0.221* (−5.70)
09.09.	CSG details exposure and provisions	−0.131* (−6.80)	−0.045* (−2.89)	−0.001 (−0.21)	0.004 (0.46)	−0.445* (−4.97)	−0.194* (−2.38)	−0.037 (−1.40)	−0.238* (−5.06)
10.09.	Yeltsin nominates Primakov	−0.066* (−3.42)	−0.084* (−5.37)	−0.011* (−1.97)	−0.048* (−5.21)	−0.511* (−5.58)	−0.278* (−3.34)	−0.048 (−1.77)	−0.286* (−5.94)
17.09.	Talks between banks and Russia on TB	−0.108* (−5.58)	−0.068* (−4.32)	−0.001 (−0.21)	−0.014 (−1.51)	−0.562* (−5.56)	−0.324* (−3.53)	−0.049 (−1.62)	−0.259* (−4.86)
20.11.	Principle agreement between Russia and banks	0.050* (2.60)	0.041* (2.62)	−0.002 (−0.35)	0.035* (3.82)	−0.331* (−2.02)	−0.262 (−1.75)	−0.056 (−1.15)	−0.129 (−1.49)
25.11.	IMF criticises reforms	−0.029 (−1.49)	−0.022 (−1.41)	−0.002 (−0.33)	−0.005 (−0.50)	−0.279 (−1.66)	−0.258 (−1.69)	−0.051 (−1.02)	−0.117 (−1.32)
10.12.	Banks reject debt restructuring	−0.070* (−3.61)	−0.013 (0.33)	0.000 (−0.04)	0.000 (−1.36)	−0.443* (−2.47)	−0.324* (−1.99)	−0.062 (−1.16)	−0.133 (−1.41)

Notes: The standardised returns or t-values are in parentheses. * significant at the 0.05 level.

As far as political events are concerned, the Duma's rejection of Chernomyrdin did not affect Swiss banks' stocks, while Yeltsin's nomination of Primakov coincided with significant and negative returns for all Swiss bank categories. Investors' negative reaction may be explained by Primakov's sympathy for a return to a system of planned economy.

As to bank specific news, our results indicate that rumours of CSG's exposure to Russia were accompanied by negative and significant returns for the two big banks' stocks. UBS' announcement of its rather moderate exposure was followed by a positive and significant return on its shares. Conversely, CSG's first announcement that the Russian crisis would weigh on its profits coincided with a significant negative return of the bank's stocks. CSG's details on its Russian exposure and provisioning was followed by a very large negative return on the bank's own shares, while UBS also experienced a significant, although smaller negative return.

In table 2b, we present robustness checks based on the event parameter approach described in section 4.2.3. We obtain very similar results regarding the types of events that affected Swiss banks stock returns significantly.

5.1.2. Which banks were the more affected?

A cross category comparison of the results of the stock event analysis in table 2a indicates that CSG's shares were the most affected by the Russian financial collapse. UBS and foreign and investment banks' stock returns were affected less frequently and less significantly than CSG's shares. Cantonal banks' shares reacted significantly on two occasions only. This differentiation in market reaction seems at first sight reasonable, given the fact that CSG experienced more substantial losses than UBS in Russia and that cantonal banks, because of their domestic focus, are unlikely to have a significant exposure to Russia.

The right part of table 2a presents cumulative raw returns starting on August 11th. Cumulative raw returns reached their minimum at −0.576 for CSG (significant at the 1% level), −0.440 for UBS (significant at the 1% level), −0.321 for the foreign and investment banks portfolio (significant at the 1% level) and −0.066 (significant at the 5% level) for the cantonal banks portfolio. For the three categories of banks, the minimum coincides with the start of the talks between Russia and its creditor banks. The cumulative returns obtained for CSG and UBS indicate that the equity value of the two big banks measured at market dropped by almost 50% during the most turbulent phase of the Russian crisis. This evolution seems quite impressive when compared to the losses announced by the two big banks for their Russian operations, which represented "only" 7% of CSG's equity and 1% of UBS' equity.

Using the event parameter approach, it is possible to test the equality of the coefficients of the dummy terms across the equations estimated for each bank or bank category. This allows us to test rigorously whether bank stocks (or groups of them) reacted differently to a same event. Table 3 presents, for each event, the p-values derived from a Wald-test of the hypothesis that the dummy coefficients are equal across banks or

bank groups. The results indicate that CSG's stock price reaction was significantly differ ent from cantonal banks' stock price reaction for 7 out of 17 events, and it was also sig nificantly different from UBS' stock price reaction for 3 events. UBS' stock price reac tion was different from cantonal banks' stock price reaction for 3 events. These result confirm the existence of substantial differences across banks in the reaction of thei stock price to the Russian moratorium.

Table 2b: raw returns and their t-values derived from the event parameter approach

Date	Event	Daily returns			
		CSG	UBS	CAN	FI
26.05.	TB interest up by 23 %	0.008	0.004	0.003	0.009
		(0.31)	(0.18)	(0.51)	(0.71)
27.05.	Discount rate tripled to 150 %	−0.020	−0.023	−0.002	−0.005
		(−0.81)	(−1.05)	(−0.46)	(−0.39)
14.07.	TB interest rates down by 135 %	−0.001	−0.014	0.001	0.020
		(−0.06)	(−0.63)	(0.16)	(1.58)
11.08.	TB interest rates up by 74 %	−0.051*	−0.048*	−0.011*	−0.047*
		(−2.13)	(−2.15)	(−2.06)	(−3.83)
14.08.	Some Russian banks fail on interbank payments	0.011	0.032	−0.002	0.033*
		(0.44)	(1.44)	(−0.41)	(2.65)
17.08.	Moratorium, governments abandons rouble floor	−0.002	−0.014	0.003	−0.017
		(−0.06)	(−0.62)	(0.59)	(−1.42)
20.08.	Rumours over CSG exposure	−0.046	−0.040	0.000	−0.007
		(−1.90)	(−1.81)	(−0.09)	(−0.56)
25.08.	UBS announces net exposure and 0.2 loss	0.019	0.035	0.000	0.013
		(0.78)	(1.56)	(0.02)	(1.08)
26.08.	CSG says Russia woes weigh on profits	−0.045	−0.024	−0.007	−0.048*
		(−1.87)	(−1.09)	(−1.27)	(−3.89)
27.08.	Worst depreciation of rouble	−0.082*	−0.052*	−0.011*	−0.061*
		(−3.41)	(−2.32)	(−1.97)	(−4.93)
31.08.	Duma rejects Chernomyrdin	−0.032	−0.027	0.000	−0.025*
		(−1.34)	(−1.22)	(−0.04)	(−1.99)
09.09.	CSG details exposure and provisions	−0.131*	−0.045*	−0.001	0.004
		(−5.43)	(−2.03)	(−0.22)	(0.34)
10.09.	Yeltsin nominates Primakov	−0.066*	−0.084*	−0.011*	−0.048*
		(−2.73)	(−3.79)	(−2.01)	(−3.88)
17.09.	Talks between banks and Russia on TB	−0.108*	−0.068*	−0.001	−0.014
		(−4.46)	(−3.04)	(−0.22)	(−1.13)
20.11.	Principle agreement between Russia and banks	0.050*	0.041	−0.002	0.035*
		(2.08)	(1.84)	(−0.36)	(2.84)
25.11.	IMF criticises reforms	−0.029	−0.022	−0.002	−0.005
		(−1.19)	(−1.00)	(−0.33)	(−0.37)
10.12.	Banks reject debt restructuring	−0.070*	−0.013	0.000	0.000
		(−2.90)	(−0.57)	(0.04)	(−0.02)

Notes: The t-values are in parentheses. * significant at the 0.05 level.

Table 3: p-values for a Wald test of the null hypothesis of equality of the coefficient of the dummy terms across banks or bank categories (raw returns)

		UBS	CAN	FI
26.05	CSG	0.845	0.838	0.958
	UBS		0.959	0.807
	CAN			0.614
27.05	CSG	0.843	0.468	0.487
	UBS		0.340	0.348
	CAN			0.844
14.07	CSG	0.504	0.923	0.324
	UBS		0.495	0.089
	CAN			0.113
11.08	CSG	0.844	0.087	0.847
	UBS		0.093	0.984
	CAN			0.002*
14.08	CSG	0.259	0.584	0.301
	UBS		0.117	0.971
	CAN			0.003*
17.08	CSG	0.516	0.842	0.451
	UBS		0.437	0.849
	CAN			0.079
20.08	CSG	0.755	0.053	0.066
	UBS		0.069	0.092
	CAN			0.585
25.08	CSG	0.398	0.428	0.797
	UBS		0.113	0.277
	CAN			0.263
26.08	CSG	0.264	0.103	0.900
	UBS		0.425	0.229
	CAN			0.000*
27.08	CSG	0.101	0.002*	0.306
	UBS		0.060	0.641
	CAN			0.000*
31.08	CSG	0.776	0.170	0.711
	UBS		0.217	0.899
	CAN			0.039*
09.09	CSG	0.000*	0.000*	0.000*
	UBS		0.044*	0.012*
	CAN			0.649
10.09	CSG	0.339	0.019*	0.389
	UBS		0.001*	0.065
	CAN			0.002*
17.9	CSG	0.033*	0.000*	0.000*
	UBS		0.002*	0.006*
	CAN			0.280
20.11	CSG	0.622	0.027*	0.473
	UBS		0.049*	0.764
	CAN			0.002*
25.11	CSG	0.722	0.251	0.253
	UBS		0.352	0.373
	CAN			0.816
10.12	CSG	0.002*	0.003*	0.001*
	UBS		0.556	0.530
	CAN			0.968

Note: * significant at the 0.05 level.

5.1.3. Summary of the stock event analysis

The findings of our stock event analysis can be summarised as follows. First, Swiss banks stocks did not react to the announcement of the Russian moratorium itself, but have been negatively affected by the tensions in the RTB and the rouble markets. Here, a plausible interpretation is that the moratorium was not a surprise for investors, given the adverse financial and economic context. Secondly, the Russian financial collapse affected CSG's shares more than those of UBS and of the cantonal banks; this result seems consistent with the respective losses announced by the two big banks and with the low international profile of the cantonal banks. Third, the cumulative negative stock returns observed for the two big banks are much larger than the losses reported by these banks for their Russian operations. Here, a possible explanation is that investors, in a context of financial instability, feared that large banks could also suffer considerable losses on their exposure to other emerging markets.

5.2. Results of the cross section analysis

We now try to determine whether Swiss banks' stocks reaction to the Russian financial collapse reflected banks' individual exposure to Russia, as implied by the individual exposure hypothesis, or whether it exhibited systemic characteristics compatible with the contagion hypothesis. For this purpose, we estimate the *exposure model* and the *bank category model* for each bank and for each event characterised by a significant raw return or excess return. The two models are also estimated for a pool including all key events with separate coefficients for good and bad news.

Because of the heteroscedasticity in raw returns and excess returns, the t-statistics of the estimated coefficients may be biased. We address this problem by using the WHITE (1980) heteroscedasticity consistent covariance matrix estimator that provides correct t-statistics for the coefficient estimates in the presence of heteroscedasticity of unknown form.[9] To preserve the confidential character of the data on banks' exposures, we limit the presentation of the results obtained with the exposure model to the sign and the significance level of the estimated coefficients.

9. Actually, some information on the heteroscedasticity form could be extracted from the variance covariance matrix of the residuals obtained by estimating the CAPM model defined in sub-section 4.2.1. This information could then be used to build a generalised least squares estimator. Such an approach has been used by KARAFIATH and al. (1991) in their analysis of abnormal returns derived from the market model. The solution developed by KARAFIATH and al., however, cannot be applied to raw returns, as no initial equation (such as the CAPM or the market model) is estimated.

5.2.1. Relationship between raw returns, bank exposure and bank category

Table 4a presents the results of the cross section regression based on raw returns for each of the 12 events for which a significant raw return was observed. In the exposure model, we find that for three events, the intercept alone is significant and negative. For these events, the contagion hypothesis cannot be rejected. For five events, the exposure variable alone is significant (negative for four bad news and positive for one good news), which is compatible with the individual exposure hypothesis. For one event, both the intercept and the exposure variable are significant.

Table 4a: Cross section estimates based on raw returns derived from traditional event methodology

Date	Event	Exposure model			Bank category model			
		C	EXP	adj R2	BIG	CAN	FI	adj R2
11.08.	TB interest rates up by 74 %	negative* (0.00)	negative (0.19)	0.06	−0.05* (0.01)	−0.02 (0.06)	−0.04* (0.00)	0.16
20.08.	Rumours over CSG exposure	positive (0.27)	negative* (0.00)	0.53	−0.04* (0.00)	0.00 (0.55)	−0.01 (0.25)	0.49
25.08.	UBS announces exposure and 0.2 loss	positive (0.18)	positive (0.11)	0.12	0.03* (0.01)	0.00 (0.94)	0.02* (0.01)	0.36
26.08.	CSG announces Russia woes weigh on profits	negative* (0.01)	negative (0.40)	−0.02	−0.03* (0.04)	−0.01 (0.05)	−0.03* (0.01)	0.06
27.08.	27 % depreciation of rouble	negative* (0.00)	negative (0.20)	0.05	−0.07* (0.01)	−0.02 (0.05)	−0.06* (0.00)	0.33
31.08.	Duma rejects Chernomyrdin	negative (0.06)	negative (0.23)	0.04	−0.03* (0.02)	0.00 (0.55)	−0.03* (0.00)	0.36
09.09.	CSG details exposure	positive (0.79)	negative* (0.00)	0.64	−0.09* (0.00)	0.00 (0.63)	0.01 (0.30)	0.63
10.09.	Yeltsin nominates Primakov	negative* (0.01)	negative* (0.02)	0.28	−0.08* (0.00)	−0.02 (0.06)	−0.04* (0.01)	0.30
17.09.	Talks between banks and Russia on TB	negative (0.09)	negative* (0.00)	0.78	−0.09* (0.00)	0.00 (0.44)	−0.02* (0.03)	0.79
20.11.	Principle agreement between Russia and banks	positive (0.13)	positive* (0.01)	0.37	0.05* (0.00)	0.00 (0.72)	0.02* (0.01)	0.50
10.12.	Banks reject debt restructuring	positive (0.95)	negative* (0.01)	0.40	−0.04* (0.01)	0.00 (0.96)	0.00 (0.93)	0.34

Notes: In parentheses: p-values derived from a t-Student test based on White's coefficient covariance matrix. * significant at the 5 % level

Since the exposure variable is measured with error, we also used a non-parametric measure to examine the relationship between bank stock returns and their exposure to

Russia. For each event, we computed a contingency table between the raw returns observed for each bank and the measure of bank exposure. In table 4b, we report, for each contingency table, the Pearson χ^2 statistic of independence, the associated p-value for the null hypothesis of independence and the associated contingency coefficient. The contingency coefficient is defined as $\sqrt{\tilde{\chi}^2/(\tilde{\chi}^2 + N)}$, where N is the number of observations. A higher contingency coefficient indicates a stronger relation between the two variables in the table.

Using the Pearson χ^2 statistic and the associated p-values, we can reject the hypothesis of independence between bank raw returns and their Russian exposures for 7 out of the 9 events for which the cross section regression analysis indicated a significant relationship between the two variables. Hence, the results based on the parametric and on the non-parametric approaches are relatively consistent.

Table 4b: Non parametric measures of the relation between bank exposure and raw returns

Date	Event	Contingency coefficient	Pearson χ^2	p-value
11.08.	TB interest rates up by 74%	0.670	13.0	0.366
20.08.	Rumours over CSG exposure	0.792	26.9	0.008*
25.08.	UBS announces net exposure and 0.2 loss	0.734	18.7	0.770
26.08.	CSG says Russia woes weigh on profits	0.857	44.4	0.007*
27.08.	Worst depreciation of rouble	0.857	44.2	0.046*
31.08.	Duma rejects Chernomyrdin	0.716	16.8	0.538
09.09.	CSG details exposure and provisions	0.766	22.8	0.200
10.09.	Yeltsin nominates Primakov	0.822	33.3	0.099
17.09.	Talks between banks and Russia on TB	0.848	40.9	0.002*
20.11.	Principle agreement between Russia and banks	0.787	26.1	0.011*
10.12.	Banks reject debt restructuring	0.817	32.1	0.124

Note: * significant at the 0.05 level.

The right-hand side of table 4a presents the cross section estimate of the bank category model. The coefficient of the big bank dummy is negative and significant for all events except for the announcement of the principle agreement, where it is positive and significant. The coefficient of the cantonal bank dummy is negative and significant for two events only. The coefficient of the foreign and investment bank dummy is significant and negative for seven events, and positive and significant for the announcement of the principle agreement. The differences in amplitude between the dummy variables are significant and they indicate a strong differentiation in market reaction based on the bank's category. The comparison between the adjusted R-squared of the two models indicates that for a majority of events, the bank category model explains market reaction better than the exposure model.

5.2.2. Relationship between excess returns, bank exposure and bank category

Table 5a presents the models' estimates based on excess returns for each event. In the exposure model, we find that for four events, the intercept alone is significant and negative. For those days, the contagion hypothesis cannot be rejected.[10] For five events, the exposure variable alone is significant (negative for four bad news and positive for one good news), which is compatible with the individual exposure hypothesis.

Table 5a: Cross section estimates based on excess returns derived from traditional event methodology

Date	Event	Exposure model			Bank category model			
		C	EXP	adj R2	BIG	CAN	FI	adj R2
11.08.	TB interest rates up by 74%	negative* (0.02)	positive (0.73)	−0.07	−0.01 (0.54)	−0.01 (0.11)	−0.02* (0.05)	−0.09
17.08.	Moratorium	positive (0.73)	negative (0.85)	−0.08	0.00 (0.79)	0.00 (0.63)	−0.01 (0.18)	0.01
20.08.	Rumours over CSG exposure	positive (0.87)	negative* (0.00)	0.42	−0.03* (0.00)	0.00 (0.86)	0.00 (0.93)	0.36
25.08.	UBS announces exposure and 0.2 loss	positive (0.84)	positive (0.60)	−0.05	0.01 (0.49)	0.00 (0.54)	0.01 (0.21)	0.03
26.08.	CSG announces Russia woes weigh on profits	negative* (0.01)	positive (0.67)	−0.06	−0.01 (0.51)	−0.01 (0.06)	−0.02* (0.02)	−0.05
27.08.	27% depreciation of rouble	negative* (0.00)	positive (0.54)	−0.05	−0.01 (0.47)	−0.01 (0.06)	−0.04* (0.00)	0.26
31.08.	Duma rejects Chernomyrdin	negative (0.13)	negative (0.66)	−0.06	−0.01 (0.21)	0.00 (0.82)	−0.02* (0.01)	0.22
09.09.	CSG details exposure	positive (0.15)	negative* (0.00)	0.48	−0.06* (0.00)	0.00 (0.90)	0.03* (0.01)	0.60
10.09.	Yeltsin nominates Primakov	negative* (0.04)	negative (0.31)	0.01	−0.03 (0.07)	−0.01 (0.11)	−0.01 (0.15)	−0.07
17.09.	Talks between banks and Russia on TB	positive (0.13)	negative* (0.00)	0.69	−0.04* (0.00)	0.00 (0.36)	0.01 (0.24)	0.67
20.11.	Principle agreement between Russia and banks	positive (0.71)	positive* (0.05)	0.18	0.02* (0.03)	0.00 (0.66)	0.01 (0.18)	0.24
10.12.	Banks reject debt restructuring	positive (0.36)	negative* (0.04)	0.23	−0.02 (0.06)	0.00 (0.72)	0.01 (0.30)	0.19

Notes: In parentheses: p-values derived from a t-Student test based on White's coefficient covariance matrix. * significant at the 5% level

10. For these events, the results of RAMSEY (1969) specification test lead us to reject the hypothesis of omitted variables for the ratio of capital to total assets, total assets and return on assets.

As a first robustness check, we re-estimated the exposure model with the excess returns obtained from the dummy parameter approach described in section 4.2.3. The results are presented in table 5b. For 10 out of the 12 events considered, we obtain consistent results with regard to the significance of the constant and of the coefficient of the exposure variable.

Table 5b: Cross section estimates based on excess returns derived from the event parameter approach

Date	Event	Exposure model	
		C	EXP
11.08.	TB interest rates up by 74 %	negative* (0.02)	positive (0.73)
17.08.	Moratorium	positive (0.73)	negative (0.85)
20.08.	Rumours over CSG exposure	positive (0.87)	negative* (0.00)
25.08.	UBS announces exposure and 0.2 loss	positive (0.84)	positive (0.60)
26.08.	CSG announces Russia woes weigh on profits	negative* (0.01)	positive (0.67)
27.08.	27 % depreciation of rouble	negative* (0.00)	positive (0.54)
31.08.	Duma rejects Chernomyrdin	negative (0.13)	negative (0.66)
09.09.	CSG details exposure	positive (0.15)	negative* (0.00)
10.09.	Yeltsin nominates Primakov	negative* (0.04)	negative (0.31)
17.09.	Talks between banks and Russia on TB	positive (0.13)	negative* (0.00)
20.11.	Principle agreement between Russia and banks	positive (0.71)	positive* (0.05)
10.12.	Banks reject debt restructuring	positive (0.36)	negative* (0.04)

Notes: In parentheses: p-values derived from a t-Student test based on White's coefficient covariance matrix. * significant at the 5 % level

As a second robustness check, we examined the relationship between bank exposure and their excess returns using contingency tables. The results are presented in table 5c. Using the Pearson χ^2 statistic and the associated p-values, we can reject the hypothesis of independence between bank raw returns and its Russian exposures for 4 out of the 5 events for which the cross section regression analysis indicated a significant relationship between the two variables.

Table 5c: Non parametric measures of the relation between bank exposure and excess returns

Date	Event	Contingency coefficient	Pearson χ^2	p-value
11.08.	TB interest rates up by 74 %	0.281	1.4	0.849
17.08.	Moratorium, governments abandons rouble floor	0.184	0.6	0.906
20.08.	Rumours over CSG exposure	0.707	16.0	0.003*
25.08.	UBS announces net exposure and 0.2 loss	0.301	1.6	0.661
26.08.	CSG says Russia woes weigh on profits	0.301	1.6	0.451
27.08.	Worst depreciation of rouble	0.295	1.5	0.677
31.08.	Duma rejects Chernomyrdin	0.354	2.3	0.515
09.09.	CSG details exposure and provisions	0.586	8.4	0.039*
10.09.	Yeltsin nominates Primakov	0.326	1.9	0.592
17.09.	Talks between banks and Russia on TB	0.581	8.2	0.043*
20.11.	Principle agreement between Russia and banks	0.354	2.3	0.131
10.12.	Banks reject debt restructuring	0.581	8.2	0.043*

Note: * significant at the 0.05 level.

The right-hand side of table 5a presents the cross section estimates of the bank category model. The coefficient of the big bank dummy is negative and significant for four events, and positive and significant for the announcement of the principle agreement. The coefficient of the cantonal bank dummy is never significant. The coefficient of the foreign and investment bank dummy is significant and negative for three events, and positive and significant for one event. These results confirm the strong differentiation in market reaction based on the bank category. The comparison of adjusted R-squared of the two models indicates that the bank category model has a higher explanatory power than the exposure model, as already observed in the raw return analysis.

Overall, the results of the regression analysis provide evidence for the individual exposure hypothesis as well as for the contagion hypothesis. The higher explanatory power of the bank category model compared to the exposure model also provides evidence for the intra-category contagion hypothesis.

6. CONCLUSIONS

In this paper, we have studied the impact of the Russian crisis on Swiss banks' stock prices. In a first step, using stock event analysis, we have tried to determine the events related to the Russian moratorium that coincided with significant returns on Swiss banks' shares. Our results indicate that Swiss banks' stocks have been negatively affected by the tensions in the Russian Treasury Bills and the rouble markets, but that they did not react to the Russian debt moratorium itself. Here, a possible interpretation is that the moratorium was not a surprise for investors, given the adverse financial and economic context.

In a second step, we have regressed individual banks' stock returns on their Russian exposure to determine whether the Russian moratorium lead to a general loss of confidence in Swiss banks (contagion hypothesis) or whether investors successfully discriminated between banks according to their exposure to Russia (individual exposure hypothesis). On that issue, our evidence is mixed. For some events, we find a significant and negative relationship between banks' stock returns and their exposure to Russia. For other events, we observe negative and significant returns for all banks, regardless of their Russian exposure. This mixed evidence indicates that investors, even if they partially discriminated between banks according to their Russian exposure, did not exclude a contagion between Swiss banks significantly exposed to Russia and their counterparties in the domestic banking sector. The higher explanatory power of the bank category model compared to the exposure model also indicates that in the absence of publicly available information on Swiss banks' exposure to Russia, investors essentially discriminated among banks based on their belonging to a given category (domestically-focused versus internationally-focused).

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SUMMARY

We try to detect contagion effects within the Swiss banking sector by examining the impact of the Russian debt moratorium on Swiss banks' stock prices. In a first step, using event study methodology, we compute Swiss banks' stock returns for a number of events related to the Russian moratorium. In a second step, using regression analysis, we examine whether the stock returns of individual banks reflected their exposure to Russia (individual exposure hypothesis) or whether they exhibited systemic characteristics (contagion hypothesis). Our event study indicates that events related to the Russian moratorium – but not the moratorium itself – had a significant impact on Swiss banks'

stocks. The results of the regression are compatible with both the contagion and the individual exposure hypotheses.

ZUSAMMENFASSUNG

Indem wir die Auswirkungen des russischen Schuldenmoratoriums auf die Aktienpreise der Schweizer Banken beobachten, versuchen wir Ansteckungseffekte innerhalb des schweizerischen Bankensektors zu identifizieren. In einem ersten Schritt werden mittels einer Ereignisanalyse die Renditen von Schweizer Bankaktien für eine Anzahl von Ereignissen im Zusammenhang mit dem russischen Moratoriums berechnet. In einem zweiten Schritt verwenden wir eine Regressionsanalyse, um zu untersuchen, ob die Aktienrenditen das Engagement der einzelnen Banken in Russland widerspiegeln (Hypothese des individuellen Exposures) oder ob diese systemischen Charakter aufweisen (Ansteckungshypothese). Die Ereignisanalyse lässt darauf schliessen, dass Ereignisse im Zusammenhang mit dem Moratorium – aber nicht das Moratorium selbst – signifikante Auswirkungen auf die Aktien von Schweizer Banken hatten. Die Resultate der Regressionsanalyse sind sowohl mit der Ansteckungshypothese als auch mit der Hypothese des individuellen Exposures vereinbar.

RÉSUMÉ

Nous examinons l'impact du moratoire russe sur la dette sur le prix des actions des banques suisses afin de détecter d'éventuels effets de contagion dans le secteur bancaire. Dans un premier temps, nous utilisons la méthode de l'analyse d'événements afin de calculer le rendement des actions des banques suisses pour un certain nombre d'événements liés au moratoire. Dans un second temps, nous utilisons l'analyse de régression afin d'examiner si l'évolution du prix des actions des banques prises individuellement a reflété l'exposition de ces banques face à la Russie (hypothèse de l'exposition individuelle), ou si elle présentait plutôt des caractéristiques systémiques (hypothèse de la contagion). L'analyse d'événements indique que plusieurs nouvelles liées au moratoire Russe – mais pas le moratoire lui-même – ont eu un impact significatif sur le prix des actions des banques suisses. Les résultats de l'analyse de régression sont compatibles avec l'hypothèse de l'exposition individuelle mais aussi avec l'hypothèse de la contagion.