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A New Cold War? An Empirical Investigation of European Stock Market Effects Following the Crimean Crisis 2014

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Abstract

In early 2014, Crimea became the focus of the worst East-West crisis since the Cold War. In this paper, the market reaction to adverse shocks to Russian-European relations following the Crimean Crisis 2014 is examined. Conducting an event study for 229 European companies operating in Russia, the study illustrates that these companies are hit by an average of -13.5% in cumulative abnormal returns over the entire crisis period. Results establish a clear negative relationship between cumulative abnormal returns and firms' Russia exposure, measured by fraction of sales, assets, as well as a dummy variable reflecting upon the firm's growth aspirations. One exception is the positive impact of a high share of Russian employees – a finding interpreted in light of Russia's communistic history, resulting in increased government reluctance to harm foreign firms providing substantial employment to the local population. By adding industry and geographic variables, the negative impact on abnormal returns proves to be more pronounced for consumer intense industries, low-growth industries, as well as German firms. Finally, linking the exposure measures to valuation theory indicates that these measures have additional explanatory power over changes in future expected cash flows, but not over changes in company riskiness. This thesis and its findings contribute to existing literature on the economic impact of wars and interstate frictions in three different ways: First, our work focuses on firm-level effects and consequently abstains from a GDP or index examination, an analysis more prevailing in literature. Second, by applying firm-level data, the study empirically investigates the relationship between operating exposure to the crisis region and cumulative abnormal returns – an entirely new approach in the European context. Third, our results may also be used by practitioners and other scholars in order to assess potential firm value effects, following future events related to the Crimean Region, a *"ticking time bomb"* with an uncertain outcome.

Keywords: Event study, Stock market performance, External shocks, Abnormal returns, Economy and war, Crimean Crisis, Economic sanctions
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List of Abbreviations

AR	Annual Report
B2B	Business-to-Business
B2C	Business-to-Consumer
BRIC	Brazil, Russia, India, China
CAC	Cotation Assistée en Continu
CAPM	Capital Asset Pricing Model
CAR	Cumulative Abnormal Return
CEE	Central and Eastern Europe
DAX	Deutscher Aktien Index
ETA	Euskadi Ta Askatasuna
EU	European Union
FTSE	Financial Times Stock Exchange
GDP	Gross Domestic Product
ICB	Industry Classification Benchmark
IT	Information Technology
MENA	Middle East and North Africa
MICEX	Moscow Interbank Currency Exchange
MSCI	Morgan Stanley Capital International
N/A	Not Available
OLS	Ordinary Least Squares
PPP	Purchasing Power Parity
S&P 500	Standard and Poor's 500 Stock Index
S&P BMI	Standard and Poor's Broad Market Stock Index
SD	Standard Deviation
SOE	State-Owned Enterprise
U.S.	United States of America
USSR	Union of Soviet Socialist Republics
WACC	Weighted Average Cost of Capital

List of Variables

A. Explanatory Variables	
Operating Exposure Measures	
Fraction_Sales_RU	Fraction of total sales generated in Russia by sample company
Fraction_Assets_RU	Fraction of total assets held in Russia by sample company
Fraction_Employees_RU	Fraction of total employees in Russia of sample company
Growth_Market	Future growth expectations in Russia for sample company
Industry Variables	
Industry_Growth	Growth in sample company's corresponding industry
Consumer_Intensity	Classification of sample company into either B2B or B2C
Geographic Variables	
FX_Development	Currency development of the Ruble relative to sample company's home currency
GDP_Growth	GDP growth for sample company's corresponding home country
Germany	Classification of sample company into either German or non-German based on its headquarter
Control Variables	
Total_Assets	The book value of total assets for sample company on December 31, 2013
Leverage	The ratio of net debt to total capital for sample company on December 31, 2013
Tobin´s Q	Total capital over book value of assets for sample company on December 31, 2013
B. Response Variables	
CARs	Cumulative Abnormal Returns denoting the sum of the company's abnormal returns
Δ*Expected_CF*	Changes in Analysts' cash flow forecasts for sample company
Δ*Beta*	Changes in Betas for sample company

1. Introduction

This section commences with an outline of the study's context, followed by a discussion of its purpose and the underlying research question. Additionally, the section provides an overview of our main findings and closes with a brief description of the paper's structure.

1.1 Context of the Study

Since its independence of the USSR in 1991, Ukraine has been considered a highly divided country: While the western part primarily speaks Ukrainian, the eastern part speaks Russian. The East-West division of the country is in fact not only limited to the language, but goes far beyond: The West clearly intents closer ties to the European Union, the East is striving for better relationships with Russia. These differences caused many intrastate tensions and ultimately led to the Orange Revolution[1] in 2004 (BBC, 2014a).

A decade later, the conflict in Ukraine escalated once again which not only caused the independence declaration of the Crimean region, but one of the worst global East-West crises since the Cold War. The Russian support of the pro-Russian separatists resulted in serious consequences impacting the relationships between the Western World[2] and Russia, ultimately causing the declaration of economic sanctions. Some politicians go as far as to characterize these political tensions as an era of a "*New Cold War*". Former U.S. Secretary of State Henry Kissinger regards the increased tensions between Russia and the Western World as a "*danger of another Cold War*" (Russian Times, 2014). Legvold (2014, p. 74) argues further that "*whatever the outcome of the crisis in Ukraine [will be], Russia's relations with the United States and Europe won't return to business as usual, as they did after the 2008 Russian-Georgian war*[3]."

Many scholars analyze costs and the impact of armed and unarmed conflicts on the economy. Although the overall burden may vary depending on the war and the analysis conducted, most of the researchers agree on the devastating consequences of interstate frictions[4] and wars.

[1] In 2004, the East-West conflict escalated when the pro-European protests (in West Ukraine) over the victory of pro-Russian candidate Yanukovych caused a revote of elections on December 26, 2004, after the initial elections were claimed to be characterized with electoral fraud. During the revote the pro-EU candidate Yushchenko was declared to be the official winner

[2] The term *"Western World"* primarily refers to the countries in the EU and the U.S. However, other countries (e.g., Norway or Japan) which disapprove Russia's support of the Pro-Russian independence forces in Ukraine should be also captured through the term. Hence, the term "Western World" consists of countries disapproving Russia's support of the Pro-Russian forces

[3] The Russian-Georgian war was an armed conflict in 2008 between Georgia and Russia taking place in the Transcaucasia region

[4] Interstate frictions are unarmed political tensions between countries

1.2 Purpose of the Study

As many costs of political conflicts and wars are incurred in the aftermath, quantifying these on a macroeconomic / GDP impact level (as many researchers do) for the Crimean Crisis is difficult at the current stage (e.g., Leach, 2003; Gordon and O'Hanlon, 2002). However, the global stock market reactions have revealed that the economic impact of the Crimean Crisis is by far not limited to Ukraine and Russia: Not only did the Russian MICEX Index incur intraday losses of -10.7%, but also the German DAX (-3.4%), the U.S. Dow Jones (-2.4%), or the British FTSE (-1.5%) (Wearden, 2014). Hence, for the purpose of our thesis, the relationship between European stock market effects following the Crimean Crisis 2014 and European firms' operating exposure in Russia is empirically investigated. Accordingly, the following research question is formulated and examined within our work:

"How can European Stock Market Effects Following the Crimean Crisis 2014 be Linked to Firms' Operating Exposure in Russia?"

Following the research question, the occurrence of cumulative abnormal returns is quantified first. Given these, the main purpose of our study remains in developing a diverse set of operating exposure measures, among others the share of sales[5] in Russia, and linking these to cumulative abnormal returns. Our firm-level focus enables us to explore the microeconomic impact of interstate frictions, contrary to the vast majority of researchers that applies a more macroeconomic focus in their respective studies. Hence, the mechanisms of how operating exposure measures in Russia may impact overall firm value are outlined within this study.

Further, our work provides a solid basis for the assessment of potential future firm value effects, considering that the Crimean Crisis is still not finally resolved, and consequently may be highly relevant for practitioners and researches. Moreover, for the purpose of our paper, companies from Europe, a region where the biggest effect is expected, given its proximity to Russia and potential *"spill-over"*[6] effects, are examined (Schneider and Troeger, 2006).

In sum, to our knowledge, our work is among the first to examine such firm-level effects, following interstate frictions and wars in a European context and thereby complements the analysis of Fisman et al. (2013) who conduct a study in a similar setting

[5] The other operating exposure measures are share of assets, share of employees, and a variable reflecting upon firms' growth aspiration to the Russian market

[6] Schneider and Troeger (2006) prove that countries close to a conflict are affected more than others. Given Europe's proximity to Russia, these so-called *spill-over* effects are expected to be more pronounced in Europe

examining Sino-Japanese adverse shocks. The authors conclude: "*As far as we know, this is the first paper to attempt to examine the channels through which firms are affected […]. While we focus on China and Japan, our approach may clearly be generalized […]. This would also give us a much broader set of institutional circumstance […].*" (Fisman et al., 2013, p. 35). This quote underlines the need for further research in this particular area and confirms the relevance of our research design.

1.3 Operationalization and Results

Hence, in order to achieve the aim of our thesis, European stock market effects following the Crimean Crisis are analyzed by conducting a detailed firm-level analysis in an event methodology setting. Companies are distinguished by a diverse set of operating exposure measure, as well as additional industry and geographic characteristics. For the 1,808 constituents included in the S&P Europe Broad Market Index, geographic breakdown data for Russia is collected from annual reports, corporate press releases and the Orbis database (2014). As the geographic segment reporting differs on a company level and certain industries were excluded (see more details in Section 7), the final sample consists of 229 companies.

As a starting point of our firm-level analysis, cumulative abnormal returns are calculated over the entire crisis[7] which amount to an average of -13.5% for sample firms. Although longer event windows can increase the possibility of confounding events reducing the significance of abnormal returns (MacKinlay, 1997), they are a necessary means to capture the entire crisis effects. This argument is further strengthened by Fisman et al. (2013) who analyze multiple crisis-related events in a single event window over a two-month period. However, to demonstrate the substantial negative effects following the announcement of economic sanctions, or the shooting of flight MH17, *CARs* are additionally measured for four event windows ranging from three to 17 trading days. Further testing[8] confirms their significance.

Following the confirmation of significant negative *CARs* over the full Crimean Crisis period, an OLS regression is performed to test the explanatory power of operating exposure measures on the response variable *CARs*. Operating exposure measures are defined as the share of sales in Russia (henceforth: *Fraction_Sales_RU),* the share of assets in Russia (henceforth: *Fraction_Assets_RU),* the share of employees in Russia *(*henceforth: *Fraction_Employees_RU),* and a dummy variable derived from a content analysis of the annual reports (consistent with Bowman, 1984) reflecting upon the company's self-assessment whether Russia is regarded as a key future growth market (henceforth: *Growth_Market).*

[7] Starting with the disappearance of former Ukrainian president Yanukovych and ending with the truce of Minsk (February 14, 2014 to September 5, 2014)
[8] Tested through Student's t-Test (see Section 6.4)

Furthermore, several control variables are added to the regression model. Consequently, significant negative relationships between *CARs* and *Fraction_Sales_RU, Fraction_Assets_RU,* and *Growth_Market* are established which is intuitive and confirms the results of Fisman et al. (2013) for the Sino-Japanese case – countries more exposed to Russia exhibit more negative *CARs*. However, our findings also reveal that *Fraction_Employees_RU* has a significant positive impact on *CARs,* implying more positive *CARs* over the crisis period for companies with a high share of employees in Russia. Consistent with Fisman et al. (2013), these results can be interpreted upon Russian government reluctance to harm companies employing many workers in Russia, a former communist country with heavy government involvement in the economy.

In a third step, additional industry variables are adopted, comprising industry growth (henceforth: *Industry_Growth*) and consumer intensity, a dummy variable classifying all companies as either B2B or B2C[9] (henceforth: *Consumer_Intensity)*. In essence, both industry variables have a significant impact on *CARs*. While a significant positive relation exists for *CARs* and *Industry_Growth,* implying higher *CARs* for high-growth industries, the *Consumer_Intensity* variable infers that consumer intense firms exhibit significantly lower *CARs*. A possible explanation for the latter finding may be increased consumer sentiment, a very common effect following increased political tensions between countries as shown by many studies (see for example Gupta and Yu, 2009; Prieger et al., 2010). Introducing additional geographic variables for GDP growth (henceforth: *GDP_Growth)*, the foreign exchange development of the Russian Ruble to the firm's home currency (henceforth: *FX_Development*), and a dummy variable for German firms (henceforth: *Germany*) illustrates, that *Germany* is the only significant variable, denoting a negative coefficient. These results are interpreted in light of Germany's (and especially Chancellor Angela Merkel's) leading role in resolving the conflict, as well as Germany's close ties to the Russian economy[10] (see Appendix Table 19 for Russia's most important trade partners). Finally, the robustness of our operating exposure measures is confirmed when introducing the additional geographic and industry variables.

Eventually, operating exposure measures are linked to fundamental valuation theory which defines the value of a firm as its discounted future cash flows (Koller et al., 2010). The explanatory power of our four operating exposure measures *Fraction_Sales_RU, Fraction_Assets_RU, Fraction_Employees_RU,* and *Growth_Market* over the response variables change in future expected cash flows (henceforth: Δ*Expected_CF)* and change in company riskiness (henceforth: Δ*Beta*) is tested. Δ*Expected_CF* is approximated by the change in

[9] Classification is derived from a content analysis of annual reports: Companies primarily selling to businesses are classified as B2B, whereas companies selling primarily to the end-consumers are classified as B2C

[10] Please note that these additional effects captured through the close ties of the German economy to the Russian economy stems from factors other than those captured in the operating exposure measures

consensus cash flow forecasts over the entire crisis period. Although Δ*Beta* is only an approximation for the change in company riskiness, research suggests difficulties to determine the *"right"* WACC for a given company (e.g., Bancel, 2013). Our results indicate that *Fraction_Sales_RU* is the only operating exposure measure with explanatory power over Δ*Expected_CF*. This finding suggests that equity research analysts primarily base their forecasts on earnings figures (as stated by Previts and Bricker, 1994) and therefore put only small emphasis on other variables. Furthermore, none of the operating exposure measures has significant explanatory power over Δ*Beta*. Hence, their irrelevance for Δ*Beta* suggests that investors may perceive them as factors affecting idiosyncratic risk, but not systematic risk and hence the beta (Wei and Zhang, 2006). However, our results do not infer that systematic risk is unchanged. They only suggest that the chosen operating exposure measures lack explanatory power over Δ*Beta*. Instead, as observed by Brounen and Derwall (2010) in the case of the September 11 terrorist attacks, wars and terrorism may cause long-term shifts in systematic risk – a potential scenario for the Crimean Crisis. Considering that the Crimean Crisis has still not been resolved, difficulties remain in the assessment of these long-term shifts.

1.4 Structure of Thesis

The paper at hand consists of five main parts: background information on the Crimean Crisis and previous research related to wars and interstate frictions, hypotheses development, outline of methodology (including definition of explanatory variables) and data selection, and finally results discussion and concluding remarks.

The first part discusses the political dimension of the Crimean Crisis and how it evolved from a civil war to an international crisis. Using this information, literature related to intrastate and interstate conflicts is introduced. The literature review is not only limited to armed conflicts but further discusses literature related to unarmed conflicts between nations, so-called interstate frictions, as it is the case in the Crimean Crisis between Russia and the Western World.

The second part focuses on the hypotheses development. By reference to previous research, four main hypotheses are outlined which are related to *CARs,* and the explanatory power of the chosen operating exposure measures, and industry and geographic variables over *CARs*, Δ*Expected_CF,* and Δ*Beta.*

In the third part, operating exposure measures, and industry and geographic variables are defined, accompanied by their underlying reasoning. Accordingly, the study proceeds to a detailed explanation of our methodology, consisting of the event study approach and OLS regressions. Finally, the data derivation for 229 companies is discussed in more detail.

The last part of our thesis discusses the results and how these are interpreted with reference to existing literature. Our research contribution, certain limitations of our study design, as well as potential further research directions are provided on a concluding remark.

2. The Crimean Crisis

In this section, key developments are presented that finally led to the Crimean Crisis, one of the severest East-West tensions post-Fall of the Iron Curtain, 1990. The Crimean Crisis started out as an intrastate conflict with eastern Ukraine striving for independence and closer ties to Russia. The conflict escalated to an international conflict with Russia supporting pro-Russian separatist forces and the Western World backing pro-European forces, causing heavy tumults on European stock markets (see Table 1).

The Republic of Crimea, officially part of Ukraine, lies on a peninsula stretching out from Southern Ukraine between the Black Sea and the Sea of Azov. Separated from Russia to the east by the narrow Kerch Strait, Ukraine became independent from the USSR in 1991 after a successful nationwide referendum with 90% voting for independence. In early 2014, Crimea became the focus of the worst East-West crisis since the Cold War, when Ukraine's pro-Moscow president Viktor Yanukovych was deprived of his power by violent protests causing more than 88 deaths in Kiev. Subsequently, a new pro-European interim president was put in place and several actions discriminating the Russian-speaking minority were taken (primarily living in Eastern Ukraine) including, among others, a ban of Russian as an official second language. These actions caused a substantial wave of anger in eastern Ukraine, where the majority supports former president Yanukovych and his pro-Russian politics (BBC, 2014a; The Economist, 2014).

Figure 1 – Crimea's Geographic Location (BBC, 2014b)

The conflict escalated on February 27, 2014, when pro-Russian armed men in unmarked uniforms took control over airports and regional government buildings in the Crimean region. Meanwhile, Russia's President Vladimir Putin ordered unscheduled military drills on the Russian-Ukrainian border and Russia's Black Sea military base on the Crimean peninsula[11]. Furthermore, Russia passed several legislations to absorb Crimea into its own territory and to use military forces to *"protect Russian interest"* (BBC, 2014a). On March 16, 2014, Crimea passed a referendum with 97% acceptance voting for the inclusion into the Russian territory which caused severe military operations in the following weeks. Subsequently, several attempts by the international community to de-escalate the hostilities failed. On May 11, 2014 pro-Russian separatists declared independence in the regions of Luhansk and Donetsk after passing referendums not accepted by the Western World. The

[11] Under the 1997 bilateral treaty, Russia pays $98 million p.a. for the use of Ukrainian naval facilities in Crimea for their Black Sea Fleet

conflict exacerbated on July 17, 2014, when Malaysian Airlines flight MH17 was shot down unexpectedly in a territory held by the pro-Russian separatists which caused the death of 298 passengers. Ever since, the pro-Russian separatists, as well as the Ukrainian government have been recriminating each other for being responsible for the terrorist attack on 298 innocent civilians (BBCa, 2014; The Economist, 2014).

With the announcement of sanctions by the Western World against Russia on July 30, 2014 and the Russian response few days later on August 7, 2014 to ban all food imports from the Western World (see Appendix Table 18 for more detailed information on the sanctions), both economies were not only indirectly, but also directly affected through the crisis. Finally, on September 5, 2014 the Ukraine and the pro-Russian forces agreed on a ceasefire (Minsk Protocol) bringing some stability and peace to the region. However, the more recent developments such as the elections held in Luhansk and Donetsk by the separatists on November 2-3, 2014, caused new political tensions making the situation in the Crimean Region still a ticking *"time bomb"* with an uncertain outcome (Klussmann and Schepp, 2014). Overall, according to Ivan Simonovic, the U.N. Assistant Secretary General for Human Rights, the overall Crimean Crisis caused close to 3,000 deaths[12] making it one of Europe's severest crisis in the 21st century (BBCa, 2014; The Economist, 2014).

[12] As per September 2014

Table 1 – Impact of Crimean Crisis on Major European Indices

The Impact of Individual Events on Three Major European Stock Markets

Crisis Events	*DAX30*	*CAC40*	*FTSE100*
Clashes erupt during protests in Kiev, with reasons unclear: 18 dead (18/2/14)	**0.03%**	**-0.10%**	**0.90%**
Kiev sees its worst day of violence for almost 70 years. At least 88 people are killed in 48 hours. (20/2/14)	**-0.43%**	**0.33%**	**0.24%**
President Yanukovych signs compromise deal with opposition leaders (21/2/14)	**0.40%**	**0.59%**	**0.37%**
President Yanukovych disappears. Protesters take control of presidential administration buildings (22/2/14)	**0.54%**	**0.87%**	**0.41%**
Ukraine names ministers for new government. Angry Russia puts 150,000 troops on high alert (26/2/14)	**-0.39%**	**-0.40%**	**-0.46%**
Pro-Russian gunmen seize key buildings in the Crimean capital, Simferopol. Unidentified gunmen appear outside Crimea's main airports (28/2/14)	**1.08%**	**0.27%**	**-0.01%**
Russia's parliament approves President Vladimir Putin's request to use force in Ukraine to protect Russian interests (1/3/14)	**-3.44%**	**-2.66%**	**-1.49%**
The EU and US impose travel bans and asset freezes on several officials from Russia and Ukraine over the Crimea referendum (17/3/14)	**1.37%**	**1.32%**	**0.62%**
President Putin signs a bill to absorb Crimea into the Russian Federation (18/3/14)	**0.67%**	**0.97%**	**0.56%**
US President Barack Obama urges Moscow to "move back its troops" and lower tensions (28/3/14)	**1.44%**	**0.74%**	**0.41%**
Ukraine's acting President, Turchynov, announces the start of an "*anti-terrorist operation*" against pro-Russian separatists (15/4/14)	**-1.77%**	**-0.89%**	**-0.64%**
Russia, Ukraine, the US and the EU say they have agreed on steps to "*de-escalate*" the crisis in eastern Ukraine (17/4/14)	**0.99%**	**0.59%**	**0.62%**
Ukraine's acting president orders the relaunch of military operations against pro-Russian militants in the east (22/4/14)	**2.02%**	**1.18%**	**0.85%**
Pro-Russian separatists in Donetsk and Luhansk declare independence after unrecognised referendums (11/5/14)	**1.26%**	**0.37%**	**0.55%**
Ukraine elects Petro Poroshenko as president in an election not held in much of the east (25/5/14)	**0.00%**	**-0.09%**	**0.08%**
Pro-Russia separatists shoot down a military plane in the east, killing 49 people (14/6/14)	**-0.29%**	**-0.73%**	**-0.34%**
Russia's parliament cancels a parliamentary resolution authorising the use of Russian forces in Ukraine (25/6/14)	**-0.71%**	**-1.28%**	**-0.79%**
The EU signs a landmark association agreement with Ukraine (27/6/14)	**0.10%**	**-0.06%**	**0.34%**
Mr. Poroshenko proposes ceasefire talks with pro-Russian rebels (5/7/14)	**-1.03%**	**-1.41%**	**-0.62%**
Malaysia Airlines flight MH17 from Amsterdam is shot down near the in rebel-held territory, with the loss of 298 lives (17/7/14)	**-1.07%**	**-1.21%**	**-0.68%**
The EU and US announce new sanctions against Russia (30/7/14)	**-0.62%**	**-1.22%**	**-0.50%**
Russian Federation hits West with food import ban in sanctions row (7/8/14)	**-1.00%**	**-1.36%**	**-0.58%**
Ukraine says 700 of its men have been taken prisoner as pro-Russian rebels advance in the east (1/9/14)	**0.09%**	**-0.03%**	**0.08%**
Ukraine and pro-Russian rebels sign a truce in Minsk (5/9/14)	**0.23%**	**-0.19%**	**-0.33%**

Sources: BBC (2014a); Datastream (2014)

Description: The table outlines the impact of major announcements during the Crimean Crisis on three European Stock Markets: The German DAX30, the French CAC40 and the UK FTSE100. Under the column "Crisis Events" each individual event is briefly described with the date of occurence in brackets e.g., (18/2/14) for the clashes during protests in Kiev on February 18, 2014. In the same row as the event, the corresponding stock market reaction on the three outlined national indices is stated for this day. For the first event, the CAC40 reacted by -0.10%, the DAX by +0.03% and the FTSE100 by 0.90%. This logic is then repeated until the very last event of the truce of minsk on September, 5 2014.

3. Literature Overview

This section summarizes the main literature related to our research area. First, literature to characteristics and economic effects of armed conflicts within a country (intrastate) and subsequently, armed conflicts between countries (interstate) is discussed. The section closes with a literature review linked to unarmed conflicts, so-called interstate frictions. The main objective is to shed light on researchers' findings about macroeconomic and stock market effects following these conflicts. To be explicit, it is not the aim of this section to discuss literature[13] *on causes and determinants of wars and conflicts. A selected overview of prior research on major wars and interstate frictions and their economic impact can be found in Table 2.*

3.1 The Economic Effects of Armed Intrastate Conflicts

Intrastate conflicts are often associated with a civil war, a *"type of war"* which according to Sollenberg and Wallensteen (2000) has always existed. The proportion of countries in a civil conflict peaked in the 1990s to more than 20% of all countries worldwide, making it a widely spread conflict form (Blattman and Miguel, 2010).

Several definitions exist in literature with regards to civil wars which primarily differ in the level of violence, or more concretely the number of inhabitants killed (Gleditsch et al., 2002; Fearon and Laitin, 2003; Gersovitz and Kriger, 2013). One of the most commonly used definitions is derived from Singer and Small (1994) who define a civil war as an internal conflict involving at least two parties: a government and a rebel organization. In addtion, at least 1,000 fight-related deaths have to be incurred. To distinguish civil wars from genocides, government troops have to incur at least 5% of the total fatalities in civil wars, implying that several conflicts in Africa are instead considered genocides (Collier et al., 2009).

The majority of researchers argues that civil wars cause a tremendous negative shock on the economy because of destruction and reduced investment (see for example: World Bank, 2003). Galvin (2003) states that additional war-related expenditures (e.g., into the defense sector or for the reconstruction post-war) have high opportunity costs crowding out other more urgent investment such as investments in the education sector. Isham et al. (1996) confirm those negative effects, but argue that civil wars are less destructive and costly than international conflicts, as they involve much less technology. According to Collier (1999) agents shift their assets[14] out of the country in intrastate conflicts, a behavior less prevailing in international wars and making civil wars more severe. He highlights that skilled labor forces are amongst the first to emigrate which impacts the economy severely. Miall (1992) argues that civil wars are much more emotionally intense than international wars, as they split the own

[13] See for example Collier and Hoeffler, 2004; Hegre et al., 2001; Humphreys, 2003; de Soysa, 2002

[14] Within the context of his study "*assets*" should not only be understood as physical assets but also as human capital (skilled labor force)

nation apart. Furthermore, civil wars tend to weaken the legal environment, highly important for the nation's business activities, while international conflicts reinforce public institutions (Tilly, 1975; Blattman and Miguel, 2010).

Several researchers devote their work to quantifying the economic consequences of civil wars, primarily looking at the GDP[15]. Collier (1999) provides one of the most comprehensive studies by analyzing all civil wars (as defined by Singer and Small, 1994) from 1960 to 1992 and concluding that the GDP per capita decreased annually by -2.2% relative to its benchmark[16] due to lower production, asset shifts, and capital destruction. Looking at Africa, a continent with a proportionally high number of civil wars, Collier and Gunning (1999) conclude that only 61% of African-owned capital and assets are located in Africa, while 39% are located outside the continent. Bruck's study (2006) reveals that during Mozambique's civil war in the 1980s, the cattle stock was shifted abroad and thereby decreased by more than 80%. Additionally, Kapuscinski (1988) gives examples from capital goods movement during the Angolan civil war.

Even more striking is the study by De Melo et al. (1996) who examine the growth pattern of the CEE transition economies, and former USSR countries. Using one additional dummy variable *"regional tension"* for countries affected by civil wars (Croatia, Macedonia, Armenia, Georgia, Azerbaijan, Tajikistan), the authors illustrate that these intrastate conflicts lowered GDP by a total of 9% over 1989-1994. Looking at Asia, Ganegodage and Rambaldi (2014) analyze the effects of the civil war in Sri Lanka (1983-2008) between the government and the militant group "*Liberation Tigers of Tamil Eelam*" which lasted for 25 years and caused more than 70,000 deaths and the displacement of 5% of Sri Lanka's population (Kuhn, 2009). Ganegodage's and Rambaldi's findings suggest a severe impact on Sri Lanka's economy, decreasing its GDP even annually by 9%.

Abadie and Gardeazabbal (2003) not only quantify the effects of intrastate conflicts on a macroeconomic / GDP level but also on a microeconomic / company level by looking at the conflict in the Basque region, also known as the Spain – ETA conflict[17]. In the beginning of the 1970s, the Basque region was Spain's third richest region, but has fallen down to number six in the late 1990s after three decades of terrorism and intrastate conflict. By

[15] See for example Collier et al., 2009; Fritzgerald et al., 2001 employing an accounting framework similar to a P&L statement (showing decreased taxation income and additional costs incurred through destructed infrastructure), or Stewart et al., 2001; Abadie and Gardeazabal, 2003 comparing the affected country's GDP to a benchmark

[16] Without a war

[17] Within the purpose of our paper the Spain – ETA conflict is considered as an intrastate conflict, instead of including a separate chapter related to the literature of terrorist attacks

constructing a synthetic[18] control region with similar economic characteristics, the authors illustrate that the intrastate conflict in the Basque region lowered GDP by 10% compared to the control region. When looking at individual firms, publicly listed companies with significant operations in the Basque region[19] outperformed *non-Basque stocks* substantially during the ceasefire in 1998-1999. However, with the end of the ceasefire, the *Basque stocks* showed a negative performance compared to *non-Basque stocks*. Furthermore, using an event study approach, the authors show that during 22 trading days in 1998/1999 with positive news about a peaceful end of the conflict in the Basque region, the *Basque stocks* exhibited positive CARs of +10.1%, whereas on the 66 trading days in 1998/1999 with bad news, Basque stocks exhibited CARs of -11.2%.

Finally, several studies claim that negative effects of civil wars are by far not limited to the home country. According to Murdoch and Sandler (2002), intrastate conflicts can cause severe negative economic effects on neighbor countries, too. The authors quantify these negative "*spill-over*" effects in the sense that countries surrounded by three civil wars encounter the same negative economic effects as they would do, if such a civil war raged within their own borders. Guidolin and La Ferrara (2007) assess the relationship between the Angolan civil war and global diamond mining companies holding concessions in Angola. Using an event study methodology, the authors show that global mining firms exposed to Angola exhibited negative CARs of -4% following the sudden and unexpected death of the rebels' leader Jonas Savimbi on February 22, 2002 which caused the immediate end of the civil war. This result may be counterintuitive, but according to the authors, Angola-exposed firms benefited from a civil war in Angola, as the instability created barriers to entry, lowered the bargaining power of the government, and fostered the non-transparent licensing agreement processes. Their work demonstrates that pure intrastate conflicts can impact firms located abroad (due to their international business activities). Hence, our thesis aims to quantify these effects by looking at companies from Europe and their stock price reactions following the Crimean Crisis, a region where they engage in business.

3.2 The Economic Effects of Armed Interstate Conflicts

Following the definition of the Geneva Conventions of 1949, an interstate armed conflict is defined as a "*declared war or of any other armed conflict which may arise between two or more of the High*

[18] The term "*synthetic"* refers to a *"fictive"* benchmark with similar economic characteristics prior to the outbreak of the conflict
[19] Henceforth *"Basque stocks"*

Contracting Parties[20]*, even if the state of war is not recognized by one of them"* (International Committee of the Red Cross, 2008, p. 1).

Similar to civil wars, international wars cause capital destruction and thereby substantial costs on the overall economy (Blomberg and Hess, 2012). However, Benoit (1973, 1978) states that wars may also lead to economic growth [21] outweighing the negative destructive aspects: The additional military expenditure can serve as expansionary fiscal policy and thereby stimulate the economy. Compared to civil wars, Bilmes and Stiglitz (2008) argue that the technical progress within the last decades make international wars even more costly and destructive as much more technology is involved (Isham et al. 1996). However, according to Sollenberg and Wallensteen (2000) since the end of the Cold War, international wars occur less frequently, making civil wars the predominant type of conflict. One explanation may be that increasing globalization and international trade levels serve as a peace-promoting technology according to Martin et al. (2008) who study international conflicts, and trade levels and conclude that bilateral trade reduces the likelihood of an armed war.

When quantifying direct stock market effects following armed interstate conflicts, there may only be insignificant price movements on the day of war declaration (Cutler et al., 1989). However, according to Leigh et al. (2009) these small reactions on the war declaration day are due to market anticipation prior to the actual announcement[22]. Looking at the Russo-Japanese war from 1904-1905, one of the first wars of the 20th century, Obstfeld and Rogoff (1996) highlight that the outbreak, as well as key events during the war, caused only limited reactions on the global stock markets, as the outburst and Japanese victory were expected by the market participants well in advance.

By regressing stock prices to the intensity of political tensions prior to the start of World War I, Holsti and North (1966) highlight that increased hostilities (prior to the war) among European countries caused the great financial crisis in July 1914. Frey and Kucher (2000) analyze bond price movements of five European countries trading at the Swiss stock exchange between 1928 and 1948. They illustrate that important events during World War II were followed by clear bond price reactions. Bond prices for all five countries (including Germany) reacted in particular to the official start and fell sharply. Furthermore, Frey and

[20] High Contracting Parties are defined as states
[21] His work is in accordance with Keynes (1971) and his economic theory arguing that increased government spending can lead to growth
[22] These expectation biases require the determination of accurate pre-event windows which is discussed in more detail in the methodology section, Section 6

Kucher show that in accordance with the semi-strong form of market efficiency[23] (Fama, 1970), several events expected by the market participants prior to the actual occurrence (e.g., Germany's capitulation) were not followed by strong bond price movements. In the U.S., the most important events during World War II caused a major movement on the Dow Jones Index and led to an increase of overall volatility as observed by Choudhry (2010). However, he points out that major European war events (such as the invasion of France and the battle of Britain) prior to the U.S.' participation in the war in Europe, did not cause any major stock market reactions in the U.S.

Mastroianni et al. (2011) analyze 12 different key events during the Vietnam War (1955-1975) and the stock price reaction of 63-69 global listed defense companies[24]. Using an event study methodology, the authors conclude, that in total, their sample of defense companies reacts negatively to peace-related events, while positive CARs exist when war-related hostile events occur. These findings are confirmed by a variety of other researchers such as McDonald and Kendall (1994) who look into capital markets reactions of American defense companies following 17 unexpected political events involving military actions. Furthermore, the authors prove that the strongest effects occurred during events in the Cold War involving the USSR.

Leigh et al. (2009) examine a future called "*Saddam Securities*" which were traded on an online betting website and depended 100% on the survival of Saddam Hussein pre-declaration of the Iraq war[25]. They conclude that a 10% price increase of the future and hence 10% increase in war probability, decreased the S&P 500 by -1.5%. Furthermore, oil prices moved to the opposite direction, rising by +3% to +4% with a corresponding 10% increase in war probability. These findings suggest that the Iraq War and fall of Saddam Hussein lowered U.S. equity valuations by 15% and increased oil prices by $10 per barrel[26]. In addition, the authors distinguish different industries and find a more pronounced effect for the consumer goods, IT, and airlines sector, but a more positive effect for shares from the gold and energy industry. Finally, Leigh et al. note that stocks from countries heavily dependent on imported oil were affected more negatively than others.

[23] Market efficiency implies stock prices reflect all available relevant information to the market participants. In the weak-form of efficiency, prices incorporate historical information only. In the semi-strong form all publicly available information (also future expectations) are incorporated, while the strong from of efficiency incorporates all publicly and privately available information (Fama, 1970)

[24] The sample varies between 63-69 companies depending on which of the 12 events the authors analyze

[25] The future was traded at the Irish online betting site *"Tradesports"* which pays $10 per share if Saddam Hussein is dismissed at a certain date. Hence, a price of $6 implies a 60% probability of war

[26] As 10% war probability lowers the S&P 500 by 1.5%, 100% war probability lowers the S&P 500 by 1.5% * 10 = 15%; the same calculations are conducted for the oil price

Benos and Jochec (2013) analyze different wars such as the World War II, Korea War, and Vietnam War and their impact on the U.S. stock market. The authors show that stocks containing the words *"America(n)"* or *"USA"* outperformed other stocks by CARs of +6%[27] on average, over the entire war period, when the U.S. engaged in wars perceived positively in the American society. Alternatively, the negatively perceived war in Vietnam is lacking that pattern. They conclude that these positively perceived wars arouse *"investors' patriotic feelings and cause them to gradually and perhaps subconsciously gravitate toward stocks whose name has a patriotic flavor"* (Benos and Jochec, 2013, p. 1)

Schneider and Troeger (2006) study stock market reactions of France's CAC Index, U.S.' Dow Jones Index, and UK's FTSE Index following the First Gulf War in 1991, the war in ex-Yugoslavia, and the Israel-Palestinian conflict. Looking at the First Gulf War, the authors illustrate that stock prices decreased after Iraq's attack against Kuwait, but recovered quickly when the U.S. and its allies entered into the war and started their "*Operation Desert Storm*"[28]. According to their explanation, market participants may expect a "*quick end*" of wars and therefore react positively to the actual start which is also in line with the observations of Brune et al. (2012)[29]. Additionally, Schneider and Troeger demonstrate that stock exchanges in proximity to the conflict region are affected more negatively than others, as investors fear a potential spill-over of the conflict. Hence, the authors support our research design to limit our study to European companies, the geographic region where the biggest effect[30] is expected.

The September 11 terrorist attacks remain the only terrorist attack[31] with long-term effects on financial markets and non-diversifiable market risk (or systematic risk) (Brounen and Derwall, 2010). After the second airplane crashed into the World Trade Center, trading floors closed for three days. When markets reopened, a loss on the Dow Jones of more than 7% was noted. Overall, 3,000 people died and the U.S. stock market lost around one trillion U.S. Dollars, or 10% of America's GDP. Examining specific industries suggests that airline stocks were most affected, as many investors were worried about potential bankruptcies for these companies. The September 11 terrorist attacks caused a long-term increase in overall

[27] This study does not suggest that CARs are positive following these wars; it just implies that these U.S. stocks outperformed stocks lacking these words by CARs of 6%

[28] The "Operation Desert Storm" followed Iraq's invasion and annexation of Kuwait and consisted of a war by forces from 34 nations led by the U.S. against Iraq

[29] Brune et al. (2012) look at different wars in the 20th and 21st century and show that stocks decrease prior to wars (market pricing in probabilities) but react positively on the war announcement day hoping for a *"quick end"*

[30] Please see Section 7 for a more detailed reasoning why our study is limited to European firms only

[31] Within the purpose of our study the September 11 attacks are considered as an interstate conflict instead of having a separate chapter on literature about terrorist attacks (see more in: Eldor and Melnick, 2004; Karolyi and Martell, 2006; Chen and Siems 2004). Our reasoning is that these terrorist attacks caused a wave of international wars as a consequence (e.g., Afghanistan War, Iraq War, War against Terrorism, Somalia)

market risk and thereby increased betas for all industries (Drakos, 2004; Carter and Simkins, 2004).

To conclude, wars may cause tremendous reactions on stock markets, although the effects differ depending on the industry and country. However, as the declaration of a war is often expected in advance, market participants price in their expectations about a potential escalation of the conflict well beforehand. This finding will be important at a later stage when defining the event window length (in Section 6) to capture potential anticipation effects of the Crimean Crisis.

3.3 The Economic Effects of Unarmed Interstate Frictions

According to Davis and Meunier (2011) interstate frictions and political tensions are unarmed conflicts that worsen the international relations between two or more states and thereby severely impact trade. Keshk et al. (2004) describe the relationship between trade and interstate frictions as *"political relations are driving commerce, not the other way around"* (Keshk et al., 2004, p. 1175). Martin et al. (2008) characterize the period after World War II as a time where *"world trade increased rapidly, while the number of conflicts decreased (although the risk of a global conflict was obviously high)"* (Martin et al., 2008, p. 866). As the Crimean Crisis did not result in any direct military action of the Western World against Russia, but instead caused increased political tensions between these two sides, the following section will touch upon literature related to such unarmed forms of conflicts.

Another study (Prieger et al., 2010) examines the French-Chinese relationship prior to the Olympic Games in Beijing 2008, a period of increased tensions between these two countries due to former president Sarkozy's decision to meet with the Dalai Lama and the disruption of the Olympic torch relay in Paris due to French protests against China. Following these events, a strong consumer sentiment against French products in China caused French car manufacturers' Chinese sales to decline by around -25%. Gupta and Yu (2009) confirm previous studies by illustrating that political relations clearly influence the investment and trade flows between the U.S. and the rest of the word. Their analyses claim that the war in Iraq increased political tensions between the U.S. and several European countries, leading to decreased economic flows because of increased consumer sentiment in Europe against the U.S.

Fisman et al. (2013) devote their work to the analysis of increased political relations between Japan and China – two countries with a high degree of economic dependency on the one hand, but a high degree of animosity due to past wars, on the other. As discussed in the introduction, the authors provide a comprehensive event study assessing two events, the

"*Textbook event*"[32] and the "*Senkaku event*"[33], which caused adverse shocks to Sino-Japanese relations. In contrary to the literature presented in the previous sections, the authors conduct their assessment with firm-level data, thereby abstaining from a macroeconomic or stock index examination. By defining different exposure measures[34], the scholars conduct a differentiated analysis to measure the negative impact of interstate frictions on both Japanese and Chinese companies. By calculating CARs over the event period and conducting a regression analysis to test the explanatory power of different exposure measures, Fisman et al. (2013) prove a significant negative relationship between exposure measures and CARs, implying a more negative stock market reaction for highly exposed firms following these two events. By introducing additional industry variables, the authors demonstrate that Japanese businesses in more consumer and SOE intense industries[35] exhibit significantly lower CARs due to increased consumer sentiment and government retaliation. As shown, due to the similarities between our and the authors' research design, the paper by Fisman et al. (2013) serves as the main reference point throughout our study.

These examples illustrate that interstate frictions may result in consumer sentiments which can highly impact the firms' performance. Hence, it confirms our research design to include additional variables distinguishing between B2B and B2C, as well as German and non-German companies. This may enable us to grasp potential consumer boycotts towards German products, considering the country's and Chancellor Angela Merkel's leading role in supporting the pro-European forces in Ukraine.

[32] The textbook event on April 5, 2005 describes the event where the Japanese government authorized the use of a history schoolbook which (according to the Chinese criticism) whitewashed the crimes committed by the Japanese during World War II on the Chinese population

[33] The Senkaku event on September 7, 2010 describes the event where a Chinese fishing trawler collided with two Japanese marine ships in disputed waters close to the Senkaku Island which led to the custody of the Chinese captain by the Japanese marine

[34] The exposure measures include share of sales, share of assets, and share of employees in the respective non-home country (e.g., Japanese shares for Chinese companies)

[35] This variable only applies to the analysis of Japanese firms operating in China,as SOEs do not exists in Japan

Table 2 – Overview of Literature on Economic Effects of Selected Wars and Interstate Frictions

Selected Literature related to specific wars and interstate frictions

Authors	Type of Conflict	Name of Conflict	Variable	Core Findings
Abadie and Gardeazzabbal (2003)	Intrastate Conflict	Spain - ETA conflict (1959-2011)	GDP, CARs	GDP lowered by 10% compared to control region. CARs of +10.1% during 22 trading days with good news, -11.2% CARs during 66 trading days with bad news
Benos and Jochec (2009)	Interstate Conflict	World War II (1939-1945), Korea War (1950-1953), Vietnam War (1955-1975)	CARs	Positive CARs for stocks containing the words "USA" or "America(n)" following positively perceived wars, but not when negatively perceived war (Vietnam)
Brounen and Derwall (2010)	Interstate Conflict	September 11 Terrorist Attack (2001)	Betas	Long-term shifts in market risks, increasing betas
Bruck (2006)	Intrastate Conflict	Civil War in Mozambique (1977-1992)	Cattle Stock	Cattle stock shifted abroad and reduced by 80% in total over time
Choudhry (2010)	Interstate Conflict	World War II (1939-1945)	Index return	Major movement of the Dow Jones Index following major European war events but only after the U.S. entered the European war
Collier (1999)	Intrastate Conflict	Civil Wars from 1960-1992	GDP	GDP per capital decreased annually by -2.2% relative to ist benchmark due to lower production, asset shifts, and capital destruction
De Melo et al. (1996)	Intrastate Conflict	Civil Wars in Croatia, Macedonia, Armenia, Georgia, Azerbaijan, Tajikistan	GDP	GDP in CEE transition (and former USSR) economies lowered by 9% due to the conflict
Fisman et al. (2013)	Interstate Frictions	China-Japan frictions	CARs	Companies more exposed to China / Japan experienced more negative CARs following the Textbook and Senkaku events
Frey and Kutcher (2000)	Interstate Conflict	World War II (1939-1945)	European bonds	Bond prices for 5 sample companies reacted heavily to World War II events. Expected events caused only limited reaction
Ganegodage and Rambaldi (2014)	Intrastate Conflict	Civil War in Sri Lanka (1983-2008)	GDP	GDP lowered by 9% p.a.
Guidolin and La Ferrara (2007)	Intrastate Conflict	Civil War in Angolan (1975-2002)	CARs	Negative CARs of -4% for global mining firms exposed to Angola (holding concessions). Destabilization of Angola made mining more profitable for firms
Leigh et al. (2009)	Interstate Conflict	Iraq War (2003-2011)	Index return, oil price	Using "Saddam Securities", S&P500 reaction to Iraq War estimated at -15% and oil price increase to +30%-40%. However, gradual decrease / increase over time as market expected war
Mastroianni et al. (2011)	Interstate Conflict	Vietnam War (1955-1975)	CARs	Positive reaction (CARs) of 63-69 defense companies
Obstfeld and Rogoff (1996)	Interstate Conflict	Russo-Japanese War (1904-1905)	Index return	Limited reaction as market participants expected war and outcome
Prieger et al. (2010)	Interstate Frictions	China-France frictions	Automotive sales	-25% sales for French automotive brands following increased political tensions prior to the Olympic games in Beijing 2008

Sources: See Authors

Description: The table provides a detailed summary for the literature examined, elaborating on intrastate conflicts, interstate conflicts, and interstate frictions. The column "Authors" reveals who conducted the study at hand. "Type of Conflict" classifies whether it is a interstate conflict, intrastate conflict, or interstate frictions."Name of Conflict" names the exact war / friction. "Variable" shows what kind of economic variable the authors examined. And "Core Findings" summarizes their findings

4. Development of Hypotheses

This section outlines the four main hypotheses that are tested throughout the course of the paper. These are formulated based on previous research and aim to analyze the existence of CARs over the Crimean Crisis, as well as the explanatory power of operating exposure measures, and industry and geographic variables over CARs. Finally, operating exposure measures are linked to fundamental valuation theories by examining their explanatory power over the change in expected future cash flows and change in company riskiness. Figure 6 in the Appendix summarizes all different hypotheses in form of a flow chart to present their logical sequence of these.

4.1 Hypothesis I – Cumulative Abnormal Returns

Previous research has found significant abnormal returns in armed and unarmed conflicts as described in the literature review with CARs being either positive (e.g., defense industry), or negative, depending on the industry and event analyzed. Abadie and Gardeazabbal (2003) illustrate that during 22 trading days with positive news about the development in the Basque region, stocks highly exposed to the region exhibited positive CARs of +10.1%, whereas during 66 days with negative news, stocks reacted with CARs of -11.2%. Fisman et al. (2013) support these findings by studying the "*Textbook Event*" which caused CARs of -5.8% for Japanese firms operating in China and -3.8% for Chinese firms operating in Japan. Furthermore, European stock markets such as the German DAX or the British FTSE have incurred intraday losses of -3.4% or -1.5% respectively, following key crisis events (Wearden, 2014). A more comprehensive overview is provided in Table 1 which illustrates key events during the Crimean Crisis and intraday returns for the CAC 40, DAX 30, FTSE 100. To test whether these patterns have caused abnormal returns, Hypothesis 1 (*H1*) is formulated as following:

H1: *CARs for our sample of 229 European firms are* ***negative*** *and* ***statistically significant*** *during the entire Crimean Crisis and selected major crisis events.*[36]

4.2 Hypothesis II – Operating Exposure Measures

Fisman et al. (2013) analyze the impact of Sino-Japanese tensions by gathering firm-level data of several operating variables for both Chinese and Japanese companies. The authors analyze whether these variables explain CARs during their event window by conducting an OLS regression. To our knowledge, besides Fisman et al., no other scholars assess the impact of wars and / or political tensions on a firm-level using a diverse set of operating exposure measures and other firm characteristics. The authors confirm this observation by pointing out

[36] These selected major events are defined in the methodology, Section 6

that *"our detailed data on companies' foreign exposure facilitates a better identification of the impact of interstate frictions on firm value [than other studies]"* (Fisman et al., 2013, p. 7). Furthermore, they conclude that *"while we focus in this paper on China and Japan, our approach may clearly be generalized to a broader set of country pairs to develop more deeply our understanding of how cross-country relations affect economic relationships"* (Fisman et al., 2013, p. 35). This being said, our work aims to test the significance of the operating exposure measures *Fraction_Sales_RU*, *Fraction_Assets_RU,* and *Fraction_Employees_RU* for European firms in Russia[37], upon the confirmation of *H1* (see Figure 6 in Appendix for the logical sequence of hypotheses). Furthermore, as Russia is regarded as a high growth market, one additional dummy variable, *Growth_Market,* is included in our analysis, reflecting the future Russian growth expectations of sample firms (see Section 7 for more details). In accordance with the results of Fisman et al., negative relationships between *CARs* and *Fraction_Sales_RU*, *Fraction_Assets_RU*, and *Growth_Market* (e.g., the higher the fraction of sales in Russia the more negative is the CAR), and a positive relationship for *Fraction_Employees_RU* (the higher the fraction of employees in Russia the more positive is the CAR) are expected. The negative coefficients are more intuitive as many industries experience heavy sales declines (Ostroukh, 2014) and are threatened with asset freezes by President Puntin (Holehouse, 2014), a result of the Crimean Crisis. Furthermore, Russia's communistic past suggests strong government involvement in the economy, resulting in potential reluctance to harm foreign firms providing substantial employment to the local population. Hence, our Hypotheses 2a-2c (*H2a-H2c*) under the confirmation of significant *CARs* (*H1*) are formulated as:

H2a: *Firms with a higher Russian sales and asset exposure exhibit higher* ***negative*** *cumulative abnormal returns over the full crisis.*

H2b: *Firms with a higher share of employees in Russia exhibit higher* ***positive*** *cumulative abnormal returns over the full crisis.*

H2c: *Firms with higher future growth expectations in the Russian market exhibit higher* ***negative*** *cumulative abnormal returns over the full crisis.*

4.3 Hypothesis III – Industry and Geographic Variables

To expand our analysis, additional industry variables are introduced, consistent with Fisman et al. (2013) who include the industry variables *SOE intensity*[38], *food vs. non-food*[39]*,* and *consumer*

[37] Please refer to Section 7 for the reasoning to focus on European firms only and to abstain from a two-sided analysis and study the impact of the Crimean Crisis on Russian firms
[38] Classifying each industry depending on the share of SOE firms

intensity[40]. Although not all industry variables are adopted for the purpose of our study, impact of consumer sentiment following the Crimean Crisis is studied, leading to the inclusion of the variable *Consumer_Intensity*. Consumer sentiment following wars and political tensions between countries is a widely discussed topic in research with mixed results, as described in the literature review (see for example Hwang 2011, Ashenfelter et al. 2007). Furthermore, the variable *Industry_Growth* as our second industry variable is included, leading to the formulation of Hypothesis 3a (*H3a)*:

H3a: Industry variables have a ***significant impact*** *on cumulative abnormal returns during the full crisis.*

Moreover, three geographic variables are introduced. In contrast to Fisman et al. (2013), who study Japanese / Chinese firms only, our work aims to examine the effects of the Crimean Crisis on multiple European firms. Considering that the entire EU announced sanctions against Russia, it is expected that all European countries are affected to a similar degree by the Crimean Crisis. Furthermore, non-EU countries such as Switzerland have followed the EU by imposing similar sanctions (Maclucas, 2014). However, as countries such as Germany heavily depend on foreign exports, geographic variables which are based on the headquarter country are deemed less relevant (Bryant, 2013). Accordingly, Hypothesis 3b (*H3b*) is formulated as:

H3b: *Geographic variables have* ***no significant impact*** *on cumulative abnormal returns during the full crisis.*

Furthermore, to validate the findings from *H2a-H2c*, Hypothesis 3c (*H3c)* is formulated:

H3c: *Results from H2a-c are* ***robust*** *when adding additional industry and geographic variables.*

Please refer to Table 3 below for the overview of explanatory variables and their expected significance and sign for hypotheses *H2a-H2c* and *H3a-H3b.*

[39] Distinguishing firms by food vs. non-food, an industry heavily regulated by the Japanese / Chinese authorities (dummy variable)

[40] Firms are classified whether they engage primarily in the B2B sector (selling to businesses), or B2C sector (selling to the end-consumer)

Table 3 – Expected Signs of Explanatory Variables for CARs

Overview of Main Hypotheses and Expected Signs (I)

Dependent Varriable - Cumulative Abnormal Returns (CARs)

Explanatory Variables	Hypothesis	Expected Significance	Expected Sign
Fraction_Sales_RU	H2a	Yes	(-)
Fraction_Assets_RU	H2a	Yes	(-)
Fraction_Employees_RU	H2b	Yes	(+)
Growth_Market	H2c	Yes	(-)
Consumer_Intensity	H3a	Yes	(-)
Industry_Growth	H3a	Yes	(+)
GDP_Growth	H3b	No	N/A
FX_Development	H3b	No	N/A
Germany	H3b	No	N/A

Notes: Fraction_Sales_RU is the ratio of sales in Russia to total sales for the sample of European firms; Fraction_Assets_RU is the ratio of assets in Russia to total assets; Fraction_Employees_RU is the ratio of employees in Russia to total employees; Growth_Market is a dummy variable denoting 1 if Russia is recognized as a growth market in a firm's annual report and 0 if it is not a target market; Germany is a country dummy taking the value 1 if a firm is headquartered in Germany and 0 if a firm is headquartered in any other country; FX_Development refers to a company's corresponding currency development (e.g., RUB/EUR) during the Crisis - The Ruble development with regards to the company's home currency (e.g., RUB/EUR of - 3%) implies that RUB depreciates by - 3% making EU products in Russia more expensive; Industry_Growth and GDP_Growth refer to growth within a company´s corresponding industry and country.

Description: The Table shows the expected significance and signs of selected explanatory variables on the response variable of Cumulative Abnormal Returns. In the second column "Hypothesis" each explanatory variable is matched with a corresponding hypothesis as outlined in Section 4. The column "Expected Sign" refers to the explanatory variable's coefficient's sign (+ or -). Example: For the explanatory variable "Fraction_Sales_RU", the corresponding hypothesis is H2a, its coefficient is expected to be significant and negative within regression models. This implies that a significant negative relationship between Fraction_Sales_RU and Cumulative Abnormal Returns exists. For the explanatory variables where no signficance is expected (as marked with "no"), no statement on expected signs of coefficient was made and this is therefore marked with a "N/A" in the "Expected Sign" column.

4.4 Hypothesis IV – Operating Exposure Measures and Valuation Theory

Upon confirmation of *H1*, *H2a-H2c*, and *H3c* (see once again Figure 6 in Appendix for the sequence of hypotheses), the operating exposure measures are linked to fundamental valuation theory which defines the value of a company as its discounted future cash flows (Koller et al., 2010). Hence, the explanatory power of the chosen operating exposure measures over the change in expected future cash flows (Δ*Expected_CF)* and firm riskiness, approximated through the change in beta[41](Δ*Beta),* is examined.

According to the Capital Asset Pricing Model (CAPM) of Sharpe (1964) and Lintner (1965), a company's risk is expressed through its systematic risk (the beta) and its company-specific risk (idiosyncratic risk). However, under the CAPM assumption, investors diversify and thus only take systematic risk into account, when evaluating firm riskiness. Systematic risk changes over time and can be influenced through wars and other major world events. For instance, many researchers illustrate the severe impact of the September 11 terrorist attacks on

[41] See Section 6.6 for our underlying assumptions

long-term financial markets by increasing overall systematic market risk (e.g., Brounen and Derwall, 2010). Al Refai (2011) shows that the Iraq War caused an increase in country betas for four out of 11 countries in the MENA region. Hence, the Crimean Crisis may have increased the overall systematic risk and hence firm betas. However, as it is not the objective to assess whether firm riskiness has changed during the crisis, the focus of the study remains on an evaluation of the explanatory power of operating exposure measures over Δ*Beta*.

Harvey and Siddique (2004) for example, define idiosyncratic risks among others as firm size, operating leverage and inventory growth. Gaspar and Massa (2004) define that increased competition increases idiosyncratic risk. Wei and Zhang (2006) even state that changes in company fundamentals (e.g., changes in corporate earnings) cause only differences in idiosyncratic risks. Hence, following Wei and Zhang (2006) our operating exposure measures would have only explanatory power over changes in idiosyncratic risk, but not over the change in beta, the change in systematic risk, which leads to formulation of Hypothesis 4a (*H4a*):

H4a: *Operating exposure measures have* ***no significant impact*** *on the change in company riskiness (approximated through beta change) during the full crisis.*

Furthermore, Fisman et al. (2013), conduct not only an event study of the *Textbook event*, but also examine the long-term effects on future profits using sales exposure as an explanatory variable. The authors show that the fraction of sales in China has a significant negative impact on long-run profits for 2005-2008 (following the textbook event) for Japanese firms. Hence, consistent to Fisman et al. our final Hypothesis 4b (*H4b*) is formulated as:

H4b: *Operating exposure measures have a* ***significant impact*** *on the change in expected future cash flows (approximated through changes in consensus cash flow forecasts) during the full crisis.*

Please refer to Table 4 for the overview of explanatory variables and their expected significance and sign for hypotheses *H4a* and *H4b*.

Table 4 – Expected Signs of Explanatory Variables for Valuation Drivers

Overview of Main Hypotheses and Expected Signs (II)

Explanatory Variables	Hypothesis	Expected Significance	Expected Sign
Dependent Varriable - ΔBeta_(Full)			
Fraction_Sales_RU	H4a	No	N/A
Fraction_Assets_RU	H4a	No	N/A
Fraction_Employees_RU	H4a	No	N/A
Growth_Market	H4a	No	N/A
Dependent Varriable - ΔExpected_CF_(Full)			
Fraction_Sales_RU	H4b	Yes	(-)
Fraction_Assets_RU	H4b	Yes	(-)
Fraction_Employees_RU	H4b	Yes	(+)
Growth_Market	H4b	Yes	(-)

Notes: Fraction_Sales_RU is the ratio of sales in Russia to total sales for the sample of European firms; Fraction_Assets_RU is the ratio of assets in Russia to total assets; Fraction_Employees_RU is the ratio of employees in Russia to total employees; Growth_Market is a dummy variable denoting 1 if Russia is recognized as a growth market in a firm's annual report and 0 if it is not a target market; ΔBeta_(Full) refers to firms' changes in betas over the Full Crisis Period; ΔExpected_CF_(Full) refers to changes in analyst forecasts of firms' future cash flows over the Full Crisis Period.

Description: The Table shows the expected significance and signs of selected explanatory variables (e.g. Fraction_Sales_RU) on the dependent variables of Change in Firm "Betas" and Change in "Cash Flow Forecasts" respectively. In the second column "Hypothesis" each explanatory variable is matched with a corresponding hypothesis as outlined in Section 4. The column "Expected Sign" refers to the explanatory variable's coefficient's sign (+ or -). Example: For the explanatory variable "Fraction_Sales_RU", the corresponding hypotheses are H4a for Change in firm Betas and H4b for Change in Cash Flow Forecast. Its coefficient is expected to be significant and negative within regression models for Cash Flows and insignificant for Beta. This implies that a significant negative relationship between Fraction_Sales_RU and Change in Cash Flows exists. For the explanatory variables where no signficance is expected (as marked with "no"), no statement on expected signs of coefficient was made and this is therefore marked with a "N/A" in the "Expected Sign" column.

5. Explanatory Variables for Regression Analyses

This section summarizes the different explanatory variables, operating exposure measures, industry, and geographic variables, which are all used throughout our regression analyses. Finally, different explanatory variables that have been disregarded are briefly outlined and discussed. Please refer to Table 5 for a comprehensive summary of all our explanatory variables[42].

5.1 Operating Exposure Measures

Fraction of Russian Sales

To measure the current Russian exposure, the share of sales in Russia disclosed in the most recent annual report prior to the outbreak of the Crimean Crisis[43] in February 2014, is set as one of our operating exposure measures. Considering that firms usually do not disclose any geographic segment data for more cash-flow approximating earnings figures (e.g., EBITDA), the first operating exposure measure is defined as *Fraction_Sales_RU*. The share is calculated to control for the different sizes of our sample companies (see Section 7.2 for more details on sample companies). Hence, *Fraction_Sales_RU* is defined as:

$$Fraction\_Sales\_RU_{it} = \frac{Sales\ in\ Russia_{it}}{Total\ sales\ worldwide_{it}} \quad (1)$$

Where *t* denotes the latest full financial year available prior to February 2014 and *i* the specific firm.

Fraction of Russian Assets

An important factor to consider is the amount of investments made by European companies in Russia. As companies often consider Russia as an emerging market[44] with high expected future growth rates, firms currently may generate relatively low sales (low exposure), but high investment outlays, necessary to stimulate growth. Furthermore, firms may also have production facilities located in Russia through which they are exposed. To account for these exposures the share of total assets in Russia defined through the variable *Fraction_Assets_RU* is measured as*:*

$$Fraction\_Assets\_RU_{it} = \frac{Total\ assets\ in\ Russia_{it}}{Total\ assets\ worldwide_{it}} \quad (2)$$

[42] Please note that the control variables included in our regression are introduced in Section 6.5
[43] Using the financials after February 2014 is avoided as they may be distorted due to the Crimean Crisis
[44] The screening process of annual reports for data gathering of different operating exposure measures (see Section 7 for more details) has revealed that many companies define Russia as part of emerging markets or BRIC

where *t* denotes the latest full financial year available prior to February 2014 and *i* the specific firm.

Fraction of Employees in Russia

The third operating exposure measure is defined as a firm's share of total employees in Russia. As a former communist country, Russia still experiences heavy economic regulation where many enterprises (similar to China's SOEs) are owned (at least partially) by the state[45]. Accordingly, to test *H2b,* a measure to account for Russian government reluctance to harm companies with high employment of Russian workers is designed. Since large companies with many Russian employees in nature, may experience special *"protection"* from the government, the study proceeds with the relative value of employees in Russia, instead of an absolute value, to take into account different firm sizes in our final sample. In addition, different control variables are introduced in Section 6.5 which account, among others, for size. Hence, the third operating exposure measure *Fraction_Employees_RU* is defined as:

$$Fraction\_Employees\_Russia_{it} = \frac{Total\ employees\ in\ Russia_{it}}{Total\ employees\ worldwide_{it}} \quad (3)$$

Where *t* denotes the latest full financial year available prior to February 2014 and *i* the specific firm.

Russia as a Future Growth Market

Finally, as companies currently may have low operating exposure (hence low: *Fraction_Sales_RU, Fraction_Assets_RU,* and *Fraction_Employees_RU*), but high future growth aspirations in the Russian market, the additional variable *Growth_Market* is included. As equity research reports usually abstain from geographic segment forecasts, a content analysis of annual reports is conducted to approximate the future growth aspirations in Russia. The vast literature on content analyses[46] (see for example Krippendorff, 2004) suggests that annual reports can be valuable to conduct textual analyses. In line with Bowman (1984) who conducts a content analysis of annual reports and concludes that "*annual reports can provide valuable clues to competitors' corporate strategy"* (Bowman, 1984, p. 69), company filings are screened. The purpose is to identify whether the keywords *"future growth"* and / or *"strategic future focus"* are used in connection with Russia and the Russian market. Hence, the variable

[45] According to the OECD, the Russian government owns more than 160 joint-stock companies, has controlling stakes in more than 540 firms and a blocking stake in around 1,200 companies. Furthermore, it has smaller stakes in another 1,750 companies. (Filatov et al., 2005)

[46] Content analysis refers to the analysis of texts and can include both qualitative and quantitative approaches. A detailed description and literature review of content analyses is avoided

Growth_Market, a dummy variable taking the value 1 if the company regards the Russian market as a future growth market and 0 otherwise, is introduced.

5.2 Industry Variables

Growth Rate

As our sample is spread across a variety of industries, sample companies[47] are assigned to a specified industry using the Industry Classification Benchmark [48] (ICB) extracted from Thomson Reuters (Datastream, 2014). Next, the industry growth rate is approximated by looking at the return of the corresponding MSCI World **Sector** Index[49] over the crisis event period (please see Figure 7 in Appendix for the industry growth rates of our sample companies):

$$Industry\_Growth_i(\tau_1, \tau_2) = \frac{MSCI\ World\ Sector\ Index_{iI,\tau_2}}{MSCI\ World\ Sector\ Index_{iI,\tau_1}} - 1 \quad (4)$$

where τ_1 denotes the start of the Crimean Crisis, February 14, 2014, and τ_2 denotes the end of the Crimean Crisis, September 5, 2014. *I* refers to the corresponding industry[50] for firm *i*.

Consumer intensity

Many researchers (e.g., Epstein and Schnietz 2002 on the impact of customer boycotts; Teoh, et al., 1999 on the effects of South African consumer boycotts; Ashenfelter et al., 2007 on American consumer reaction for French wine following France's disagreement with the Iraq War) argue that consumer sentiment is highly relevant when assessing the impact of wars and interstate frictions on economies. Hence, companies are classified as either operating in a consumer intense industry (B2C), or in a business intense industry (B2B). For that purpose, annual reports are analyzed for a better understanding of companies' main customer segments (either businesses or end-consumers). Hence, using content analyses the variable *Consumer_Intensity*, a dummy variable taking the value 1 if the company is operating in the B2C segment and 0 otherwise (B2B segment), is introduced.

[47] Please note that according to the ICB two different classifications exist for consumer companies: *consumer goods* and *consumer services*. For the purpose of our study, these two categories are merged to classify companies from the consumer industry as consumer companies

[48] The ICB is an industry classification taxonomy which was launched in 2005 by the Dow Jones and FTSE to assign each stock to one of ten industries

[49] The MSCI World Sector Indeces consist of firms from industries included in the MSCI World Index

[50] Please note that the market return for the consumer industry is the average of the market returns of the MSCI World Consumer Discretionary Index and the MSCI World Consumer Staples Index

5.3 Geographic Variables

German Companies

Considering that Germany accounted for 14% of total Russian imports in 2013 (number one position in Europe, see Table 19 in Appendix for more information on Russia's top 10 trade partners) the variable *Germany*, a dummy variable taking the value 1 if the company is headquartered in Germany and 0 otherwise, is introduced. The variable *Germany* enables the examination of a potential distinct effect on German companies. Furthermore, *Germany* captures only the additional effects stemming from the close ties of the German economy to the Russian one which are not explained by the operating exposure measures[51]. An example for such an effect may relate to German companies' higher dependence on Russian gas. Additionally, considering Germany's and especially Chancellor Merkel's leading role in supporting the pro-European forces in Ukraine, the dummy variable *Germany* allows for additional political interpretation (when significant).

GDP Growth

To capture the impact of different GDP growth rates, inherent in sample companies' 12 home countries, on *CARs*, a GDP growth rate is assigned to each individual sample firm based on its headquarters. GDP growth rates for Q1-Q3 2014 are derived from the OECD (2014)[52] (please see Figure 8 in Appendix summarizing the growth rate for our sample countries). As monthly GDP data is not published, quarterly data was used as an approximation (Q1-Q3) Hence, the variable *GDP_Growth* is defined as:

$$GDP\_Growth_{ic}(Q1-Q3) = GDP\_Growth_{ic}(Q1) + GDP\_Growth_{ic}(Q2) + GDP\_Growth_{ic}(Q3) \quad (5)$$

where *C* denotes the country where firm *i* is headquartered.

Currency Development

To account for the currency development of the Russian Ruble to the companies' home currency (e.g., SEK), the variable *FX_Development* is introduced. Many exporting countries (Sweden) may benefit from their own currency depreciation as products can be offered cheaper in foreign markets (e.g., Russia). However, when the foreign currency (e.g., Russian Ruble for Swedish companies) depreciates, foreign products become more expensive abroad

[51] The fact that German companies have in nature more sales / assets / employees / growth expectations in Russia is already captured in the operating exposure measures

[52] Please note that Q3 GDP data for Finland, Greece, Sweden, Switzerland has not been published yet (as of October 30, 2014), implying that forecast data was used from Trading Economics (2014) for these countries

and therefore less affordable to the local population. This may harm European firms exporting to Russia. Hence, the variable *FX_Development* is included and defined as:

$$FX\_Development_i(\tau_1, \tau_2) = \frac{RUB/Home_{i,\tau_2}}{RUB/Home_{i,\tau_1}} - 1 \quad (6)$$

where τ_1 denotes the Crimean Crisis event start, February 14, 2014, and τ_2 denotes the Crimean Crisis event end, September 5, 2014. *RUB/Home* denotes the currency exchange rate of the currency *Russian Ruble* to the local *home currency* for firm *i* (please refer to Figure 9 in Appendix, summarizing the currency exchange rate development over the Full Event Window).

Table 5 – Detailed Overview of Explanatory Variables

Definition of Explanatory Variables and Ratios

Variable	*Definition*	*Formula*	*Source*
Fraction_Sales_RU	Fraction of total group sales in t generated in Russia for company i	$Fraction\_Sales\_RU_{it} = \frac{Sales\ in\ Russia_{it}}{Total\ sales\ worldwide_{it}}$	AR; ORBIS (2014); Press Releases
Fraction_Assets_RU	Fraction of total group assets in t held in Russia by company i	$Fraction\_Assets\_RU_{it} = \frac{Total\ assets\ in\ Russia_{it}}{Total\ assets\ worldwide_{it}}$	AR; ORBIS (2014); Press Releases
Fraction_Employees_RU	Fraction of total group employees in t in Russia for company i	$Fraction\_Employees\_RU_{it} = \frac{Total\ employees\ in\ Russia_{it}}{Total\ employees\ worldwide_{it}}$	AR; ORBIS (2014); Press Releases
Growth_Market	Future growth expectations in Russia for company i	Dummy variable taking 1 if Russia is considered a key growth market, otherwise 0	AR; Press Releases
Industry_Growth	Growth in company i's corresponding industry over the Crisis Period	$Industry\_Growth_i(\tau_1, \tau_2) = \frac{MSCI\ World\ Sector\ Index_{il,\tau_2}}{MSCI\ World\ Sector\ Index_{il,\tau_1}} - 1$	Datastream (2014)
Consumer_Intensity	Classification of company i into either B2C or B2B based on its main customer segment	Dummy variable taking 1 if firm can be classified as B2C, and 0 if B2B	AR; Orbis (2014); Press Releases
Germany	Classification of company i into either German or non-German firm based on the location of its headquarter	Dummy Variable taking 1 if a firm is headquartered in Germany, and 0 if it is headquartered in any other country	AR; Datastream (2014)
GDP_Growth	GDP Growth for company i's corresponding headquarter country over Q1-Q3 2014	$GDP\_Growth_{iC}(Q1-Q3) = GDP\_Growth_{iC}(Q1) + GDP\_Growth_{iC}(Q2) + GDP\_Growth_{iC}(Q3)$	OECD (2014)
FX_Development	Foreign Currency development of the Ruble relative to company i's home currency over the Crisis Period	$FX\_Development_i(\tau_1, \tau_2) = \frac{RUB/Home_{i,\tau_2}}{RUB/Home_{i,\tau_1}} - 1$	Datastream (2014)
Leverage	The ratio of net debt to total capital for company i on December 31, 2013	$Leverage_{i,13} = \frac{Net\ Debt_{i,13}}{Total\ Capital_{i,13}}$	Datastream (2014)
Total_Assets	The book value of total assets for company i on December 31, 2013	$BV\ Total\ Assets_{i,13}$	Datastream (2014)
Tobin´s Q	Ratio capturing premiums/discounts of company i's stock over its book value of assets on December 31, 2013	$Tobins's\ Q_{i,13} = \frac{Total\ Capital_{i,13}}{BV\ of\ Total\ Assets_{i13}}$	Datastream (2014)

Description: The Table shows the definitions, formulas and sources for each individual explanatory variable used. The "Variable" refers to the name used within regression models. The abbreviations refer to the following items: AR refers to firms' annual reports 2013; Orbis (2014) refers to a comprehensive firm database that provides a detailed breakdown of firms by their subsidiaries; Datastream (2014) refers to Thomson Reuters Datastream, a comprehensive fiancial database where both stock market as well as firm specific data can be extracted. OECD (2014) refers to data retrieved from the Organization for Economic Cooperation and Development.

5.4 Delimitation of Choice of Explanatory Variables

In this subsection, alternative explanatory variables that are not part of our analysis are discussed. These have been disregarded due to data gathering difficulties, or other reasons.

Exposure to Russian Gas

Considering the high dependency of European firms on Russian natural gas, the inclusion of an additional Russian gas exposure measure has been evaluated. Such a variable would have captured the impact of the Crimean Crisis on the energy supply and thereby sample companies. However, as such data is hardly disclosed in annual reports (and other publicly available sources), this idea has been abandoned.

Credit Exposure

Firms, especially from the financial sector, are exposed to Russia in form of loans / bonds they provide to Russian individuals / government / firms. The Crimean Crisis may cause creditors to default on their debt and therefore impact European firms indirectly through their financial ties to Russia. Consequently, a variable reflecting upon sample firms' Russian credit exposure has been considered, but due to difficult data gathering from publicly available sources and its applicability primarily for the financial sector, eliminated.

Food vs. Non-Food

As outlined in Table 18 in the Appendix, the Russian sanctions primarily affect European companies from the food / agricultural sector. Accordingly, our initial idea consisted of including a dummy variable, reflecting firms' business activities in the food industry. However, as statistical significance can not be established for such a variable due to a sample of less than 30[53] from the food industry, the variable was discarded (please refer to Section 7 for a detailed description of our sample by industry).

Other Industry-Specific Exposure Measures

Depending on the industry, certain exposure measures can be highly relevant for one industry but irrelevant for other industries. The analysis of the Angolan civil war on global mining firms (see Literature Review, Section 3.1, Guidolin and La Ferrara, 2007) indicates that the location of the mine is a relevant metric for the operating exposure of mining firms. In the same sense, credit exposure may be more important for the financial industry than other operating exposure measures. However, as our study aims to work with a general set of variables and thereby avoid industry-specific exposure measures, these variables have been disregarded.

[53] A common statistical rule of thumb requires a minimum sample of 30 companies in order to draw significant conclusions

Ukraine Exposure Measures

Considering that the military actions all occur on Ukrainian territory (and not on Russian), the economic effects of firms exposed to Ukraine may be much more severe. However, considering the relatively small size of the Ukrainian economy (see Table 20 in the Appendix) and the difficulties to gather geographic segment data for Ukraine, firms' Ukraine exposure is ignored for the purpose of our analysis.

6. Methodology

In this section, the methodology used within our work is outlined. First, the event study approach is introduced and different event windows defined for the calculation of cumulative abnormal returns. Subsequently, the different regression models for the analyses of the response variables CARs, ΔExpected_CF, and ΔBeta are explained in more depth.

6.1 Event Study Methodology

To test the hypotheses outlined in Section 4, an event study is conducted as defined by MacKinlay[54] (1997). With a clear aim to quantify and further analyze stock price effects following the Crimean Crisis, the focus of this work will rest on a quantitative analysis only and abstain from a qualitative approach. To be specific, it is not the purpose of our study to analyze market efficiency (e.g., are markets efficient and do investors react in the *"right way"* or do they over- / underreact following the Crimean Crisis), but rather to assign a quantitative value to the overall stock price reaction. The main part of this paper is devoted to measuring whether the operating exposure measures, the industry and geographical variables outlined in Section 5 are relevant explanatory dimensions with regards to the magnitude of the stock markets' reactions[55]. Furthermore, our data-driven approach is also aligned with other studies assessing the relationship between conflicts and stock market effects (e.g., Fisman et al., 2013, Mastroianni et al., 2011).

Dolley (1933) is the first researcher to outline the event study methodology which then has broadly been used and adapted by academic scholars across a variety of research fields. For the purpose of our study, the event study approach is tailored to the characteristics of the Crimean Crisis, by commencing with the definition of events and its corresponding event windows[56]. Second, cumulative abnormal returns are calculated over the event window accompanied by significance testing. Third, OLS regressions are performed using the operating exposure measures, and industry and geographic variables from the previous section as explanatory (independent) variables, and the calculated *CARs* as the response (dependent) variable. By further applying our initial operating exposure measures to the two new response variables, Δ*Expected_CF* and Δ*Beta* (as our approximation for firm riskiness), the study further aims to assess whether the chosen variables have explanatory power over these two fundamental valuation drivers (Koller, et al., 2010).

[54] For the purpose of our study the event study methodology of MacKinlay (1997) is taken as given
[55] Upon confirmation of significant negative *CARs* in *H1*(see logical sequence of hypotheses testing, Figure 6, Appendix)
[56] The event window is the period over which the event spans (start to end)

6.2 Event Definition

To differentiate between many aspects and degrees of severities during the Crimean Crisis, five event windows[57], ranging from three to 146 trading days, are designed. In agreement with Fisman et al. (2013), a larger event window enables us to capture the majority of crisis-related events, whereas a shorter event window measures stock market reactions only for a few crisis-related events. However, as longer event windows may increase the possibility of confounding events and consequently reducing the significance of abnormal return results (MacKinlay, 1997), our study analyzes a mix of different event windows[58] over shorter and longer periods. Furthermore, each event window is extended[59] by several days before the start and after the end, to seize both potential announcement anticipation, as well as post-announcement drifts as found by Bartov et al. (1998) and Leigh et al. (1998) in their respective studies.

The event *"Full"* captures the entire Crisis period starting with the disappearance of former president Yanukovych[60] and ending with the Minsk Protocol, the ceasefire between Ukraine and the pro-Russian forces. The event window spans over a period from February 14, 2014 to September 5, 2014. The event *"Intensity"* consists of the intensity period from July 17, 2014 to August 8, 2014, where many crisis-related events such as the announcement of sanctions or the shooting of Malaysian Airlines Flight MH 17 took place. Furthermore, three shorter events *"Terrorists", "MH17"* and *"Sanctions"* are examined, lasting between three to ten trading days. A detailed summary of these five events and the corresponding event windows is provided in Table 6.

[57] The event window is the period over which the return effects are measured. To capture anticipation and prolongation effects the event window consists not only of the day where the event happened (e.g., sanction announcement) but is also extended by several days before and after

[58] Longer (e.g., entire crisis), as well as shorter event windows (e.g., single crisis-related events) are applied to measure *CARs* during different lengths of event windows

[59] One exception is the event *MH17* which fully occurred unexpectedly; hence the event window is not extended by several days prior to the happening

[60] Please note that the actual event where former president Yanukovych disappeared, happened on February 22, 2014, thus 8 days after the start of our event window *"Full"*. However, to capture anticipation effects prior to the disappearance, the event window was chosen as February 14, 2014. This approach is chosen for all other events (except for event *MH 17, Terrorists*)

Table 6 – Detailed Overview of the Five Event Windows

Overview of Event Windows

#	Name	Event	Description	Significant Events	From	To	Event Window Length
1	*Full*	**Total Crisis Window**	Total Crisis starting with the arrest of the first 200 protestors in Kiev and ending with the truce signing between Ukraine and pro-Russian rebels in Minsk.	**2014-02-22** Dissapperance of Ukrainian President Yanukovych **2014-02-27** Pro-Russian gunmen seize key buildings in the Crimean capital, Simferopol. **2014-03-18** President Putin signs a bill to absorb Crimea into the Russian Federation **2014-04-11** Ukraine's acting President, Olexander Turchynov, announces the start of an "*anti-terrorist operation*" against pro-Russian separatists. It quickly stalls **2014-07-1**7 Malaysia Airlines flight MH17 from Amsterdam is shot down near the village of Grabove in rebel-held territory, with the loss of 298 lives **2014-07-30** EU and USA announce hard sanctions against Russia **2014-08-07** Russia hits West with food import ban in sanctions row **2014-09-01** Ukraine says 700 of its men have been taken prisoneros by pro-Russian rebels **2014-09-05** Ukraine and pro-Russian rebels sign a truce in Minsk.	2014-02-14	2014-09-05	***146 trading days***
2	*Intensity*	**Intensity Period**	Event window within the Crimean Crisis focusing on the most intense weeks of the crisis in terms of economic sanctions as well as the war-related tensions	**2014-07-17** Malaysia Airlines flight MH17 from Amsterdam is shot down near the village of Grabove in rebel-held territory, with the loss of 298 lives **2014-07-30** EU and USA announce extensive sanctions against Russia **2014-08-07** Russia hits West with food import ban in sanctions row.	2014-07-17	2014-08-08	***17 trading days***
3	*Terrorists*	**Anti-Terrorist Period**	Ukraine's acting President, Olexander Turchynov, announces the start of an "anti-terrorist operation" against pro-Russian separatists. It quickly stalls.	**2014-04-11** Ukraine's acting President, Olexander Turchynov, announces the start of an "anti-terrorist operation" against pro-Russian separatists	2014-04-11	2014-04-17	***5 trading days***
4	*MH17*	**Maylasian Airlines Shooting**	Malaysia Airlines flight MH17 from Amsterdam is shot down near the village of Grabove in rebel-held territory, with the loss of 298 lives.	**2014-07-1**7 Malaysia Airlines flight MH17 from Amsterdam is shot down near the village of Grabove in rebel-held territory, with the loss of 298 lives	2014-07-17	2014-07-21	***3 trading days****
5	*Sanctions*	**Sanctions Announcements RU/EU**	EU and Russia sanctions announcements following political tensions between Ukraine and Russia	**2014-07-30** EU and USA announce extensive sanctions against Russia **2014-08-07** Russia hits West with food import ban in sanctions row	2014-07-28	2014-08-08	***10 trading days***

* **Study of *MH17*** announcement was conducted without taking any trading days before the announcement into the event period in order to account for the fact that the event was not anticipated by financial markets

Description: The Table outlines the study´s five event windows over which cumulative abnormal returns are measured for the Crimean Crisis. For each event window, the table provides a short name (e.g., "Full") which will be used in regression models and a longer event name and desription. Further an overview of significant events during each event period is provided followed by the time frame over which the respective event spans and the number of trading days this amounts to. For the Total Crisis Window Event, trading days amount to 146 days, for instance. This shall enhance the reader´s understanding of the five key events studied in the following sections.

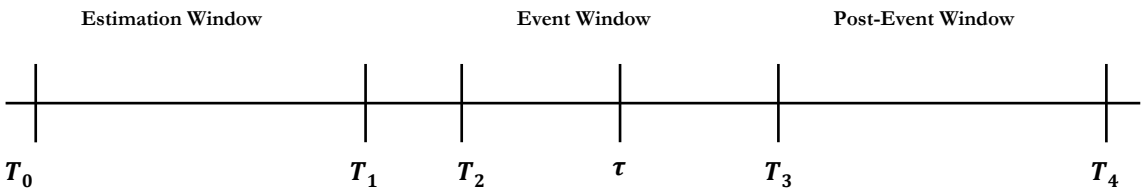
Source: BBC (2014a)

6.3 Calculating Cumulative Abnormal Returns

6.3.1 Estimation of the Market Model

In order to yield the cumulative abnormal returns for the five event windows, as specified in the previous section, a market model is used as defined by MacKinlay (1997) who breaks down the event study into three different windows as shown in Figure 2.

Figure 2 – Overview of Event Study Windows



In the estimation window $L_1 = T_1 - T_0$ the $\propto$, β and ε term for each stock is calculated using an OLS regression with stock returns as the dependent variable and market returns as the independent variable. To avoid potential announcement effects on the parameter estimation, there are 7 trading days between T_1 and T_2.

A firm's expected return is initially estimated by the market model which relates the return of any security to the return of the market. In our study, the market model is defined as:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{7}$$

$$E(\varepsilon_{it} = 0) \qquad Var(\varepsilon_{it}) = \sigma_{\varepsilon_i}^2$$

where R_{it} and R_{mt} are the returns of period[61] t on security i and the market portfolio m respectively, and α_i, β_i and $\sigma_{\varepsilon_i}^2$ are the parameters estimated by the market model (MacKinlay, 1997). α_i denotes the intercept parameter for the firm-specific return unaffected by the market model, β_i denotes the coefficient reflecting upon the sensitivity of the security return to the market return, and ε_{it} reflects an error term. Following MacKinlay's argument that more complex factor models reduce only little of the variance in abnormal returns and that the explanatory power of additional variables is rather small, the study abstains from using other market models such as the Fama-French three factor model.

For the estimation of the market model, an ordinary least squared regression (OLS) over a 100-trading-days estimation window (of length L_1), ending one week prior to the start of the first event window *Full,* is conducted. Assuming that continuing crisis events may bias

[61] Please note that within the context of our study the term *"period"* refers to a trading day

the whole crisis event window, the same L_1 will be used for all event windows[62]. T_{0+1} is the first date, and T_1 the last date of the estimation window and for firm *i* the parameters are estimated using the following formulas:

$$\hat{\beta}_i = \frac{\sum_{\tau=T_0+1}^{T_1}(R_{i\tau} - \hat{\mu}_i)(R_{m\tau} - \hat{\mu}_m)}{\sum_{\tau=T_0+1}^{T_1}(R_{m\tau} - \hat{\mu}_m)^2} \quad (8)$$

$$\hat{\alpha}_i = \hat{\mu}_i - \hat{\beta}_i\hat{\mu}_m \quad (9)$$

$$\hat{\sigma}_{\varepsilon_i}^2 = \frac{1}{L_1 - 2}\sum_{\tau=T_0+1}^{T_1}(R_{i\tau} - \hat{\alpha}_i - \beta_i R_{m\tau})^2 \quad (10)$$

The mean return of the market and the security over the estimation period is calculated as:

$$\hat{\mu}_i = \frac{1}{L_1}\sum_{\tau=T_0+1}^{T_1} R_{i\tau} \quad (11)$$

$$\hat{\mu}_m = \frac{1}{L_1}\sum_{\tau=T_0+1}^{T_1} R_{m\tau} \quad (12)$$

$R_{i\tau}$ is the return for period τ[63] for company *i* and $R_{m\tau}$ is the return for the same period for the MSCI World[64].

6.3.2 Abnormal Returns

Following the definition of the market model, abnormal returns are calculated for our sample. The abnormal return denotes the difference between actual and expected return (according to the market model):

$$\widehat{AR}_{i\tau} = R_{i\tau} - \hat{\alpha}_i - \hat{\beta}_i R_{m\tau} \quad (13)$$

Hence, $\widehat{AR}_{i\tau}$ corresponds to the disturbance term of the market model, namely the term being different from the expected rate of return and the observed return of stock *i*. Following the

[62] Defining a new market model for each of the five events is also possible. However, considering that certain events (e.g., *Intensity*) happen in the middle / at the end of the overall crisis, the market model would have been biased as it would include return movements related to the Crimean Crisis

[63] Within the context of our paper, one period corresponds to one trading day

[64] The MSCI World Index includes large and mid-cap stocks across 23 countries. It consists of 1,615 constituents and the index covers approximately 85% of the free float-adjusted market capitalization in each country

null hypothesis and conditional on the market returns of the event window, abnormal returns will be normally distributed with a zero conditional mean and variance $\sigma^2(\widehat{AR}_{i\tau})$ where:

$$\sigma^2\left(\widehat{AR}_{i\tau}\right) = \sigma_{\varepsilon_i}^2 + \frac{1}{L_1}\left[1 + \frac{(R_{m\tau} - \hat{\mu}_m)^2}{\hat{\sigma}_m^2}\right] \tag{14}$$

The first term $\sigma_{\varepsilon_i}^2$ in the equation denotes the disturbance variance, the second term denotes the sampling error of estimating $\hat{\alpha}_i$ and $\hat{\beta}_i$ in the market model formula (see Formula 7). Having a large L_1 implies that the second term of the parameter sample errors is zero ($\frac{1}{L_1}$ is close to zero). The remaining first term $\sigma_{\varepsilon_i}^2$ is independent over time.

6.3.3 Cumulative Abnormal Returns

To calculate the CAR for security *i* over the event window τ_1 to τ_2, the abnormal return observations over τ_1 to τ_2 are aggregated:

$$\widehat{CAR}_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} (\widehat{AR}_{i\tau}) \tag{15}$$

and the variance of the $\widehat{CAR}_i$ for each event and a large L_1[65]:

$$\sigma^2{}_{\widehat{CAR}_i}(\tau_1, \tau_2) = (\tau_2 - \tau_1 + 1)\sigma_{\varepsilon_i}^2 \tag{16}$$

Finally, the *CARs* across our entire sample *N* are calculated:

$$\overline{CAR}(\tau_1, \tau_2) = \frac{1}{N}\sum_{i=1}^{N} \widehat{CAR}_i(\tau_1, \tau_2) \tag{17}$$

$\overline{CAR}(\tau_1, \tau_2)$ denotes the arithmetic average of *CARs* for the event window across the 229 securities in our sample. Thus, the variance is defined as:

$$\sigma^2{}_{\overline{CAR}}(\tau_1, \tau_2) = \frac{1}{N^2}\sum_{i=1}^{N} \sigma^2{}_{\widehat{CAR}_i}(\tau_1, \tau_2) \tag{18}$$

[65] A large L_1 implies sample errors of the parameters being zero, as discussed

6.4 Significance Testing

Upon aggregation, CARs enable us to draw conclusions whether stocks reacted economically significant to the chosen event. To test whether the CARs calculated are statistically significant, the Student's t-test is applied to our results[66]. Formulating the null hypothesis

$$H_0: \overline{CAR}(\tau_1, \tau_2) = 0 \tag{19}$$

that the average abnormal returns equal zero, our normally distributed test is defined as:

$$J_1 = \frac{\overline{CAR}(\tau_1, \tau_2)}{\sigma(\overline{CAR}(\tau_1 \tau_2))/\sqrt[2]{N}} \sim N(0,1) \tag{20}$$

Consequently, the null hypothesis is rejected only if the absolute value of J_1 exceeds the corresponding t-value of the two-tailed[67] Student's t-distribution with n-1 degrees of freedom and a significance level[68] of $a = 0.05$. If $|J_1| > t - value$ with a probability of 97.5% the CARs of our sample *N* are statistically significant.

6.5 Regression Models to Identify Explanatory Variables of CARs

In an Ordinary Least Squares Regression (OLS) different explanatory variables $X_1, X_2, \dots, X_k$ are used to predict the response variable Y:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_K X_{Ki} + \varepsilon_i \tag{21}$$

so that $\beta_1, \beta_2, \dots, \beta_K$ minimize the sum of the squared residuals (Woolridge, 2008).

For the purpose of our study, the explanatory power for a variety of independent variables[69] is tested[70] over the response variable $\widehat{CAR}_i(\tau_1, \tau_2)$. Considering that the Crimean Crisis constantly evolved over time with different crisis-related events occurring over a 7-month period (lacking one short major event[71]), the response variable $\overline{CAR}(\tau_1, \tau_2)$ is defined over the event window *Full* with $\tau_1 = February\ 14, 2014$ and $\tau_2 = September\ 5, 2014$ for the

[66] Testing for statistical significance is necessary to assess whether *CARs* from our sample are significant enough to draw conclusions over the whole population (all stocks)
[67] The two-tailed test is used as one-tailed tests are usually used when financial or economic theory proposes a relationship of a specific direction (e.g., positive or negative). In our study *CARs* can move in both directions, positive and negative
[68] According to the CFA Institute (2014), the $a = 0.05$ corresponds to *"strong evidence"*, $a = 0.10$ *"some evidence"*, $a = 0.01$ *"very strong evidence"*
[69] Detailed out in Section 5
[70] Namely different operating exposure measures, and industry and geographic variables
[71] An example of an event study consisting of one short major event would be the study by Ferstl et al. (2012) looking at the Fukushima catastrophe 2011 in Japan

purpose of our OLS regression[72]. Several shortcomings of long event windows compared to short event windows exist as discussed in Section 6.2. However, considering the specific characteristics of the Crimean Crisis, lacking one major event, shorter event windows may not capture the full effect of the crisis (Fisman et al., 2013).

To test the explanatory power of our variables, different OLS regressions are run along three different steps. First, the significance of the company specific operating exposure measures is tested and measured:

$$\begin{aligned}\widehat{CAR}_i(Full) = {} & \alpha_i + \beta_1 Fraction\_Sales\_RU_i + \beta_2 Fraction\_Assets\_RU_i \\ & + \beta_3 Fraction\_Employees\_RU_i + \beta_4 Growth\_Market_i + \beta_5 Leverage_{\ i} \\ & + \beta_6 Tobin's\ Q_i + \beta_7 Total\_Assets_i + \varepsilon_i\end{aligned} \tag{22}$$

In accordance with Fisman et al. (2013), three additional control variables[73] that could influence the response variable *CARs* are introduced, in order to isolate the effects of the Crimean Crisis as shown in equation 22. *Leverage* is the ratio of net debt to total capital[74] (enterprise value) and captures differences in liquidity buffers and degrees of firms' indebtedness. *Tobin' s Q* denotes the ratio of total capital (enterprise value) to its total book (asset) value and captures premiums / discounts of a stock over its replacement costs of assets (Tobin, 1969). *Total_Assets* represents the total book value of firms' asset value of a firm and consequently controls for different company sizes[75].

Second, the analysis is expanded by keeping the variables from equation 22 and adding additional industry variables into the regression[76]:

$$\begin{aligned}\widehat{CAR}_i(Full) = {} & \alpha_i + \beta_1 Fraction\_Sales\_RU_i + \beta_2 Fraction\_Assets\_RU_i \\ & + \beta_3 Fraction\_Employees\_RU_i + \beta_4 Growth\_Market_i \\ & + \boldsymbol{\beta_5 Industry\_Growth_i + \beta_6 Consumer\_Intensity_i} + \beta_7 Leverage_i \\ & + \beta_8 Tobin's\ Q_i + \beta_9 Total\_Assets_i + \varepsilon_i\end{aligned} \tag{23}$$

Finally, all variables from equation 23 are kept and additional geographic variables are added to the equation:

[72] But please note that *CARs* are calculated and tested for all event windows defined in Section 6.2
[73] All control variables are extracted from Datastream (2014) and dated December 31, 2013 to capture the pre-Crisis state
[74] Market capitalization plus net debt
[75] This control variable is very important as our operating exposure measures are relative variables (fractions). Hence, controlling for size is crucial to assess whether the government is less reluctant to harm large firms (employing many Russian workers by nature) for example
[76] The additional variables are highlighted in bold

$$\widehat{CAR_i}(Full) = \alpha_i + \beta_1 Fraction\_Sales\_RU_i + \beta_2 Fraction\_Assets\_RU_i + \beta_3 Fraction\_Employees\_RU_i + \beta_4 Growth\_Market_i + \beta_5 Industry\_Growth_i + \beta_6 Consumer\_Intensity_i + \boldsymbol{\beta_7 GDP\_Growth_i} + \boldsymbol{\beta_8 Germany_i} + \boldsymbol{\beta_9 FX\_Development_i} + \beta_{10} Leverage_i + \beta_{11} Tobin's\ Q_i + \beta_{12} Total\_Assets_i + \varepsilon_i \quad (24)$$

Furthermore, it should be noted that all regressions are run by using heteroskedasticity-consistent robust standard errors and each of the three regression equations in this section is subject to different specifications throughout our study: Instead of running only one regression for each step, different variables are included / excluded for each equation to verify robustness of our results when changing model specification.

6.6 Regression Models to Link Operating Exposure Measures to Valuation Theory

Upon confirmation of a significant impact of our operating exposure measure on *CARs* and their robustness, these explanatory variables are linked to fundamental valuation theory. Implying that the stock price equals the present value of future cash flows (Koller et al., 2010), the operating exposure measures *Fraction_Sales_RU, Fraction_Assets_RU, Fraction_Employees_RU,* and *Growth_Market* are tested for their explanatory power over Δ*Expected_CF* and Δ*Beta*. The changes in analysts' cash flow forecasts for the next three years 2015-2018, retrieved from the I/B/E/S database (2014) are deemed a good approximation for Δ*Expected_CF* (a common approximation according to Trueman, 1994) *:*

$$\Delta Expected\_CF_{\ i}(Full) = \frac{CF\_Forecast\_Y1_i(\tau_2)+CF\_Forecast\_Y2_i(\tau_2)+CF\_Forecast\_Y3_i(\tau_2)}{CF\_Forecast\_Y1_i(\tau_1)+CF\_Forecast\_Y2_i(\tau_1)+CF\_Forecast\_Y3_i(\tau_1)} - 1 \quad (25)$$

Furthermore, Betas for each security *i* at τ_1 and τ_2 are calculated by regressing stock returns to the market return (MSCI World) over the last 365 trading days for τ_1 and τ_2 respectively:

$$\hat{\beta}_{\tau_1 i} = \frac{\sum_{\tau=\tau_1-365}^{\tau_1}(R_{i\tau}-\hat{\mu}_i)(R_{m\tau}-\hat{\mu}_m)}{\sum_{\tau=\tau_1-365}^{\tau_1}(R_{m\tau}-\hat{\mu}_m)^2} \quad \text{and} \quad \hat{\beta}_{\tau_2 i} = \frac{\sum_{\tau=\tau_2-365}^{\tau_2}(R_{i\tau}-\hat{\mu}_i)(R_{m\tau}-\hat{\mu}_m)}{\sum_{\tau=\tau_2-365}^{\tau_2}(R_{m\tau}-\hat{\mu}_m)^2} \quad (26)$$

Once calculated, Δ*Beta* is determined over the event window *Full*, as our approximation for the change in firm riskiness:

$$\Delta\ Beta_i(Full) = \frac{\hat{\beta}_{\tau_2 i}}{\hat{\beta}_{\tau_1 i}} - 1 \quad (27)$$

Using Δ*Beta* as an approximation for the change in the discount rate is a rather simplifying assumption. However, considering the difficulties and subjectivity to measure the right discount rate, the WACC, Δ*Beta* is used for the purpose of our study (Bancel, 2013). The assumption is thereby derived:

$$WACC_i = \frac{E_i}{V_i} R_{ie} + \frac{D_i}{V_i} R_{id}(1 - T_{ci}) \tag{28}$$

where E_i is the value of equity, D_i the value of debt, $V_i = E_i + D_i$, R_{id} the cost of debt, T_{ci} the corporate tax rate and R_{ie} the cost of equity all for security i. Assuming that the capital structure is unchanged between τ_1 and τ_2 , as well as T_{ci} and R_{id}, R_{ie} remains the only relevant variable, defined through the Capital Asset Pricing Model (Sharpe, 1964; Lintner, 1965):

$$R_{ie} = R_f + \beta_i (R_m - R_f) \tag{29}$$

where $(R_m - R_f)$ is defined as the equity risk premium, the long-term return of the financial markets in excess of the risk-free rate R_f. As research has no clear standpoint on the market risk premium, it is very hard to measure potential shifts during the Crimean Crisis. To illustrate, Fernandez et al. (2012) conduct a survey with various practitioners and conclude that the market risk premium varied from 5.4% to 15.3%. Neglecting the change in R_f over the event period, β_i remains.

Subsequently, two separate OLS regressions are run to test the explanatory power of the operating exposure measures over the response variable Δ*Expected_CF:*

$$\begin{aligned} \Delta\, Expected\_CF_i(Full) &= \alpha_i + \beta_1 Fraction\_Sales\_RU_i + \beta_2 Fraction\_Assets\_RU_i \\ &+ \beta_3 Fraction\_Employees\_RU_i + \beta_4 Growth\_Market_i + \beta_5 Leverage_{\ i} \\ &+ \beta_6 Tobin's\ Q_i + \beta_7 Total\_Assets_i + \varepsilon_i \end{aligned} \tag{30}$$

and $\Delta\, Beta_i(Full)$:

$$\begin{aligned} \Delta\, Beta_i(Full) = \alpha_i &+ \beta_1 Fraction\_Sales\_RU_i + \beta_2 Fraction\_Assets\_RU_i \\ &+ \beta_3 Fraction\_Employees\_RU_i + \beta_4 Growth\_Market_i + \beta_5 Leverage_{\ i} \\ &+ \beta_6 Tobin's\ Q_i + \beta_7 Total\_Assets_i + \varepsilon_i \end{aligned} \tag{31}$$

Once again, all regressions are run by using heteroskedasticity-consistent robust standard errors and are subject to different specifications throughout our study.

7. Data

This section outlines the data gathering approach related to the chosen operating exposure measures. Upon extensive interaction with other scholars during the writing process, the data gathering approaches of Fisman et al. (2013) and Chaney (2014) are outlined, who similarly required geographic segment data on firm-level. Furthermore, a thorough discussion of the study's derivation of the final sample set of 229 companies is conducted. Finally, potential issues with regards to the data gathering process are critically evaluated.

7.1 Geographic Segment Data for Operating Exposure Measures

For the purpose of our study, some of the variables[77] are derived from common data sources (e.g., Datastream, 2014), while the operating exposure measures required extensive manual data gathering. Hence, for a better understanding of how scholars gather geographic segment data on a firm-level, existing literature is examined as an initial starting point of the data collection process.

Fisman et al. (2013) obtain geographic segment data from the Japanese Ministry of Finance[78] and the Chinese Customs Authorities[79]. As China is Japan's most important export market, a high number of Japanese firms report Chinese segment data in their annual filings. Furthermore, the scholars receive transaction-level trade data which enables them to determine the sales fraction of Chinese firms in Japan. Additionally, for operating exposure measures other than sales (e.g., number of employees), the authors examine companies' local subsidiaries overseas[80]. Chaney (2014) likewise determines the sales exposure level of French companies abroad, by collecting firm-level export data from the French Trade Agency[81].

Hence, the initial idea has been to collect transaction-level export data for European firms in Russia in order to determine the sales exposure of firms. However, contacting Raymond Fisman (Columbia Business School), Yasushi Hamao [82] (Marshall School of Business, University of Southern California), and Thomas Chaney (Toulouse School of Economics), the scholars pointed out that firm-level export data is not publicly available. Furthermore, gathering such data requires a complicated time-consuming approval process, infeasible given the study's timeline. Submitting a request to the European Trade Commission with regards to their Market Access Database (2014), a database showing trade flows of the EU (by very granular sector breakdown) on a country level (e.g., exports of Germany to

[77] Variables such as the controls, industry and geographic variables
[78] For the Japanese firms
[79] For the Chinese firms
[80] By looking into the overseas subsidiaries, the authors gather information about sales, employees, and assets of the local subsidiaries
[81] Please note that the topic examined by Chaney (2014) is unrelated to our topic. Hence, his work is not discussed in more detail
[82] Please note that Yasushi Hamao is one of the co-authors of the paper published by Fisman et al. (2013)

Russia in a specified industry), has revealed that firm-level data is not accessible through this database.

A screening of prevailing alternative options has revealed FactSet's GeoRev (2014) as the only database relevant for the study, as it discloses a *"geographic sales breakdown for more than 18,000 companies"* according to their product description. As access to the database has not been granted[83], the data gathering process has been solely based on a broad screening of publicly available company documents. More precisely, operating exposure measures of European firms in Russia have been manually collected by examining annual reports, other company documents (e.g., investor presentations), and press releases. Upon the identification of companies' Russian subsidiaries (if disclosed) within annual documents, data collection has been further enhanced using the database Orbis (2014) which contains (depending on the company) detailed information about sales, assets, and number of employees for both the parent company and its (local) subsidiaries. Although mixing information from different data sources has not been the preferred method, the collection of a substantial amount of companies for our sample has been reliant on it (see next sub-section)[84]. When companies have multiple subsidiaries in Russia, the information on the different Russian subsidiaries has been added up.

7.2 Selection of Final Company Sample

As the title of our paper proposes the assessment of "*European stock market effects*", the study progresses with a clear focus on European companies[85]. Consistent with Murdoch and Sandler (2002) and Schneider and Troeger (2006) who argue that neighbor countries are affected more heavily by a conflict than any other country, one may hypothesize that the Crimean Crisis has the largest impact on European firms. This has led us to focus on European companies only and hence, abstain from an analysis of Asian and American companies. Finally, a closer look at Table 19 in the Appendix, reveals that European countries are more important trade partners for Russia than Asian or American countries, suggesting that European firms may be more heavily affected by the Crimean Crisis than firms from other continents. Moreover, a two-sided analysis, so the examination of the impact on both European and Russian firms, is not conducted within our study as political tensions not only occur between Russia and one specific country. Instead, the involvement of multiple countries opposing Russia, may

[83] Our academic institution (Stockholm School of Economics) has unfortunately no subscription for the Factset GeoRev (2014) database

[84] This is also consistent with the approach applied by Fisman et al. (2013)

[85] The term "*European companies*" refers to whether a firm is headquartered in Europe. Therefore, the country of listing is irrelevant. For instance, the company *"L'Occitane"* is considered to be a French company although it is listed in Hong Kong

potentially lead to falsified results when examining Russian firms. Furthermore, operating exposure measures may not be suited for the analysis of Russian firms, as sanctions of the Western World are primarily targeted at the financial sector which implies that alternative measures (e.g., credit exposure) can be of higher relevance.

Although a broad sample comprising companies from diverse industries has been the initial goal of our sample selection, certain industries have been excluded due to the irrelevance of the chosen operating exposure measures. Accordingly, three industries have been further omitted from our sample set, namely the defense, utilities, and financial sector.

Numerous event studies show the positive impact of wars on defense stocks, causing a stock price movement in the opposite direction compared to non-defense stocks, when a war is fought, which may distort the study's results (see McDonald and Kendall, 1994; Attia, 1998; Shapiro and Switzer, 1999).

Second, the utilities sector which includes companies from the energy[86] and mining[87] industry has been excluded, based on two reasons: First, the sector is highly dependent on commodity prices which are set on the world market, consequently reducing the relevance of the chosen operating exposure measures[88]. Second, consistent with the study of Guidolin and La Ferrara (2007) on global mining companies operating in Angola, it can be inferred that the location of the mine may be more relevant than the chosen operating exposure measures. Although specific data on the location of the mines is disclosed in the annual report, the study abstains from using this information, as the development of industry-specific exposure measures is not deemed its focus. Still, the utilities sector is highly relevant for Russia[89], requiring the development of industry-specific metrics, which is in contrast to the purpose of our study as discussed in Section 5.4.

Finally, companies from the financial sector (not only banks but also insurance or investment companies[90]) have been also omitted for a variety of reasons consistent with Fisman et al. (2013). Analogous to the utilities sector, the financial sector may require the development of tailored, more industry-specific operating exposure measures, with credit exposure in Russia probably being the most relevant one.

[86] For example companies like E.ON SE and Statoil ASA
[87] For example Anglo American
[88] Although the Crimean Crisis affects commodity prices, it suggests that the chosen operating exposure measures are irrelevant as changes in commodity prices (set on the world market) affect all companies similarly (regardless of their operating exposure to Russia)
[89] Which implies that the Crimean Crisis may have a big effect on the utilities sector (and its stocks)
[90] Refers primarily to Private Equity and Venture Capital

After limiting the appropriate set of companies to European firms not operating in the utilities, financial, or defense industry, the S&P Europe Broad Market Index (BMI)[91], a European equity index consisting of 1,808[92] equities from a variety of countries / regions, different sectors / industries, and different sizes (small- to large-cap) has been chosen as an initial starting point. Table 7 provides a detailed overview of our data derivation process.

Table 7 – Final Sample Derivation

Sample Derivation Funnel

The table outlines how the study's sample was derived

	Sample Size
S&P Europe Broad Market Index (BMI)	**1808**
Financial services companies	-352
Utility companies	-71
Defense companies	-15
Pre-selection sample	**1370**
Observations with incomplete data on operating exposure measures	-873
Observations with zero exposure to Russia	-237
Observations with incomplete historical stock data (e.g., recent IPO)	-11
Pre-Final sample	**249**
Observations with extreme CARs (higher than +/-20% intraday)	-20
Final Sample	***229***

Description: This Table provides an overview of how the final sample was derived from an intial data set. Initially the selection process started off with an intial sample of 1,808 companies comprising the constituents of the S&P BMI. By eliminating various industries (such as utilities, financial and defense) and additionally exduding outliers and observations with incomplete data, the Table shows how the sample finally arrives at 229 European firms

As highlighted, a universal data base has not been accessible to us. Instead, very time-consuming manual process has been executed which resulted in a final sample consisting of 229 companies. Eliminating 352 companies from the financial, 71 from the utilities, and 15 from the defense sector, left us with 1,370 companies. Accordingly, data collection has progressed with a manual investigation of 1,370 corporate annual reports, websites, and press releases, disclosing information about the companies' Russian activities. Furthermore, upon identification of companies' Russian subsidiaries, the database Orbis (2014) has been used to enlarge our final sample as information in annual reports is limited. Throughout the data gathering process additional 873 companies have been eliminated due to the absence of sufficient disclosures with regards to sales, assets and employees in Russia. Moreover, 237 companies have been omitted from the final sample lacking operations in Russia (e.g.,

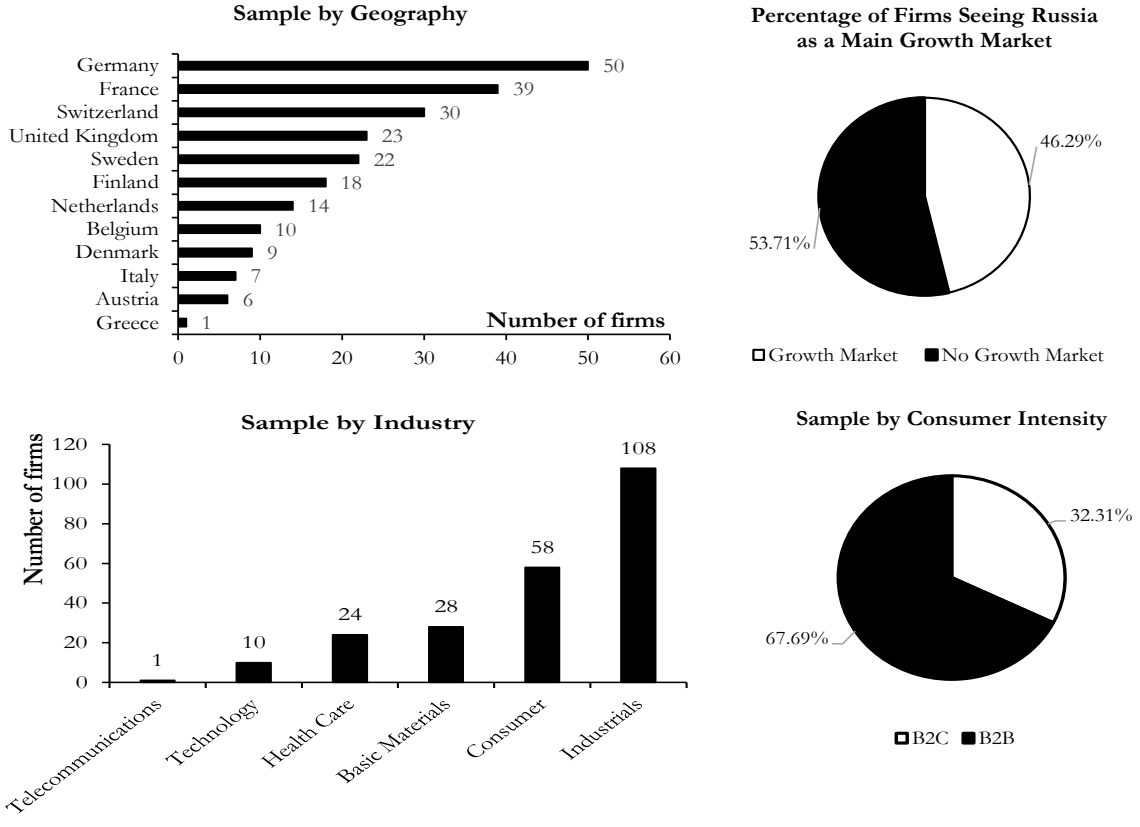
[91] A subset of the S&P Global BMI

[92] Please note that the S&P Europe BMI consists of 1815 constituents as some companies are counted twice (separate entries for A & B shares)

Sainsbury). In addition, 11 companies have been dismissed from our dataset for other reasons (e.g., recent IPO in 2014), leaving a pre-final sample of 249 companies. Finally, 20 outliers with extreme intraday *CARs* of >+20% / <-20% have been eliminated[93], yielding a final sample of 229 European companies.

As shown in Figure 3 below, our sample stems from 12 European countries, the majority of firms being headquartered in Germany, France, Switzerland, and the United Kingdom. Complementary, sample firms cover six major industries, with Industrials being the largest sector. The sample may be further divided into B2B and B2C oriented firms: about one third of sample firms derive the majority of total sales from end-consumers and two-thirds from businesses. With regards to the variable *Growth_Market*, 46.29% of firms regard Russia as one of their future key growth markets, whereas 53.71% do not. All in all, the sample of 229 European listed firms is well balanced as it covers all major European economies. Nevertheless, the inclusion of sample firms has been clearly dependent on reporting quality of respective countries and sectors. In this respect, Sweden and Switzerland contribute a remarkably high amount of firms to the study sample, due to their outstanding reporting quality compared to peer countries with similar size and economic strength.

Figure 3 – Detailed Overview of Study Sample



[93] It is assumed that these extreme *CARs* are due to merger announcements / rumors

7.3 Issues Pertaining to Data Selection and Operating Exposure Measures

A very time consuming data gathering process has been necessary to ensure a clean sample. However, several issues with regards to our data remain. Primarily, data retrieved from Orbis (2014), or press releases may be imprecise. However, when data was taken from these sources, several sanity checks to ensure data accuracy have been performed. As companies usually disclose *"Eastern European sales"* or *"BRIC sales"*, a reference point about the size of Russian sales has been set in annual reports, allowing for extensive cross-checks. Furthermore, from the content analyses of annual reports, the accuracy of Orbis figures have been further tested, when the respective company considers Russia as an *"important market"*. In cases uncertainties have still remained, the company has not been included in the final sample.

8. Results and Analysis

In this section, the results of our analyses are outlined. The section commences with a brief description of our sample. Subsequently, first results confirm that firms exhibit significant negative CARs throughout the selected five event windows. Next, the results of regression analyses, indicate a significant negative relationship between CARs and Russian operating exposure. These are followed by an extensive discussion and interpretation with reference to previous literature. In a final step, operating exposure measures' partial explanatory power over ΔExpected_CF but not over ΔBeta is illustrated.

8.1 Summary Statistics

Our study is based on data of 229 listed European firms as described in Section 7. Hence, the studied sample is smaller, compared to the sample of our main reference literature by Fisman et al. (2013) who study 810 Japanese and 1,025 Chinese companies. The main reason for a lower sample size is related to the data gathering process as data from authorities has not been obtained in our case[94].

Table 8 – Overview of Sample Companies and CARs

Sample of 229 European Firms				
	Mean	**Median**	**SD**	**Observations**
Full Crisis Event Window				
CAR Full	-13.47%	-12.52%	30.36%	229
Operating Exposure Measures				
Total Assets (EURm)	13,665	3,332	30,943	229
Fraction_Assets_RU	*3.42%*	*2.31%*	*4.45%*	*229*
Total Sales (EURm)	10,476	3,186	20,501	229
Fraction_Sales_RU	*4.01%*	*3.00%*	*4.85%*	*229*
Total Employees (Total)	40,548	12,904	71,062	229
Fraction_Employees_RU	*4.44%*	*2.43%*	*5.77%*	*229*
Company Characteristics				
Leverage	35.53%	37.16%	21.13%	229
Tobin's Q	0.70	0.66	0.21	229
Market Capitalization (EURm)	12,348	2,536	25,960	229

Notes: Fraction_Sales_RU is the ratio of sales in Russia to total sales for the sample of European firms; Fraction_Assets_RU is the ratio of assets in Russia to total assets; Fraction_Employees_RU is the ratio of employees in Russia to total employees; Leverage is the ratio of a firm's net debt to total capital; Tobin's Q is the ratio of total capital to the book value of total assets; Market Capitalization equals the number of shares outstanding * the share price as of December 31, 2013

Description: The Table provides an overview of essential inputs for regression models. As the diverse exposure measures have already been explained within Section 5, the reader's familiarity with those is assumed at this point. The section "Full Crisis Event Window" shows the mean, median, standard deviation (SD) and the number of observations for cumulative abnormal returns during the Full Crisis Period (denoted with "CAR Full"). The following two dimensions "Operating Exposure Measures" and "Company Characteristics" outline mean, median, SD and observations for the various exposure measures and company characteristics. The aim of the table is to give the reader a detailed understanding of how diverse the sample of firms actually is in terms of size, leverage, sales exposure and Cumulative Abnormal Returns.

[94] Please note that Fisman et al. (2013) have obtained extensive data from Chinese and Japanese authorities

Table 8, provides further information about our sample's average and median asset values, sales, and number of employees. In essence, the majority of sample companies are large-cap firms with average total assets of €13.7 billion and an average market capitalization of €12.3 billion [95] . Additionally, *Fraction_Sales_RU* and *Fraction_Assets_RU* is lower than the corresponding Chinese and Japanese exposures in the study by Fisman et al. (2013) which is primarily related to the higher economic interdependencies between China and Japan. Table 22 in the Appendix provides a more detailed overview of the summary statistics and sample configuration on a firm-level.

8.2 Cumulative Abnormal Returns

Fisman et al. (2013) highlight significant negative CARs for Japanese and Chinese firms. The scholars find that CARs equal -5.8% for Japanese and -3.8% for Chinese firms in the Textbook event. To verify hypothesis *H1*, *CARs* are calculated over each of the five defined event windows. Table 9 illustrates *CARs* for all five event windows and their statistical significance as the starting point of our study.

Table 9 – Results of Cumulative Abnormal Returns

Overview of Cumulative Abnormal Returns for Diverse Event Windows

	Full Sample (n=229)				
	Trading Days	**Avg. CAR**	**T-Stat**	**p-Value**	**Significance**
Event Window Selection					
Full	146	-13.47%	6.72	0.00	**YES**
Intensity	17	-6.23%	12.29	0.00	**YES**
Terrorists	5	-2.29%	9.42	0.00	**YES**
MH17	3	-1.24%	6.97	0.00	**YES**
Sanctions	10	-4.97%	10.04	0.00	**YES**

Description: Significance Testing is conducted applying a two-tailed student's t-test using n-1 degrees of freedom and an alpha of 0.05. Consequently, all five event windows (starting with "Full" for the Full Crisis Window) prove to show negative cumulative abnormal returns over their respective windows. Estimation of the market model was performed pre-crisis for all event windows in order to achieve an unbiased estimation of forecasted stock returns. Besides the trading days of each window outlined in column 2, the following columns denote average CARs of the windows, and their respective T-Stats and p-Values. The last column "Significance" then provides a judgement on whether the CARs around the respective event windows are statistically significant. As the table shows, all five CARs are negative and signifiance over their respective event windows. This leads to the support of H1.

In line with existing research on interstate frictions and wars (e.g. Fisman et al., 2013; Abadie and Gardeazabal, 2003), significant negative *CARs* throughout all five event windows are confirmed. Accordingly, our initial findings suggest a clear negative reaction of European sample firms to crisis-related events. Across all five event windows, *CARs* are negative and

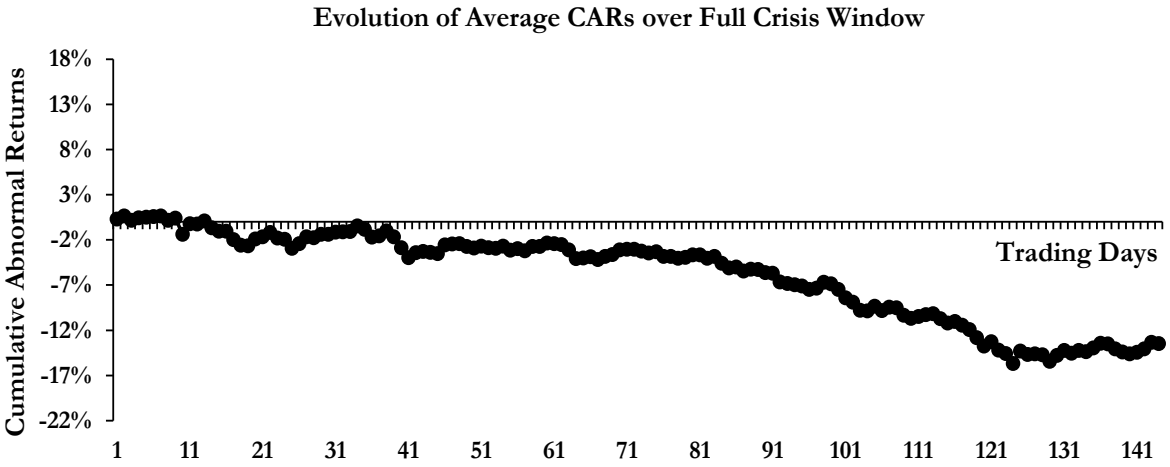
[95] Please note that the median total asset value amounts to €3.3 billion and to median market capitalization of €2.5 billion

statistically significant at the 1% level ranging from average *CARs* of -13.47%[96] for *Full* to -1.24% for *MH17*. Apparently, the most significant T-statistic of 12.3 is found for the event window *Intensity* causing average *CARs* of -6.23%.[97]

Looking at *CARs*, the null-hypothesis that mean cumulative abnormal returns are zero is rejected, using the results provided in this section. Considering *CARs* of individual event windows, interesting results prevail: The drastic but less economically significant event such as *MH17* has a less negative effect on our sample[98] than sanction announcements which have long-term restraining effects on the firms' businesses. Furthermore, longer event windows have more negative *CARs* confirming our methodology to conduct the regressions over the event window *Full* to capture the full effect of the Crisis[99]. Figures 4-5 graphically illustrate the development of *CARs* over the event periods *Full*, and *Intensity*.

Following the logical sequence of our hypotheses (see Figure 6 in Appendix) *H1*, the existence of significant negative CARs throughout the event window *Full* as well as the other event windows, is confirmed. Subsequently, the study proceeds with testing *H2a-H2c*, the explanatory power of our operating exposure measures over *CARs*.

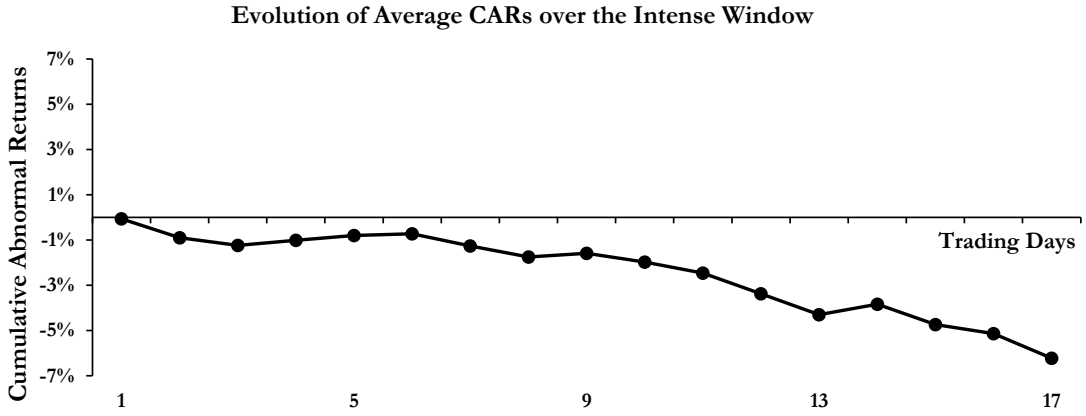
Figure 4 – CARs Full Crisis Window



Note: At point in time t, the average CAR of the sample equals the sum of average CARs of all event window trading days until and including day t for all sample companies. Therefore Figure 4 shows how average CARs evolve over the Full Crisis Window.

[96] The median amounts to -12.5%
[97] For an overview on event windows and most critical events, please refer to the Methodology Section 6.1
[98] Please note that no airline companies are included in our sample
[99] The Crimean Crisis is lacking one major event but consists instead of multiple crisis-related events spanning over a period from February 14 to September 5, 2014 as discussed

Figure 5 – CARs Intense Window



Note: At point in time t, the average CAR of the sample equals the sum of average CARs of all event window trading days until and including day t for all sample companies. Therefore Figure 5 shows how average CARs evolve over the Intensity Window.

8.3 Operating Exposure Measures and CARs

8.3.1 Outline of Results

Commencing with Table 11 (shown at the end of the subsection), support for hypotheses *H2a – H2c* is clearly found. In columns (1) – (12), the significance of *Fraction_Sales_RU, Fraction_Assets_RU, Fraction_Employees_RU* and *Growth_Market* is confirmed.

H2a: Sales Exposure

Table 11, column (1) represents the starting point with *Fraction_Sales_RU* on a stand-alone basis. The coefficient of the sales variable is negative and significant at the 1% level. Its coefficient of -0.722 infers that *CARs* change by -0.722% for each corresponding 1% increase in a firm's *Fraction_Sales_RU*. In column (2) the results show that the relationship between *Fraction_Sales_RU* and *CARs* during the Full Crisis Period is rather insensitive to the addition of control variables. Moreover, columns (7) – (12) illustrate that *Fraction_Sales_RU* remains significant when adding the additional operating exposure measures *Fraction_Assets_RU, Fraction_Employees_RU,* and *Growth_Market*. In column (12) the coefficient increases up to -1.783, implying that a 1% increase in *Fraction_Sales_RU,* so 1% more Russian sales exposure, causes a decrease in *CARs* of -1.783%. In most cases *Fraction_Sales_RU* remains significant at a 1% level, when adding additional variables. However, when adding the variable *Fraction_Assets_RU* as in column (7), the negative coefficient is slightly down to -0.602 and only significant at a 10% level, most likely a result of the high positive correlation coefficient between *Fraction_Sales_RU* and *Fraction_Assets_RU* of 0.793 (see Table 17 in Appendix for an overview of the different correlation coefficients of all our variables or Table 10 in Text for a condensed overview of correlations). Hence, the effect of *Fraction_Sales_RU* may be partly

captured by the *Fraction_Assets_RU* variable. On a final remark, the combination *Fraction_Sales_RU* with *Fraction_Employees_RU* (see column (3) for example) provides additional evidence that the positive coefficient of *Fraction_Employees_RU* increases the negative coefficient of *Fraction_Sales_RU* due to the strong positive correlation of 0.794 (once again, please refer to Table 17 in Appendix or Table 10 in Text).

H2a: Asset Exposure

Column (3) of Table 11 suggests similarly as in column (1) for *Fraction_Sales_RU*, a smaller significant negative impact of *Fraction_Assets_RU* on *CARs* with a coefficient of -0.685, significant at a 5% level. When adding all other operating exposure measures and controls in column (12) the coefficient of *Fraction_Assets_RU* becomes even more negative and amounts to -0.979, significant at the 10% level. Looking at column (7), the only case where *Fraction_Assets_RU* is not significant, demonstrates once again that the positive correlation between *Fraction_Assets_RU* and *Fraction_Employees_RU* affects the significance levels and coefficients of both variables.

H2b: Employee Exposure

In columns (8) – (12) of Table 11, the explanatory power of *Fraction_Employees_RU* is illustrated, suggesting a significant positive impact on *CARs* at the 1% level. Hence, the coefficient of +2.026 in column (12) suggests that a 1% increase of *Fraction_Employees_RU* increases *CARs* by +2.026%. In either of the outlined model specifications (columns (8) – (12)), the coefficient of *Fraction_Employees_RU* has a significant positive impact on *CARs* at a 1% level, providing strong support for hypothesis *H2b*. Only in columns (5) and (6), *Fraction_Employees_RU* is insignificant which is primarily related to the absence of the other operating exposure measures *Fraction_Assets_RU* and *Fraction_Sales_RU*. These two variables both have a negative coefficient (as discussed) but a very strong positive correlation with *Fraction_Employees_RU* of 0.742 and 0.794 respectively (see again Table 17 in Appendix) and consequently reinforce the effect on the coefficient *Fraction_Employees_RU*. The high correlations are intuitive as firms need (sales) staff within the region they market their products and a developed infrastructure (assets). To conclude, *Fraction_Employees_RU* has a (positive) offsetting effect on the negative impact of *Fraction_Sales_RU* and *Fraction_Assets_RU* with regards to the response variable *CARs*.

H2c: Dummy Growth Market

The variable *Growth_Market*, a dummy variable[100] reflecting upon the company's growth aspiration in the Russian market, has a significant negative impact on *CARs* in all modifications (see Table 11, columns (9) – (12)). Although the coefficient is rather small and amounts to -0.1, it is significant at a 5% level in all cases which supports *H2c* and suggests that firms with high future growth aspirations into the Russian market have more negative *CARs* of -0.1%.

8.3.2 Interpretation of Results

The regression outcomes for the *Full* event window provide substantial support for hypotheses *H2a-H2c* implying a significant negative impact of *Fraction_Sales_RU, Fraction_Assets_RU,* and *Growth_Market* and a significant positive impact *Fraction_Employees_RU* with regards to the response variable *CARs*, as initially hypothesized.

The negative influence of *Fraction_Sales_RU* and *Fraction_Assets_RU* on *CARs*, seems reasonable and suggests that for firms with a high fraction of current sales in Russia, a higher fraction of total sales is put under risk. Hence, firms with high *Fraction_Sales_RU* depend more on Russia and consequently are subject to higher negative *CARs* in sum, as investors may be more extensively worried about the impact of the conflict on firms with high *Fraction_Sales_RU* than for firms with low *Fraction_Sales_RU*. Likewise, the higher *Fraction_Assets_RU* for a specified firm, the more affected is the firm with regards to the political developments in Russia, as having especially fixed assets in Russia suggests that firms can easily become subject to government retaliation as noted by Holehouse (2014) for British firms: *"Russia has issued a threat to seize the assets of British companies […] as a retaliation against David Cameron's demand for tough sanctions"*.

Alternatively, the positive effect of *Fraction_Employees_RU* on *CARs* suggests that the Russian government is more reluctant to harm foreign firms providing substantial employment to the Russian population. Considering that Russia is a former communist country which still experiences high government involvement in the economy, the results underline that 25 years after the end of the Iron Curtain and the Soviet Union, the Russian government is still heavily framing the landscape of the Russian economy. Our results are also consistent with the results of Fisman et al. (2013) who note an even more pronounced effect on CARs for Japanese firms employing a high share of employees in China, a country still in

[100] Taking the value 1 when the firm has high future growth aspirations and 0 otherwise

communism and therefore with a very high degree of government involvement in the economy.

The relatively small coefficient of the dummy variable *Growth_Market* which is based on qualitative content analysis, suggests that a more quantitative measure reflecting upon the company's future growth aspirations in Russia may be a more useful one. Especially considering that the value of a firm is defined as its discounted future cash flows (Koller et al., 2010), so company fundamentals derived in the future, more negative coefficients have been expected for *Growth_Market*. However, a more quantitative Russian growth measure cannot be established as our data solely relies on publicly available sources.

Furthermore, the only significant control variable is *Total_Assets*, reflecting upon the size of the sample companies. The coefficient of +0.008 in column (12) at a 1% significance level suggests that larger firms show slightly higher *CARs*. However, as the coefficient is very small and the other control variables *Leverage* and *Tobin's Q* are insignificant under all circumstance (also in the subsequent regressions) a further discussion and interpretation of the control variables is avoided.

To conclude, these results for European firms during the Crimean Crisis underline the explanatory power of the chosen operating exposure measures on *CARs* and further strengthen the analysis of Fisman et al. (2013). Even more, our results confirm the applicability of these operating exposure measures in a broader multi-country[101] setting to examine the impact of interstate frictions. Once again referring to Appendix Figure 6 and following our logical sequence of hypotheses, *H3a-H3c* will be tested next, as significance for *H2a-H2c* is established.

Table 10 – Correlation Operating Exposure Measures for Full CAR Sample

Correlation betwen Operating Exposure Measure Variables				
229 Sample Companies over the Full Crisis Period				
	Fraction_ Sales_RU	**Fraction_ Employees_RU**	**Fraction_ Assets_RU**	**Growth_ Market**
Fraction_Sales_RU	1.000			
Fraction_Employees_RU	0.794	1.000		
Fraction_Assets_RU	0.793	0.742	1.000	
Growth_Market	0.112	0.074	0.059	1.000

Notes: Fraction_Sales_RU is the ratio of sales in Russia to total sales for the sample of European firms; Fraction_Assets_RU is the ratio of assets in Russia to total assets; Fraction_Employees_RU is the ratio of employees in Russia to total employees; Growth_Market is a dummy variable denoting 1 if Russia is recognized as a growth market in a firm´s annual report and 0 if Russia is not a target

[101] The term *"multi-country setting"* refers to the fact that the effect of interstate frictions between Russia and our 12 European sample companies is studied, whereas Fisman et al. (2013) study the impact of interstate fractions only between two countries, China and Japan

Table 11 – Regression Results of Operating Exposure Measures on CARs

Dependent variable	***CAR Full*** **(1)**	***CAR Full*** **(2)**	***CAR Full*** **(3)**	***CAR Full*** **(4)**	***CAR Full*** **(5)**	***CAR Full*** **(6)**	***CAR Full*** **(7)**	***CAR Full*** **(8)**	***CAR Full*** **(9)**	***CAR Full*** **(10)**	***CAR Full*** **(11)**	***CAR Full*** **(12)**
Fraction_Sales_RU	**-0.722*** **	**-0.709*** **					**-0.602***	**-1.882*** **	**-1.703** **	**-1.701** **	**-1.748*** **	**-1.783*** **
	(0.236)	(0.232)					(0.313)	(0.687)	(0.672)	(0.668)	(0.658)	(0.660)
Fraction_Assets_RU			**-0.685** **	**-0.654** **			-0.165	**-0.921***	**-0.998***	**-0.989***	**-0.981***	**-0.979***
			(0.305)	(0.324)			(0.387)	(0.495)	(0.511)	(0.516)	(0.517)	(0.538)
Fraction_Employees_RU					0.153	0.199		**1.936*** **	**1.922*** **	**1.913*** **	**1.933*** **	**2.026*** **
					(0.269)	(0.283)		(0.482)	(0.458)	(0.443)	(0.443)	(0.454)
Growth_Market									**-0.094** **	**-0.094** **	**-0.091** **	**-0.099** **
									(0.039)	(0.039)	(0.039)	(0.039)
Leverage		-0.018		-0.013		-0.016				-0.016	-0.002	-0.024
		(0.141)		(0.141)		(0.141)				(0.123)	(0.127)	(0.136)
Tobin´s Q		0.017		0.016		0.016					0.015	0.016
		(0.014)		(0.014)		(0.014)					(0.014)	(0.014)
Total_Assets		**0.005***		**0.005***		**0.006** **						**0.008*** **
		(0.003)		(0.003)		(0.003)						(0.003)
Constant	**-0.106*** **	**-0.141*** **	**-0.111*** **	**-0.148*** **	**-0.141*** **	**-0.179*** **	**-0.105*** **	**-0.114*** **	**-0.074** **	-0.068	**-0.103***	**-0.111***
	(0.023)	(0.056)	(0.023)	(0.056)	(0.026)	(0.057)	(0.024)	(0.026)	(0.032)	(0.048)	(0.062)	(0.061)
No. of obs.	**229**	**229**	**229**	**229**	**229**	**229**	**229**	**229**	**229**	**229**	**229**	**229**
R-square	0.013	0.025	0.011	0.022	0.001	0.014	0.014	0.059	0.082	0.082	0.087	0.100
R-square adjusted	0.009	0.008	0.006	0.004	0.000	0.001	0.005	0.046	0.066	0.062	0.063	0.072

Notes: CAR_Full is the cumulative abnormal return for European sample firms over the full crisis period (February 14, 2014 to September 05, 2014); Fraction_Sales_RU is the ratio of sales in Russia to total sales for the sample of European firms; Fraction_Assets_RU is the ratio of assets in Russia to total assets; Fraction_Employees_RU is the ratio of employees in Russia to total employees; Growth_Market is a dummy variable denoting 1 if Russia is recognized as a growth market in a firm's annual report and 0 if Russia is not a target market; Leverage is the ratio of a firm's net debt to total capital; Total_Assets refers to the book value of sample firms' total assets; Tobin's Q is the ratio of total capital to the book value of total assets. In all cases abnormal returns are estimated using the market model. Robust standard errors for each coefficient are provided in parantheses. *,** and *** indicate significance at the 10%, 5% and 1% level. Regressions are run with heteroskedasticity-consistent standard errors.

8.4. Geographic and Industry Variables

8.4.1 Outline of Results

The introduction of additional industry and geographic variables as shown in Table 12, suggests support of hypotheses *H3a* and *H3c,* but only partial acceptance of *H3b*. Confirmation of *H3a* implies that both industry variables *Consumer_Intensity* and *Industy_Growth* have significant explanatory power over *CARs*. Instead, *H3b* is only partially accepted, as *GDP_Growth* and *FX_Development* are insignificant as hypothesized, but the variable *Germany* is significant and negative over *CARs*, implying that German firms have significant lower *CARs*. Adding these additional industry and macroeconomic variables does not impact the results from *H2a-H2c*, allowing for confirmation of *H3c* that the chosen operating exposure measures are robust to the introduction of industry and geographic variables.

H3a: Industry variables

In Table 12, the results of the extended regressions are outlined, including both industry and geographic variables. Columns (2) – (5) indicate a significant negative impact of *Consumer_Intensity* on *CARs* on a 5% – 1 0% level[102]. Referring to column (5), the most comprehensive model specification, *Consumer_Intensity* [103] is significantly negative with a coefficient of -0.128, implying that firms primarily selling to the end-consumers have significantly lower *CARs* of -0.128%[104] than other sample firms focusing on business-to-business customers.

Introducing *Industry_Growth* to the regression (see columns (1) – (5)) yields significant positive impact on *CARs* at a 5% level. As column (5) manifests the most comprehensive regression model, the coefficient of 1.48 implies that a 1% increase in *Industry_Growth* results in a 1.48% increase in *CARs*.

H3b: Geographic Variables

Looking again at Table 12, columns (4) – (5), the variables *GDP_Growth* and *FX_Development* are insignificant in all model specifications. Hence, country-specific macroeconomic developments and currency effects have no explanatory power over *CARs*. Columns (3) – (5) confirm a small but significant negative impact for *Germany*[105] at a 1% significance level.

[102] Significance level is subject to model specifications
[103] A dummy variable taking the 1 value when B2C and 0 when B2B
[104] Please note that for dummy variables, the coefficient corresponds to the change on the response variable. Furthermore *Consumer_Intensity* only captures the additional effects not attributable to the other variables such as *Fraction_Sales_RU*
[105] A dummy variable taking the 1 value for firms headquartered in Germany and 0 otherwise

Hence, German firms experience -0.115% lower CARs than non-German firms according to column (5).

H3c: Robustness of Operating Exposure Measures

Again looking at Table 12 columns (1) – (5), the robustness of the chosen operating exposure measures is confirmed. Hence, the results from H2a-H2c are still valid (or *"robust"*) after introducing additional industry and geographic variables. In all modifications *Fraction_Sales_RU* and *Fraction_Employees_RU* remain significant at the 1% level. Looking only at column (5), the most comprehensive regression including all variables, *Fraction_Assets_RU* and *Growth_Market* are both significant at a 5% level. Furthermore, the coefficients of the operating exposure measures do not change their sign. Even more, no significant changes in the coefficient compared to the previous model specification can be observed (see column (5), Table 12 versus column (12) Table 11).

8.4.2 Interpretation of Results

Our results confirm *H3a* that both *Consumer_Intensity* and *Industry_Growth* have explanatory power over *CARs*. A possible explanation for the negative coefficient of *Consumer_Intnensity* is that increased consumer sentiment against European products may have affected Russian consumers' decisions to purchase products from EU companies as discussed by many other researchers[106] (see for example Gupta and Yu, 2009; Prieger et al., 2010). The significance of *Industry_Growth* is more intuitive, implying that high-growth industries, so industries with high growth of the corresponding MSCI Sector Index, experience higher *CARs* than low-growth industries. Hence, the firm profits from the overall industry dynamic which impacts *CARs*.

Although the latter results suggest that *Industry_Growth* is significant, the significance for *GDP_Growth* cannot be confirmed. Our interpretation suggests that *GDP_Growth* is relatively meaningless when looking at the company's performance, as firms in Europe engage in business activities across the world, a result of the European integration and the globalization overall. Hence, *GDP_Growth* is relatively unrelated to *CARs* as firms can generate the majority of sales in a country with a different GDP growth rate than the one applied in the regression. In essence, this is also the main hypothesis examined in *H2a-H2c* suggesting that not the economic development of the home country is explaining *CARs,* but instead the exposure to different other countries and the economic (and political) development in these countries. Although *GDP_Growth* is insignificant, *Germany* is significant

[106] Please note that the researchers do not specifically discuss the Russian – European context but rather generally provide findings on consumer sentiment

(to a small degree) which is contradictory to the interpretation that the company's headquarter is irrelevant. The significance of *Germany* may be explained by increased consumer sentiment in Russia towards German products due to Germany's proactive support of pro-European forces in Ukraine. Furthermore, the high importance of the Russian market for German firms, may result in an additional exposure not captured in the other operating exposure variables (see Table 19, Appendix for main trade partners of Russia). In contrast, with regards to *FX_Development* our initial hypothesis is confirmed, so currency changes do not impact *CARs.* Although a Ruble depreciation over the *Full* event window (see Figures 9, Appendix) suggests that foreign products have become more expensive for Russian consumers, a significant impact on *CARs* is not observed. This can be interpreted from three different angles: First, looking at Figure 10[107] in the Appendix reveals that the majority of currency depreciation occurred prior to the event window, more precisely in January, 2014. Hence, a potential effect of *FX_Development* may be more pronounced during that period. Second, although foreign goods become more expensive when the Ruble depreciates, costs incurred in Ruble (e.g., salaries for Russian workers) are reduced, which suggests that the negative effect of a Ruble depreciation is reversed by a positive effect. Finally, screening through the annual reports during the data gathering process has revealed that most of the sample firms hedge against their currency risks. Hence, only partial acceptance of *H3b* is found as *Germany* is significant while *FX_Development* and *GDP_Growth* are insignificant.

Furthermore, support for *H3c* is found as the significance of the operating exposure measures remains upon the introduction of additional industry and geographic variables. Our results are in line with Fisman et al. (2013) who prove the robustness of their operating exposure measures when introducing additional industry variables.

Finally, column (5), Table 12, the most comprehensive model specification, illustrates that our regression analyses yield a pseudo R-square of 14.5% or an adjusted R-square of 9.7% implying that many other factors may influence *CARs*. Therefore, a relatively low fit of our regression model in explaining *CARs* is found. However, as the purpose of our study is not to develop a comprehensive model to predict *CARs,* but instead to assess whether the chosen variables have a significant explanatory power over *CARs,* the R-square values are less relevant for our results. It should be noted that our main reference paper by Fisman et al. obtains

[107] Figure 10 in Appendix shows the currency development RUB~Home currency from January 1, 2014 – November 5, 2014, whereas Figure 9 in Appendix shows only the exchange rate development over the event *Full*

pseudo R-Square values in the similar range of around 10% depending on the model specification[108].

Table 12 – Regression Results of Industry and Geographic Variables on CARs

Expansion of Operating Exposure Measures towards Industry and Geographic Factors

Dependent variable	***CAR Full*** (1)	***CAR Full*** (2)	***CAR Full*** (3)	***CAR Full*** (4)	***CAR Full*** (5)
Fraction_Sales_RU	**-1.941*** **	**-2.011*** **	**-2.015*** **	**-2.013*** **	**-2.015*** **
	(0.711)	(0.634)	(0.606)	(0.608)	(0.598)
Fraction_Assets_RU	**-0.937***	**-0.953***	**-1.097** **	**-1.103** **	**-1.210** **
	(0.542)	(0.544)	(0.539)	(0.530)	(0.588)
Fraction_Employees_RU	**2.077*** **	**2.127*** **	**2.253*** **	**2.260*** **	**2.286*** **
	(0.457)	(0.463)	(0.452)	(0.453)	(0.449)
Growth_Market	**-0.097** **	**-0.094** **	**-0.085** **	**-0.085** **	**-0.086** **
	(0.039)	(0.039)	(0.040)	(0.039)	(0.040)
Leverage	-0.015	-0.014	-0.024	-0.025	0.039
	(0.133)	(0.131)	(0.128)	(0.039)	(0.125)
Tobin´s Q	0.015	0.016	0.011	0.012	0.009
	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)
Total_Assets	**0.006** **	**0.008** **	**0.003*** **	**0.003*** **	**0.003*** **
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Industry_Growth	0.585	**1.486** **	**1.508** **	**1.510** **	**1.480** **
	(0.516)	(0.717)	(0.715)	(0.716)	(0.709)
Consumer_Intensity		**-0.114***	**-0.127***	**-0.127** **	**-0.128** **
		(0.062)	(0.063)	(0.063)	(0.062)
Germany			**-0.107*** **	**-0.108*** **	**-0.115*** **
			(0.041)	(0.041)	(0.041)
FX_Development				0.213	0.365
				(0.109)	(1.115)
GDP_Growth					3.073
					(2.913)
Constant	**-0.139** **	**-0.161** **	**-0.132** **	**-0.130** **	**-0.130** **
	(0.062)	(0.063)	(0.063)	(0.065)	(0.064)
No. of obs.	**229**	**229**	**229**	**229**	**229**
R-square	0.105	0.121	0.141	0.141	0.145
R-square adjusted	0.073	0.085	0.101	0.097	0.098

Notes: CAR_Full is the cumulative abnormal return for European sample firms over the full crisis period (February 14, 2014 to September 05, 2014); Fraction_Sales_RU is the ratio of sales in Russia to total sales for the sample of European firms; Fraction_Assets_RU is the ratio of assets in Russia to total assets; Fraction_Employees_RU is the ratio of employees in Russia to total employees; Growth_Market is a dummy variable denoting 1 if Russia is recognized as a growth market in a firm's annual report and 0 if Russia is not a target market; Leverage is the ratio of a firm's net debt to total capital; Total_Assets refers to the book value of sample firms´ total assets; Tobin's Q is the ratio of total capital to the book value of total assets; Germany is a country dummy taking the value 1 if a firm is headquartered in Germany and 0 if a firm is headquartered in any other country; Customer_Intensity is a dummy variable taking 1 if a company can be classified as B2C and 0 if a company can be classified as B2B; FX_Development refers to a company's corresponding currency development (e.g., RUB/EUR) during the Crisis - The Ruble development with regards to the company's home currency (e.g., RUB/EUR of - 3%) implies that RUB depreciates by - 3% making EU products in Russia more expensive; Industry_Growth and GDP_Growth refer to growth within a copmany's respective industry and country of headquarter. In all cases abnormal returns are estimated using the market model. Robust standard errors for each coefficient are provided in parantheses. *,** and *** indicate significance at the 10%, 5% and 1% level. Regressions are run with heteroskedasticity-consistent standard errors.

[108] Please note that Fisman et al. (2013) do not disclose any adjusted R-square values when examining the short-run effects

8.5 Operating Exposure Measures and Fundamental Drivers of Valuation Theory

8.5.1 Outline of Results

Following the logical sequence of our hypotheses (see Figure 6 in Appendix) *H4a-H4b* are further tested to examine the explanatory power of operating exposure measures over Δ*Expected_CF*[109] and Δ*Beta*[110]. However, the final sample for the OLS regressions is reduced to 165 companies (from 229 companies) in this given section, as analyst consensus cash flow forecasts from the I/B/E/S database (2014) are not available for the entire sample. Furthermore extreme outliers with Δ*Expected_CF* >30% and Δ*Expected_CF* < -30% are excluded as it is assumed that these revisions stem from other company specific developments[111] (e.g., mergers).

The results in Table 13 indicate that *H4a* is confirmed, as operating exposure measures have no explanatory power over Δ*Beta*. In contrast, the results in Table 14 for the regression on the response variable Δ*Expected_CF* show only partial support of *H4b,* as *Fraction_Sales_RU* is the only operating exposure measure with explanatory power over Δ*Expected_CF*, implying that *Fraction_Assets_RU, Fraction_Employees_RU,* and *Growth_Market* have no statistical power.

H4a: Change in Beta

Table 13 shows that none of the operating exposure measures have explanatory power over Δ*Beta*. Even more, both the pseudo R-square and the adjusted R-square total a value of 0%[112] in all different model specifications shown (columns (1) – (12)), implying that the model provides no fit at all in explaining Δ*Beta*. Hence, *H4a* is clearly acctepted, as Δ*Beta* cannot be explained by operating exposure measures.

H4b: Change in Expected Future Cash Flows

Table 14, column (12) indicates that *Fraction_Sales_RU* is statistically significant at a 10% level. The coefficient of -1.569 infers that Δ*Expected_CF* change by -1.569% for each corresponding 1% increase in a firm's *Fraction_Sales_RU*. However, the other operating exposure measures are all statistically insignificant. In contrast, columns (3) – (6) reveal that *Fraction_Assets_RU* and *Fraction_Employees_RU* are statistically significant on a stand-alone basis, as well as when control variables are added. Nevertheless, when combining these variables with

[109] Underlying assumptions for the approximation of Δ*Expected_CF* as the change in company riskiness are outlined in Section 6.6

[110] Underlying assumptions for the approximation of Δ*Beta* as the change in company riskiness are outlined in Section 6.6

[111] Although extreme outliers with intraday CARs >+20% and <-20% are eliminated for the initial sample selection, additional companies are excluded as stock prices may react only to a limited extent for the buyer in mergers and acquisitions, but can lead to an extreme increase of future cash flows

[112] R-square in some cases even negative

Fraction_Sales_RU the explanatory power diminishes which may be primarily related to the high correlation shown in Table 21[113] in Appendix. This may also serve as an explanation for the reduced significance for *Fration_Sales_RU* in columns (8) – (12) compared to column (1). Finally, the pseudo as well as the unadjusted R-square are higher than in the regression for Δ*Beta,* amounting in the case of Δ*Expected_CF* to 12.6% and 8.7% respectively.

8.5.2 Interpretation of Results

The results from *H4b* suggest that *Fraction_Sales_RU* is the only operating exposure measure with explanatory power over Δ*Expected_CF*. Hence, our findings support only partially our initial hypothesis *H4b*. Considering that the value of a firm is defined as its discounted **future** cash flows, especially the dummy variable *Growth_Market* has been expected to be significant (see column (12) in Table 14). However, the study from Previts and Bricker (1994) suggests that equity research analysts[114] primarily derive their cash flow forecasts[115] based on current earnings figures which supports the results of *H4b*. The authors examine 459 sell-side analyst reports and conclude that analysts mostly rely on earnings-related information which confirms that Δ*Expected_CF* (hence analyst forecast revisions) are mainly based on earnings-related figures such as sales, but not on other operating measures such as assets or employees.

As indicated in Section 4.4 Wei and Zhang (2006) argue that changes in company fundamentals, such as sales, cause only changes in idiosyncratic risk. Hence, Δ*Beta*, a measurement of systematic risk, may not be explained by operating exposure measures, leading to confirmation of *H4a.*

[113] Please note that a new correlation table is provided as the sample for the last part our analysis is reduced from 229 companies to 165. Hence, correlations may have slightly changed. For the purpose of our analysis only the correlation between *Fraction_Sales_RU, Fraction_Assets_RU, and Fraction_Employees_RU* is provided for the smaller sample

[114] As discussed Δ*Expected_CF* is approximated by changes in cash flow forecasts of equity research analysts

[115] Which inputs are used to write equity research reports is a topic for itself and several researchers have devoted their work on how analysts process information (e.g., Block, 1999; or Bouwman et al., 1995)

Table 13 – Regression Results of Operating Exposure Measures on Changes in Betas

Dependent variable	ΔBeta *(Full)* (1)	ΔBeta *(Full)* (2)	ΔBeta *(Full)* (3)	ΔBeta *(Full)* (4)	ΔBeta *(Full)* (5)	ΔBeta *(Full)* (6)	ΔBeta *(Full)* (7)	ΔBeta *(Full)* (8)	ΔBeta *(Full)* (9)	ΔBeta *(Full)* (10)	ΔBeta *(Full)* (11)	ΔBeta *(Full)* (12)
Fraction_Sales_RU	-0.203	-0.264					-0.261	-0.090	-0.412	-0.316	-0.312	-0.264
	0.613	(0.632)					(1.791)	(2.635)	(2.328)	(2.433)	(2.42)	(2.422)
Fraction_Assets_RU			-0.154	-0.137			-0.075	-0.066	-0.231	-0.437	-0.424	-0.358
			(0.808)	(0.794)			(2.088)	(2.104)	(2.051)	(2.031)	(2.058)	(2.034)
Fraction_Employees_RU					-0.173	-0.298		-0.227	-0.151	-0.269	-0.267	0.374
					(0.507)	(0.551)		(0.999)	(0.960)	(1.077)	(1.087)	(1.111)
Growth_Market									0.076	0.064	0.065	0.076
									(0.070	(0.061)	(0.059)	(0.063)
Leverage		-0.134		-0.134		-0.138				-0.148	-0.146	-0.088
		(0.209)		(0.206)		(0.212)				(0.201)	(0.208)	(0.198)
Tobin´s Q		-0.001		-0.001		-0.001					-0.002	-0.001
		(0.023)		(0.023)		(0.023)					(0.023)	(0.023)
Total_Assets		-0.007		-0.007		-0.007						-0.008
		(0.004)		(0.004)		(0.004)						(0.004)
Constant	**0.194*** **	**0.261** **	**0.191*** **	**0.256***	**0.193*** **	**0.266***	**0.194*** **	**0.191*** **	**0.165*** **	**0.217** **	**0.212*** **	**0.123** **
	(0.043)	(0.128)	(0.048)	(0.130)	(0.048)	(0.144)	(0.044)	(0.039)	(0.037)	(0.081)	(0.105)	(0.105)
No. of obs.	**165**	**165**	**165**	**165**	**165**	**165**	**165**	**165**	**165**	**165**	**165**	**165**
R-square	0.001	0.011	0.001	0.011	0.000	0.012	0.001	0.002	0.007	0.011	0.011	0.019
R-square adjusted	-0.006	-0.013	-0.006	-0.013	-0.006	0.012	-0.012	-0.018	-0.017	-0.019	-0.026	-0.024

Notes: ΔBeta (Full) is the change in beta for European sample firms over the full crisis period (February 14, 2014 to September 05, 2014). Fraction_Sales_RU is the ratio of sales in Russia to total sales for the sample of European firms; Fraction_Assets_RU is the ratio of assets in Russia to total assets; Fraction_Employees_RU is the ratio of employees in Russia to total employees; Growth_Market is a dummy variable denoting 1 if Russia is recognized as a growth market in a firm's annual report and 0 if it is not a target market; Leverage is the ratio of a firms net debt to total capital; Total_Assets refers to the book value of sample firms' total assets; Tobin's Q is the ratio of total capital to the book value of total assets. In all cases abnormal returns are estimated using the market model. Robust standard errors for each coefficient are provided in parantheses. *,** and *** indicate significance at the 10%, 5% and 1% level. Regressions are run with heteroskedasticity-consistent standard errors. For this regression, the sample size was reduced to 165 due to the elimination of outliers and non-available cash flow forecasts.

Table 14 – Regression Results of Operating Exposure Measures on Changes in Cash Flow Forecasts

Dependent variable	ΔExpected *CF(Full)* (1)	ΔExpected *CF(Full)* (2)	ΔExpected *CF(Full)* (3)	ΔExpected *CF(Full)* (4)	ΔExpected *CF(Full)* (5)	ΔExpected *CF(Full)* (6)	ΔExpected *CF(Full)* (7)	ΔExpected *CF(Full)* (8)	ΔExpected *CF(Full)* (9)	ΔExpected *CF(Full)* (10)	ΔExpected *CF(Full)* (11)	ΔExpected *CF(Full)* (12)
Fraction_Sales_RU	**-1.231*** **	**-1.21*** **					**-1.976*** **	**-1.488***	**-1.568***	**-1.561***	**-1.563***	**-1.569***
	(0.381)	(0.384)					(0.727)	(0.808)	(0.808)	(0.807)	(0.812)	(0.817)
Fraction_Assets_RU			**-0.771***	**-0.746***			-0.970	-0.958	-0.984	-0.999	-1.005	-1.013
			(0.404)	(0.411)			(0.657)	(0.649)	(0.649)	(0.674)	(0.684)	(0.687)
Fraction_Employees_RU					**-0.605*** **	**-0.596*** **		-0.316	-0.304	-0.312	-0.313	-0.299
					(0.187)	(0.191)		(0.308)	(0.313)	(0.322)	(0.323)	(0.325)
Growth_Market									0.012	0.011	0.011	0.009
									(0.014)	(0.014)	(0.014)	(0.014)
Leverage		-0.012		-0.010		-0.025				-0.011	-0.012	-0.019
		(0.039)		(0.041)		(0.041)				(0.043)	(0.044)	(0.043)
Tobin´s Q		-0.001		-0.001		-0.001					-0.001	-0.001
		(0.005)		(0.005)		(0.005)					(0.006)	(0.006)
Total_Assets		0.001		0.001		0.001						0.001
		(0.001)		(0.001)		(0.001)						(0.001)
Constant	**0.067*** **	**0.068*** **	**0.046*** **	**0.046** **	**0.048*** **	**0.055** **	**0.065*** **	**0.061*** **	**0.056*** **	**0.060*** **	**0.062** **	**0.062** **
	(0.013)	(0.021)	(0.012)	(0.021)	(0.009)	(0.022)	(0.013)	(0.013)	(0.014)	(0.019)	(0.024)	(0.024)
No. of obs.	**165**	**165**	**165**	**165**	**165**	**165**	**165**	**165**	**165**	**165**	**165**	**165**
R-square	0.092	0.097	0.031	0.037	0.088	0.093	0.108	0.118	0.123	0.123	0.123	0.126
R-square adjusted	0.086	0.074	0.025	0.0133	0.083	0.070	0.097	0.102	0.100	0.095	0.089	0.087

Notes: ΔExpected_CF (Full) is the change in analyst consensus cash flow forecasts for European sample firms over the full crisis period (February 14, 2014 to September 05, 2014). Fraction_Sales_RU is the ratio of sales in Russia to total sales for the sample of European firms; Fraction_Assets_RU is the ratio of assets in Russia to total assets; Fraction_Employees_RU is the ratio of employees in Russia to total employees; Growth_Market is a dummy variable denoting 1 if Russia is recognized as a growth market in a firm's annual report and 0 if it is not a target market; Leverage is the ratio of a firm's net debt to total capital; Total_Assets refers to the book value of sample firms' total assets; Tobin's Q is the ratio of total capital to the book value of total assets. In all cases abnormal returns are estimated using the market model. Robust standard errors for each coefficient are provided in parantheses. *,** and *** indicate significance at the 10%, 5% and 1% level. Regressions are run with heteroskedasticity-consistent standard errors. For this regression, the sample size was reduced to 165 due to the elimination of outliers and non-available cash flow forecasts.

8.6 Limitations of Results

A concern with regards to our findings is their limited fit in explaining *CARs,* shown by the adjusted R-square of 0.098 and the pseudo R-square of 0.145 in the most comprehensive model specification (see Table 12, column (5)). However, as our study does not intend to explain all relevant factors causing abnormal returns, but to rather assess the explanatory power of the chosen operating exposure measures over *CARs,* R-square values are only of limited meaning. Instead, our findings reveal that several other factors (e.g., the ones delimitated in Section 5.4) may explain *CARs* and hence the R-square.

Furthermore, our operating exposure measures are unable to capture potential effects on suppliers with zero direct, but high indirect exposure to Russia through the supply of products and raw materials to directly-exposed firms. Hence, firms may have low direct exposure, but be highly dependent on the success of directly-exposed companies. Therefore, additional factors capturing indirect exposure of firms to Russia may be useful.

Finally, our findings may be biased (both positively and negatively) due to confounding events impacting *CARs,* as the event window spans over the entire Crimean Crisis, a 7-month period. However, as the Crimean Crisis consists of multiple different events lasting over a long period, an extended event window is crucial to capture the full crisis impact on stock markets. Accordingly, an even longer event window may be necessary to grasp the full crisis impact, in light of the more recent developments in Ukraine, such as the elections held in Luhansk and Donetsk by the separatists on November 2-3, 2014.

9. Concluding Remarks and Suggestions for Future Research

In this section, the main results and the contributions of our paper are summarized. Furthermore, potential limitations and suggestions for further research are discussed.

In essence, empirical results found in this study reveal large and adverse market reactions following major Crimean Crisis events, yielding significant negative cumulative abnormal returns across a diverse set of event windows.[116] Evidence is found for significant negative relationships between *Fraction_Sales_RU* / *Fraction_Assets_RU* and abnormal returns. Complementarily, our research results establish a significant positive relationship between *Fraction_Employees_RU* and *CARs*. The study further confirms a significant negative relationship between *Growth_Market* and *CARs* during the crisis.

Moreover, our regression analyses indicate that firms primarily engaging in the B2C segment, experience significantly lower returns over the full crisis period than firms in the B2B segment. Additionally, the findings prove a significant positive relationship between *Industry_Growth* and *CARs* over the full crisis period. Finally, German firms are found to exhibit more negative *CARs* than firms from other European countries. This may be attributed to Germany's leading role in opposing Russian's politics, as well as the strong dependency of the German economy on the Russian one, resulting in additional exposure not captured in the operating exposure measures. A full overview of the regression analyses and its results is provided in Table 16, in Appendix.

Concerning the application of the operating exposure-based model towards analyzing and understanding the underlying driving forces of valuation, our research findings highlight that *Fraction_Sales_RU* has explanatory power over Δ*Expected_CF*. Hence, suggestive proof underlines a negative relationship between *Fraction_Sales_RU* and Δ*Expected_CF*. Alternatively, our findings cannot approve the power of operating exposure measures to explain Δ*Beta* which may be related to their lack of long-term prediction power, which in turn, may not capture the underlying logic of changes in long-term firm riskiness, expressed by the beta. As a matter of fact, whether firm betas will shift due to the Crimean Crisis, may very well depend on the probability that its consequences go far beyond the year of 2014 and hence cause long-term consequences on financial markets. Such a phenomenon has been observed following the September 11 attacks which formed the starting point of the U.S.-led anti-terrorism operations[117] occurring in the aftermath and consequently increasing betas in the long-run

[116] Over the full crisis period, sample firms' stocks reacted by an average CAR of -13.5%
[117] Examples include the war in Iraq, Afghanistan, or Somalia

(Brounen and Derwall, 2010). The main results of the study are summarized below in Table 15.

Table 15 – Summary of Main Findings

Summary of Hypotheses

Hypotheses	Support?
H1: Cumulative Abnormal Returns	
H1: *CARs for our sample of 229 European firms are negative and statistically significant during the entire Crimean Crisis and selected major crisis events.*	**Yes**
H2: Operating Exposure Measures	
H2a: *Firms with a higher Russian sales and asset exposure exhibit higher negative cumulative abnormal returns over the full crisis.*	**Yes**
H2b: *Firms with a higher share of employees in Russia exhibit higher positive cumulative abnormal returns over the full crisis.*	**Yes**
H2c: *Firms with higher future growth expectations in the Russian market exhibit higher negative cumulative abnormal returns over the full crisis.*	**Yes**
H3: Industry and Geographic Variables	
H3a: *Industry variables have a significant impact on cumulative abnormal returns during the full crisis.*	**Yes**
H3b: *Geographic variables have no significant impact on cumulative abnormal returns during the full crisis.*	**Partial**
H3c: *Results from H2a-c are robust when adding additional industry and geographic variables.*	**Yes**
H4: Valuation Metrics	
H4a *Operating exposure measures have no significant impact on the change in company riskiness (approximated through beta change) during the full crisis.*	**Yes**
H4b *Operating exposure measures have a significant impact on the change in expected future cash flows (approximated through changes in consensus cash flow forecasts) during the full*	**Partial**

Description: The Table provides an overview of all 9 Hypotheses divided into four subsetions (H1-H4). Each individual hypothesis is first outlined as stated in the paper. For each Hypothesis the table provides an outcome which refers to whether or not it is supported by study results. Accordingly, the column "Support?" denotes a "Yes" if the hypothesis is supported, a "No" if the hypothesis is rejected, and a "Partial" if there is only partial support for the hypothesis.

To our knowledge, this paper is one of the very first to perform an in-depth firm-level analysis examining interstate frictions. The majority of scholars examine either the macroeconomic impact of wars and interstate frictions, or the impact of these conflicts on stock market indices. Hence, our detailed firm-level data enables us to better understand the impact of interstate frictions on the overall value of a firm. Furthermore, as our work builds on the analysis of Fisman et al. (2013) in a similar firm-level setting, their results can be confirmed in a more complex multi-country setting. As the authors remark in their paper: "*While we focus in this paper on China and Japan, our approach may clearly be generalized to a broader set of country pairs […]. This would give us a much broader set of institutional circumstances to study how economic, political, and social institutions mediate the effects of cultural animosity. We leave this for future work*" (Fisman et al. 2013, p.35), our study follows their suggestions. Even more, their analyses is expanded by introducing additional variables and linking the operating exposure measures to

the fundamental drivers of valuation theories. At the same time, our paper represents the first academic publication, focusing on the economic effects of the recent Crimean Crisis by quantifying stock market reactions and understanding their underlying logic by applying operating exposure measures and other variables. Furthermore, our results may also be used by practitioners and other scholars in order to assess potential firm value effects, following future events related to the Crimean Crisis.

However, our study may have potential limitations: First, our findings have only limited fit in explaining *CARs,* implying that many other variables are relevant. Second, the chosen operating exposure measures capture direct exposure only and therefore cannot account for sample firms' indirect exposure to Russia (e.g., suppliers of directly-exposed firms). These observations suggest that the operating exposure measures may be expanded by the variables outlined in Section 5.4. Finally, the study's event window may impose certain limitations: On the one hand, results may be biased due to confounding events occurring during the long event window between February and September 2014, on the other hand, the more recent hostile developments in the Crimean region may suggest that an even longer event window is necessary to capture the full impact.

From a broader societal perspective, it may be interesting to compare the relationships found to be valid for the Crimean Crisis to those in different political events (e.g., European stock market effects following the Swiss immigration referendum). By tailoring our approach to specific industry settings, future studies may develop more industry-specific exposure measures (e.g., utilities industries) to analyze the distinct effect of interstate friction on a specified industry and thereby increase the explanatory power of the exposure measures. Furthermore, a great potential for introducing new indirect exposure variables is found as our operating exposure measures are unable to capture potential effects on suppliers with zero direct exposure, but with high indirect exposure through the supply of products and raw materials to directly-exposed firms. Finally, scholars are advised, depending on the data availability, to expand our analysis by introducing the additional variables delimited in Section 5.4. All these potential directions seem intriguing and are left for future research to discover in more depth.

References

Periodicals

Abadie, A. and Gardeazabal, J. (2003), "The Economic Costs of Conflict: A Case Study of the Basque Country", *American Economic Review*, vol. 93, no. 1, pp. 113-32.

Al Refai, H. (2011), "The Impact of the Iraq War on the Country Beta of MENA Markets" *International Journal of Economics and Finance*, vol. 3, no. 2, pp. 12-17.

Ashenfelter, O. C., Ciccarella, S. and Shatz, H. J. (2007), "French Wine and the U.S. Boycott of 2003: Does Politics Really Affect Commerce?", *Journal of Wine Economics,* vol. 2, no. 1, pp. 55–74.

Attia, A.M. and Hassabelnaby, R.A. (1998), "The Oil Stock Market Reaction To The Gulf War", *Southwest Review of International Business Research*, vol.98, no.1, pp.206-215.

Bancel, F., Lathuille, Q. and Lhuissier, A. (2013), "Why is your WACC necessarily wrong?", *ESCP Working Paper*.

Bartov, E., Lindahl, F. W., and Ricks, W. E. (1998), "Stock Price Behavior Around Announcements of Write-Offs", *Review Of Accounting Studies*, vol. 3, no. 4, pp. 327-346.

Benoit, E. (1978). "Growth and defense in developing countries", *Economic Development and Cultural Change*, vol. 26, no. 2, pp. 271-280

Benos, E. and Jochec, M. (2013), "Patriotic Name Bias and Stock Returns", *Journal of Financial Markets*, vol. 16, no. 3, pp. 550-570.

Blattman, C. and Miguel, E. (2010), "Civil war", *Journal of Economic Literature*, vol. 48, no. 1, pp. 3-57.

Block, S. (1999), "A study of financial analysts: practice and theory", *Financial Analysts Journal*, vol. 55, no.4, pp. 86-95.

Bouwman, M., P., Frishkoff, P. and Frishkoff, P. (1995), "The relevance of GAAP-based information: a case study exploring some uses and limitations", *Accounting Horizons*, vol. 9, no. 4, pp. 22-47.

Bowman, E. H. (1984), "Content analysis of annual reports for corporate strategy and risk", *Interfaces*, vol. 14, no. 1, pp. 61-71.

Brounen, D. and Derwall, J. (2010), "The Impact of Terrorist Attacks on International Stock Markets", *European Financial Management*, vol. 16, no. 4, pp. 585-598.

Bruck, T. (2006), "War and reconstruction in northern Mozambique", *The Economics of Peace and Security Journal*, vol. 1, no. 1, pp. 30-39.

Brune, A., Hens, H., Rieger, M. O. and Wang, M. (2012), "The War Puzzle: Contradictory effects of international conflicts on stock markets", *Working Paper No. 688*, National Centre of Competence in Research Financial Valuation and Risk Management.

Carter, D. A. and Simkins, B. J. (2004), "The market's reaction to unexpected, catastrophic events: the case of airline stock returns and the September 11th attacks", *Quarterly Review of Economics and Finance*, vol. 44, no. 1, pp. 539–558.

Chaney, T. (2014), "The network structure of international trade", *American Economic Review*, forthcoming.

Chen, A. H. and Siems, T. F. (2004), "The effects of terrorism on global capital markets", *European Journal of Political Economy*, vol. 20, pp. 349–66.

Choudhry, T., (2010), "World War II events and the Dow Jones industrial index", *Journal of Banking and Finance,* vol. 34, no. 5, pp. 1022–1031.

Collier, P. (1999), "On the Economic Consequences of Civil War", *Oxford Economic Papers,* vol. 51, pp. 168-183.

Collier, P. and Gunning, J. W. (1999), "Explaining African Economic Performance", *Journal of Economic Literature*, vol. 37, no. 1, pp. 64-111.

Collier, P. and Hoeffler, A. (2004), "Greed and Grievance in Civil War", *Oxford Economic Papers* vol. 56, no. 1, pp. 563-595.

Collier, P., Hoeffler A. and Rohner, D. (2009), "Beyond Greed and Grievance: Feasibility and Civil War", *Oxford Economic Papers,* vol. 61, no. 1, pp. 1-27.

Cutler, D., Poterba, J. and Summers, L. (1989), "What Moves Stock Prices", *The Journal of Portfolio Management*, vol. 15, pp. 4-11.

Davis, C. and Meunier, S. (2011), "Business as Usual? Economic Responses to Political Tensions", *American Journal of Political Science*, vol. 55, no. 3, pp. 628-646.

De Melo M., Denizer, C. and Gelb, A. (1996), "From Plan to Market", *Policy Research Working Paper* 1564, World Bank, Washington DC.

de Soysa, I. (2002), "Paradise Is a Bazaar? Greed, Creed, and Governance in Civil War, 1989–99", *Journal of Peace Research,* vol. 39, no. 4, pp. 395-416.

Dolley, J. C. (1933), "Characteristics and Procedure of Common Stock Split-Ups", *Harvard Business Review*, vol. 11, no. 3, pp. 316-326.

Drakos, K. (2004), "Terrorism-induced structural shifts in financial risk: airline stocks in the aftermath of the September 11th terror attacks", *European Journal of Political Economy*, vol. 20, no. 2, pp. 435–46.

Eldor, R. and Melnick, R. (2004), "Financial markets and terrorism", *European Journal of Political Economy*, vol. 20 (2004), pp. 367–86.

Epstein, M. J. and Schnietz, L. E. (2002), "Measuring the Cost of Environmental and Labor Protests to Globalization: An Event Study of the Failed 1999 Seattle WTO Talks," *The International Trade Journal,* vol. 16, no. 2, pp. 129 – 160.

Fama, Eugene F. (1970), "Efficient Capital Markets", *The Journal of Finance*, vol. 25, no. 1, pp. 383-417.

Fearon, J. D. and Laitin, D. D. (2003), "Ethnicity, Insurgency, and Civil War", *American Political Science Review,* vol. 97, no. 1, pp. 75-90.

Fernandez P., Aguireamalloa, J. and Avendaño, L. C (2012). "Market Risk Premium Used in 82 Countries in 2012: A Survey with 7,192 Answers", *IESE Working Paper.*

Ferstl, R., Utz, S., & Wimmer, M. 2012, The Effect of the Japan 2011 Disaster on Nuclear and Alternative Energy Stocks Worldwide: An Event Study. *Business Research*, *5*(1): 25-41.

Filatov, A., Tutkevich, V. and Cherkaev, D. (2005). "Board of Directors at State-Owned Enterprises (SOE) in Russia", *Paper Prepared for the Russian Corporate Governance Roundtable Meeting*, Moscow, 2-3 June, 2005.

Fisman, R., Hamao, Y. and Wang, Y. (2013), "The Impact of Cultural Aversion on Economic Exchange: Evidence from Shocks to Sino-Japanese Relations", *Working Paper Columbia University*.

Frey, B. S. and Kucher, M. (2000), "History as Reflected in Capital Markets: The Case of World War II", *The Journal of Economic History*, vol. 60, no. 2, pp. 468-496.

Galvin, H. (2003), "The Impact of Defense Spending on the Economic Growth of Developing Countries: A Cross-Section Study", *Defence and Peace Economics*, vol. 14, no. 1, pp. 51–59.

Gaspar, J. and Massa, M. (2004), "Idiosyncratic Volatility and Product Market Competition", *INSEAD working paper*.

Gersovitz, M., and Kriger, N. (2013), "What Is a Civil War? A Critical Review of Its Definition and (Econometric) Consequences", *The World Bank Research* Observer, vol. 28, no. 2, pp. 159–90.

Gleditsch, N.P., Wallensteen, P., Eriksson, M., Sollenberg, M. and Strand, H. (2002), "Armed Conflict 1946–2001: A New Dataset", *Journal of Peace Research,* vol. 39, no. 1, pp. 615-637.

Gordon, P. and O'Hanlon, M. E. (2002), "Should the War on Terrorism Target Iraq? Implementing a Bush Doctrine on Deterrence", *Brookings Policy Brief 93*.

Guidolin, M. and La Ferrara, E. (2007), "Diamonds Are Forever, Wars Are Not: Is Conflict Bad for Private Firms?", *American Economic Review*, vol. 97, no.5, pp. 1978-1993.

Gupta, N. and Yu, X. (2009), "Does Money Follow the Flag?", Working Paper, Kelley School of Business, Indiana University.

Harvey, C. and Siddique, A. (2004), "The Cross-Section of Expected Risk Exposure", *Duke University Working Paper*.

Hegre, H., Ellingsen, T., Gates, S. and Gleditsch, N. P. (2001), "Toward a Democratic Civil Peace? Democracy, Political Change, and Civil War, 1816–1992", *American Political Science Review,* vol. 95, no. 1, pp. 33–48.

Humphreys, M. (2003), "Natural Resource, Conflict, and Conflict Resolution", *Working Paper*, Santa Fe Institute, Javeriana University.

Hwang, B. (2011), "Country-Specific Sentiment and Security Prices", *Journal of Financial Economics,* vol. 100, no. 2, pp. 382 – 401.

Isham, J., Kaufmann, D. and Pritchett, L. (1996), "Government and the Returns on Investment*", Working Paper No. 1550*, Policy Research Department, World Bank, Washington DC.

Karolyi, G. A. and Martell, R. (2006), "Terrorism and the stock market", *Working Paper*, Ohio State University.

Keshk, O., Pollins, B. and Reuveny, R. (2004), "Trade Still Follows the Flag: The Primacy of Politics in a Simultaneous Model of Interdependence and Armed Conflict", *Journal of Politics,* vol. 66, no. 4, pp. 1155-1179.

Kuhn, S. R. (2009), "Tsunami and conflict in Sri Lanka", *Working Paper*, Josef Korbel School of International studies, University of Denver.

Leach, G. (2003), "War and the World Economy", *Institute of Directors*, London.

Legvold, R. (2014), "Managing the New Cold War", *Foreign Affairs*, vol. 93, no. 4, pp. 74-84.

Leigh, A., Wolfers, J. and Zitzewitz, E. (2009), "Using Markets to Inform Policy: the Case of the Iraq War," *Economica*, vol. 76, no. 4, pp. 225-250.

Lintner, J. (1965), "The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets", *Review of Economics and Statistics,* vol. 47, no.1, pp. 13-37.

MacKinlay, C. A. (1997), "Event Studies in Economics and Finance", *Journal of Economic Literature,* vol. 35 (March), pp. 13–39.

Martin, P., Mayer, T. and Thoenig, M. (2008), "Make trade not war?", *Review of Economic Studies,* vol. 75, no. 3, pp. 865–900.

Mastroianni, D. P. N., Shapiro, D. M. and Switzer, L.N. (2011), "War and Peace: the Reaction of Defense Stocks", *The Journal of Applied Business Research*, vol. 15, no. 3, pp. 21-36.

McDonald, J.E. and Kendall, W.R. (1994), "Measuring the Economic Effects of Political Events: War and the U.S. Defense Industry: 1988-1992", *Journal of Applied Business Research*, vol. 10, no. 1, pp. 57-62.

Murdoch, J. C. and Sandler, T. (2002), "Economic Growth, Civil Wars, and Spatial Spillovers," *Journal of Conflict Resolution*, vol. 46, no. 1, pp. 91-110.

Obstfeld, M. and Rogoff, K. (1996), "Foundations of International Macroeconomics", MIT Press, Massachusetts.

Previts, G. and Bricker, R. (1994), "A content analysis of sell-side financial analyst company reports", *Accounting Horizons*, vol. 8, no. 2, pp. 55-70.

Prieger, J., Hu, W., Hong, C. and Zhu, D. (2010), "*French Automobiles and the Chinese Boycotts of 2008: Politics Really Does Affect Commerce*", Working Paper, Pepperdine University, School of Public Policy.

Ganegodage, K. R. and Rambaldi, A. N. (2014), "Economic consequences of war: evidence from Sri Lanka", *Journal of Asian Economics*, vol. 30, no. 1, pp. 42-53.

Schneider, G. and Troeger, V. E. (2006), "War and the World Economy: Stock Market Reactions to International Conflicts"*, Journal of Conflict Resolution*, vol. 50, no. 5, pp. 623-645.

Shapiro, D.M. and Switzer, L.N. (1999), "War and Peace: Reaction of Defense Stocks", *Journal of Applied Business Research*, vol. 15, no. 3, pp. 21-37.

Sharpe, W. F. (1964), "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk", *Journal of Finance,* vol. 19, no. 3, pp. 425-42.

Singer, D. J. and M. Small (1994), "Correlates of War Project: International and Civil War Data, 1816-1992", *Inter-University Consortium for Political and Social Research*, Ann Arbor, Michigan.

Sollenberg, M. and Wallensteen, P. (2000), "Armed Conflict, 1989-99", *Journal of Peace Research*, vol. 37, no. 5, pp. 635-649.

Teoh, S., Welch, S. and Wazzan, C. P. (1999), "The Effect of Socially Activist Investment Policies on the Financial Markets: Evidence from the South African Boycott", *Journal of Business,* vol. 72, no. 1, pp. 35 – 89.

Tobin, J. (1969), "A General Equilibrium Approach To Monetary Theory", *Journal of Money, Credit and Banking* vol. 1, no. 1, pp. 15-29.

Trueman, B. (1994), "Analysts Forecasts and Herd Behavior", Review of financial studies, vol. 7, no. 1, pp. 97-124.

Wei, S. and Zhang, C. (2006), "Why Did Individual Stocks Become More Volatile?" *Journal of Business,* vol. 79, no. 1, pp. 259-292.

Databases

Datastream (2014), Thomson Reuters Datastream, retrieved on October 28th, 2014 from http://wrds-web.wharton.upenn.edu/wrds/

Factset GeoRev Database (2014), retrieved on October 28th, 2014 from http://www.factset.com/data/company_data/geo_revenue

I/B/E/S (2014), Lynch, Jones & Ryan and Technimetrics, Inc, retrieved on October 28th, 2014 from https://wrds-web.wharton.upenn.edu/wrds/

Market Access Database (2014), European Union MADB retrieved on October 12th, 2014 from http://madb.europa.eu/madb/indexPubli.htm

OECD (2014), retrieved on November 12th, 2014 from http://stats.oecd.org/

Orbis (2014), retrieved on October 15th, 2014 from https://orbis.bvdinfo.com/version-2014121/home.serv?product=orbisneo

Trading Economics (2014), retrieved on November 12th, 2014 from http://www.tradingeconomics.com/

Monograph (Books)

Benoit, E. (1973), *Defense and Economic Growth in Developing countries*, Lexington Books, Boston, Massachusetts.

Bilmes, L. and Stiglitz, J. (2008), *The Three Trillion Dollar War: The True Cost of the Iraq Conflict*, WW Norton, New York.

Blomberg, S. B. and Hess, G. D. (2012), "How Much have Global Problems Cost the World? A Scorecard from 1900 to 2050", *In How Much have Global Problems Cost the World? A Scorecard from 1900 to 2050,* pp. 99-116, Cambridge University Press.

Holsti, O. R. and North, R. C. (1966), "Comparative data from content analysis: Perceptions of hostility and economic variables in the 1914 crisis in comparing nations", In *The use of quantitative data in cross-national research*, pp. 169-99, Yale University Press, New Haven.

Kapuscinski R. (1988), *Another Day of Life*, Penguin Books, London.

Keynes, J. M. (1971), *The Economic Consequences of the Peace*, The Royal Economic Society, Cambridge.

Koller, A., Goedhart, M., and Wessels, D. (2010). *Valuation: Measuring and Managing the Value of Companies*, John Wiley & Sons, New York.

Krippendorff, K. (2004), *Content Analysis: An Introduction to its methodology (2nd edition),* In Sage Publications, Thousand Oaks, CA.

Miall, H. (1992), *The Peacemakers: Peacefit Settlement of Disputes Since 1945,* Macmillan, London.

Tilly, C. H. (1975), *The formation of National states in Western Europ*e, Princeton University Press, New Jersey.

Woolridge, J. (2008), "Introductory Econometrics: A Modern Approach", In *South Western College*

Other Sources

BBC (2014a), "*Ukraine Crisis: Timeline*", retrieved on October 28, 2014 from http://www.bbc.com/news/world-middle-east-26248275.

BBC (2014b), "*Crimea Profile*", retrieved on October 22, 2014 from http://www.bbc.com/news/world-europe-18287223.

BBC (2014c), *"Russian import ban fuels food price rises"*, retrieved on November 2 2014 from http://www.bbc.com/news/world-europe-28849726.

Bryant, C. (2013), *"Germany's export surplus hits record high",* retrieved on December 8, 2014 from http://www.ft.com/cms/s/0/bf49b530-4852-11e3-8237-00144feabdc0.html#axzz3LL2fuf8t.

CFA Institute (2014), "*Multiple Regression and Issues in Regression Analysis*", retrieved on November 11th, 2014 from http://www.cfainstitute.org/learning/products/publications/inv/documents/quantitative_chapter9.pptx.

Central Intelligence Agency, (2014), "*The World Factbook*", retrieved on December 1, 2014 from https://www.cia.gov/library/publications/the-world-factbook/.

Council of the European Union, (2014), "*EU Sanctions Against Russia Over Ukraine Crisis*", retrieved on November 22, 2014 from http://europa.eu/newsroom/highlights/special-coverage/eu_sanctions/index_en.htm.

Holehouse, M. (2014), "*Russia Threatens to Hit British Companies in 'retaliation' for Sanctions*", retrieved on November 30, 2014 from http://www.telegraph.co.uk/news/worldnews/europe/russia/10989627/Russia-threatens-to-hit-British-companies-in-retaliation-for-sanctions.html.

International Committee of the Red Cross (2008), "*How is the Term 'Armed Conflict*" Defined in International Humanitarian Law.

Klussmann, U. and Schepp, M. (2014), "*Ticking Timebomb: Moscow Moves to Destabilize Eastern Ukraine*", retrieved on November 14, 2014 from http://www.spiegel.de/international /europe/how-moscow-is-moving-to-destablize-eastern-ukraine-a-959224.html.

Maclucas, N. (2014), *"Switzerland Extends Sanctions on Five Russian Banks",* retrieved on December 8, 2014 from http://www.wsj.com/articles/switzerland-extends-sanctions-on-five-unnamed-russian-banks-1409151869.

Mirzayan, G. (2013), "*A Divided Ukraine: Between Russia and the EU*", retrieved on November 12, 2014 from http://www.telegraph.co.uk/sponsored/rbth/society/10522793/divided-ukraine-russia-eu.html.

Ostroukh, A. (2014), *"Russian Auto Sales Decline Sharply",* retrieved on December 8, 2014 from http://www.wsj.com/articles/russian-auto-sales-decline-sharply-1410194442.

Russian Times (2014), "K*issinger Warns of West's 'Fatal Mistake' That May Lead to New Cold War*", retrieved on October 28, 2014 from http://rt.com/news/203795-kissinger-warns-cold-war/.

The Economist (2014), "*Battering On*", retrieved on October 28, 2014 from http://www.economist.com/news/europe/21613313-fighting-eastern-ukraine-intensifies-pro-russian-rebels-lose-ground-raising-fresh.

Wearden, G. (2014), "*Ukraine Crisis Sends Stock Markets Sliding; Russia's MICEX tumbles 11% - as it Happened*", retrieved on November 11, 2014 from http://www.theguardian .com/business/2014/mar/03/ukraine-crisis-hits-stock-markets-as-russia-hikes-interest-rates-business-live.

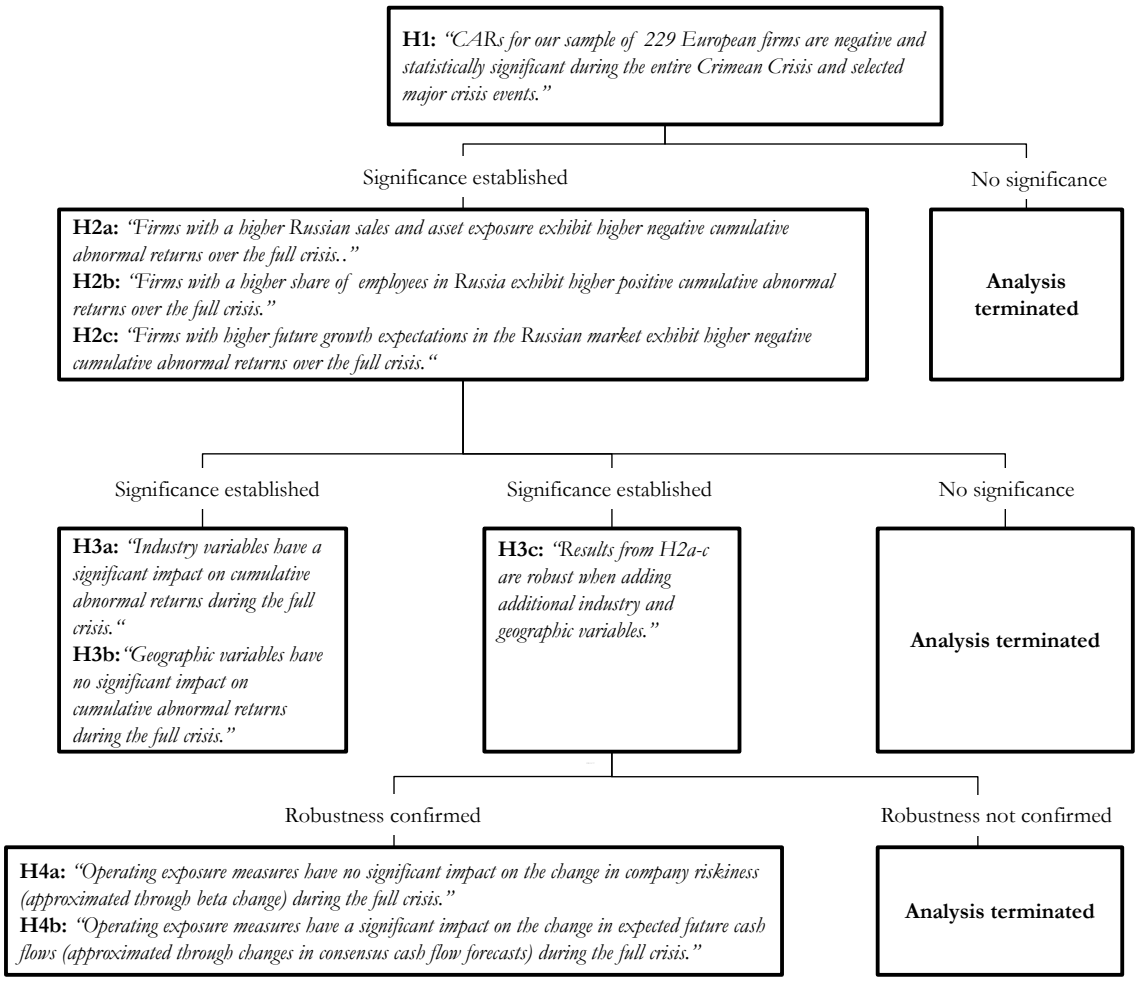
World Bank (2003), "*Breaking the conflict trap: Civil war and development policy*", *Technical report*, Washington, D.C. World Bank.

Yuhas, A. (2014), "*Ukraine Crisis: an Essential Guide to Everything That's Happened so Far*", retrieved on October 28, 2014 from http://www.theguardian.com/world/2014/apr/11/ ukraine-russia-crimea-sanctions-us-eu-guide-explainer.

Appendix

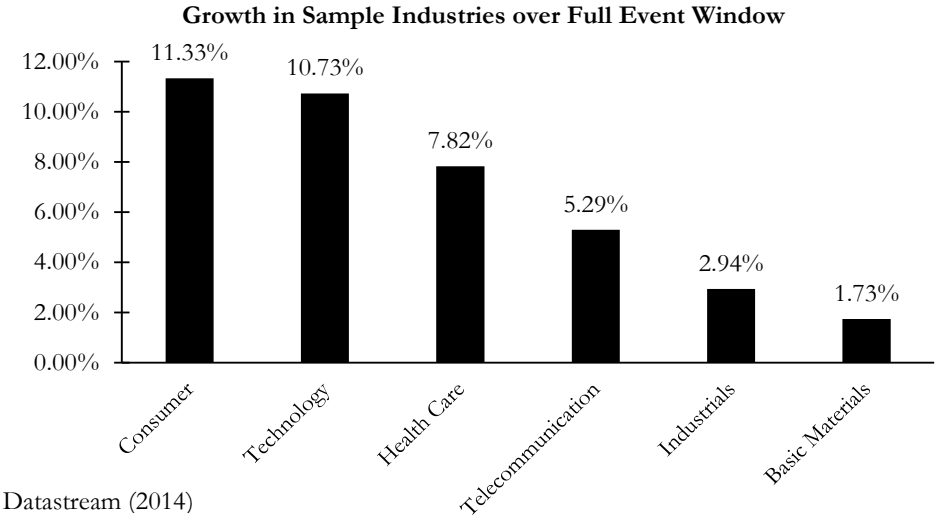
A. Figures

Figure 6 – Logical Sequence of Hypotheses Testing



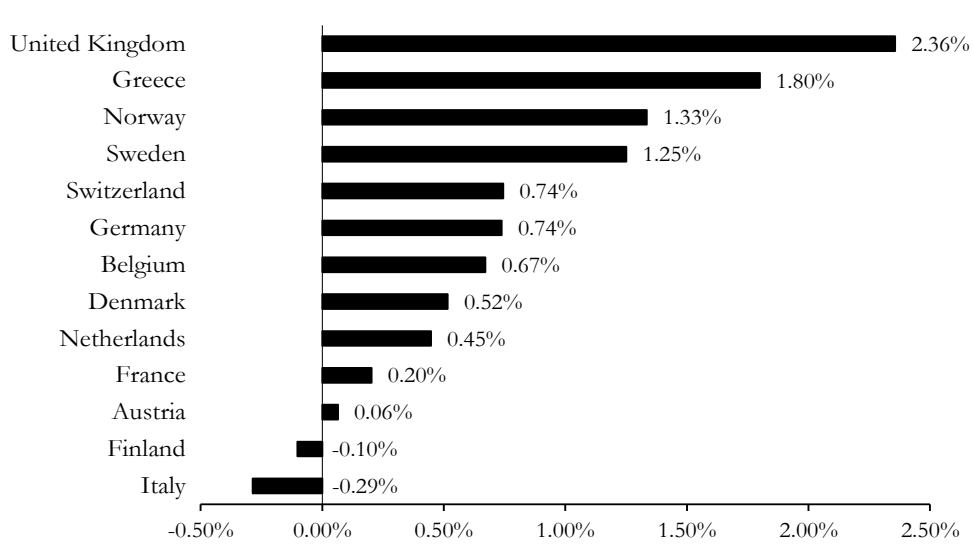
Description: The Figure outlines the logical sequence of testing the study's hypotheses. Accordingly, hypotheses *H1-H4* build upon each other, implying that before *H4* can be analyzed, hypotheses *H1*, *H2*, and *H3c* need to find support. As shown by the example of *H1*, if significance cannot be established, the analysis is terminated and the study ends here. Hence, also the outline of results follows this logical sequence. For instance: If significance is established for *H1*, the analysis progresses with *H2a-H2c*. If significance for these hypotheses is established, the analysis progresses to *H3a-H3c*, and so forth.

Figure 7 – Industry Growth of Sample Companies



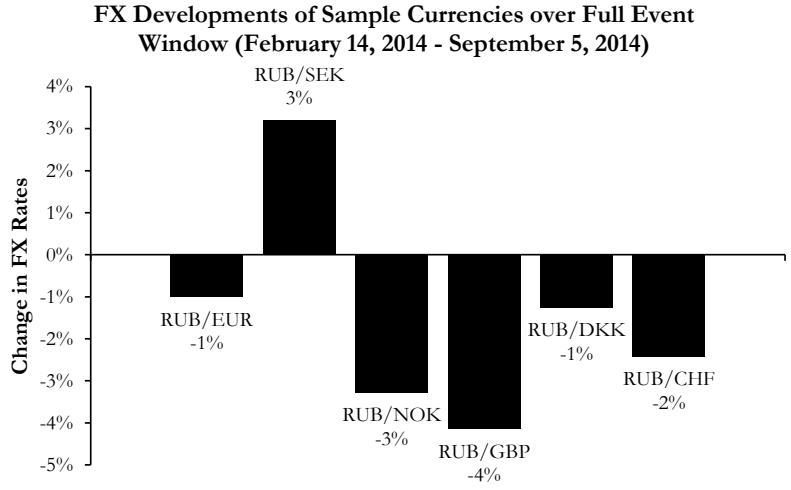
Source: Datastream (2014)

Figure 8 – GDP Growth of Sample Countries



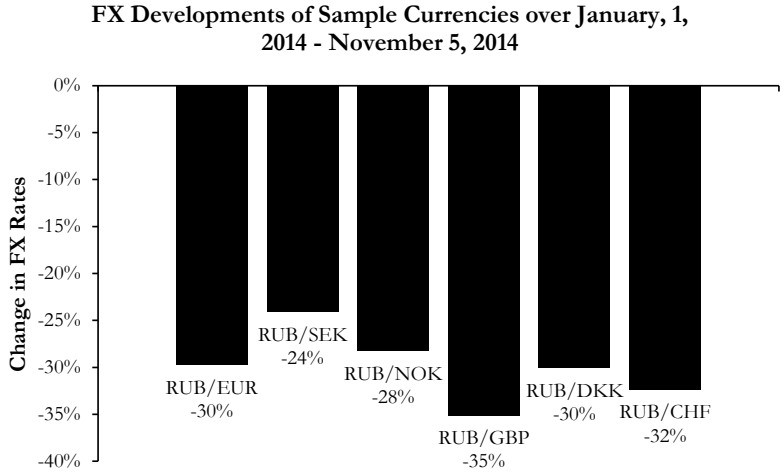
Source: OECD (2014)

Figure 9 – FX Development in Sample Currencies over Full Event Window



Source: Datastream (2014)

Figure 10 – FX Development in Sample Currencies over January – November, 2014



Source: Datastream (2014)

B. Tables

Table 16 – Complete Operating Exposure Measure Model

Dependent variable	***CAR Full*** (1)	***CAR Full*** (2)	***CAR Full*** (3)	***CAR Full*** (4)	***CAR Full*** (5)	***CAR Full*** (6)	***CAR Full*** (7)	***CAR Full*** (8)	***CAR Full*** (9)	***CAR Full*** (10)	***CAR Full*** (11)	***CAR Full*** (12)
Fraction_Sales_RU	**-0.722*** **	**-0.602***	**-1.882*** **	**-1.703*** **	**-1.701*** **	**-1.748*** **	**-1.783*** **	**-1.941*** **	**-2.011*** **	**-2.015*** **	**-2.013*** **	**-2.015*** **
	(0.236)	(0.313)	(0.687)	(0.672)	(0.668)	(0.658)	(0.660)	(0.711)	(0.634)	(0.606)	(0.608)	(0.598)
Fraction_Assets_RU		-0.165	**-0.921***	**-0.998***	**-0.989***	**-0.981***	**-0.979***	**-0.937***	**-0.953***	**-1.097*** **	**-1.103*** **	**-1.210*** **
		(0.387)	(0.495)	(0.511)	(0.516)	(0.517)	(0.538)	(0.542)	(0.544)	(0.539)	(0.530)	(0.588)
Fraction_Employees_RU			**1.936*** **	**1.922*** **	**1.913*** **	**1.933*** **	**2.026*** **	**2.077*** **	**2.127*** **	**2.253*** **	**2.260*** **	**2.286*** **
			(0.482)	(0.458)	(0.443)	(0.443)	(0.454)	(0.457)	(0.463)	(0.452)	(0.453)	(0.449)
Growth_Market				**-0.094*** **	**-0.094*** **	**-0.091*** **	**-0.099*** **	**-0.097*** **	**-0.094*** **	**-0.085*** **	**-0.085*** **	**-0.086*** **
				(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.040)	(0.039)	(0.040)
Leverage					-0.016	-0.002	-0.024	-0.015	-0.014	-0.024	-0.025	-0.039
					(0.123)	(0.127)	(0.136)	(0.133)	(0.131)	(0.128)	(0.039)	(0.125)
Tobin´s Q						0.015	0.016	0.015	0.016	0.011	0.012	0.009
						(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)
Total_Assets							**0.008*** **	**0.006*** **	**0.008*** **	**0.003*** **	**0.003*** **	**0.003*** **
							(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Industry_Growth								0.585	**1.486*** **	**1.508*** **	**1.510*** **	**1.480*** **
								(0.516)	(0.717)	(0.715)	(0.716)	(0.709)
Consumer_Intensity									**-0.114***	**-0.127***	**-0.127*** **	**-0.128*** **
									(0.062)	(0.063)	(0.063)	(0.062)
Germany										**-0.107*** **	**-0.108*** **	**-0.115*** **
										(0.041)	(0.041)	(0.041)
FX_Development											0.213	0.365
											(0.109)	(1.115)
GDP_Growth												3.073
												(2.913)
Constant	**-0.106*** **	**-0.105*** **	**-0.114*** **	**-0.074*** **	-0.068	**-0.103***	**-0.111***	**-0.139*** **	**-0.161*** **	**-0.132*** **	**-0.130*** **	**-0.130*** **
	(0.023)	(0.024)	(0.026)	(0.032)	(0.048)	(0.062)	(0.061)	(0.062)	(0.063)	(0.063)	(0.065)	(0.064)
No. of obs.	**229**	**229**	**229**	**229**	**229**	**229**	**229**	**229**	**229**	**229**	**229**	**229**
R-square	0.013	0.014	0.059	0.082	0.082	0.087	0.100	0.105	0.121	0.141	0.141	0.145
R-square adjusted	0.009	0.005	0.049	0.066	0.062	0.062	0.071	0.072	0.085	0.101	0.097	0.098

Notes: CAR_Full is the cumulative abnormal return for European sample firms over the full crisis period (February 14, 2014 to September 05, 2014); Fraction_Sales_RU is the ratio of sales in Russia to total sales for the sample of European firms; Fraction_Assets_RU is the ratio of assets in Russia to total assets; Fraction_Employees_RU is the ratio of employees in Russia to total employees; Growth_Market is a dummy variable denoting 1 if Russia is recognized as a growth market in a firm's annual report and 0 if Russia is not a target market; Leverage is the ratio of a firm's net debt to total capital; Total_Assets refers to the book value of sample firms´ total assets; Tobin's Q is the ratio of total capital to the book value of total assets; Germany is a country dummy taking the value 1 if a firm is headquartered in Germany and 0 if a firm is headquartered in any other country; Customer_Intensity is a dummy variable taking 1 if a company can be classified as B2C and 0 if a company can be classified as B2B; FX_Development refers to a company's corresponding currency development (e.g., RUB/EUR) during the Crisis - The Ruble development with regards to the company's home currency (e.g., RUB/EUR of - 3%) implies that RUB depreciates by - 3% making EU products in Russia more expensive; Industry_Growth and GDP_Growth refer to growth within a copmany's respective industry and country of headquarter. In all cases abnormal returns are estimated using the market model. Robust standard errors for each coefficient are provided in parantheses. *,** and *** indicate significance at the 10%, 5% and 1% level. Regressions are run with heteroskedasticity-consistent standard errors.

Table 17 – Correlation All Explanatory Variables for Full CAR Sample

Correlation betwen Explanatory Variables												
Full Sample- Full_Crisis_Window												
	Fraction_ Sales_RU	Fraction_ Employees_RU	Fraction_ Assets_RU	Growth_ Market	Industry_ Growth	Consumer_ Intensity	GDP_ Growth	FX_ Development	Germany	Leverage	Tobin´s Q	Total_ Assets
Fraction_Sales_RU	1.000											
Fraction_Employees_RU	0.794	1.000										
Fraction_Assets_RU	0.793	0.742	1.000									
Growth_Market	0.112	0.074	0.059	1.000								
Industry Growth	0.159	0.057	0.075	0.024	1.000							
Consumer_Intensity	0.070	0.018	0.019	0.051	0.682	1.000						
GDP_Growth	0.147	0.111	0.179	0.029	0.083	0.055	1.000					
FX_Development	-0.060	-0.076	-0.032	0.011	-0.019	0.007	-0.135	1.000				
Germany	-0.003	0.036	-0.039	0.124	-0.042	-0.071	0.087	0.024	1.000			
Leverage	-0.02	-0.058	0.020	-0.126	-0.056	-0.021	0.100	0.054	-0.020	1.000		
Tobin´s Q	0.05	0.037	-0.001	0.000	0.106	0.074	0.146	-0.203	-0.134	-0.394	1.000	
Total_Assets	-0.07	-0.116	-0.068	0.072	0.216	0.283	0.033	-0.029	0.159	0.153	-0.140	1.00

Notes: Fraction_Sales_RU is the ratio of sales in Russia to total sales for the sample of European firms; Fraction_Assets_RU is the ratio of assets in Russia to total assets; Fraction_Employees_RU is the ratio of employees in Russia to total employees; Growth_Market is a dummy variable denoting 1 if Russia is recognized as a growth market in a firm´s annual report and 0 if Russia is not a target market; Leverage is the ratio of a firm's net debt to total capital; Total_Assets refers to the book value of sample firms´ total assets; Tobin's Q is the ratio of total capital to the book value of total assets; Germany is a country dummy taking the value 1 if a firm is headquartered in Germany and 0 if a firm is headquartered in any other country; Conumer_Intensity denotes a dummy variable taking 1 if a company can be classified as B2C and 0 if a company can be classified as B2B; FX_Development refers to a company's corresponding currency development (e.g., RUB/EUR) during the Crisis - The Ruble development with regards to the company's home currency (e.g., RUB/EUR of - 3%) implies that RUB depreciates by - 3% making EU products in Russia more expensive; Industry_Growth and GDP_Growth refer to growth within a company's respective industry and country of headquarter.

Table 18 – Overview of Economic Sanctions

Overview of Main Economic Sanctions Imposed by EU and Russia

EU Sanctions	Russian Sanctions
- **Restrictions on access to EU capital** for five major Russian state owned banks, as well as three major Russian defence companies and three major energy companies by prohibiting… … trade in new bonds, equity or similar financial … the granting of loans - **Reinforcement of an export ban** for dual-use goods and technology for military end users (arms embargo) - **Reduction of Russian access to certain services** necessary for deep water oil exploration and production - **Asset freeze** and **visa bans** for a total of 119 persons and 23 entities including key Russian personnel and oligarchs	- **Full embargo on food imports** from the EU/US/Other Western countries in response to sanctions over Ukraine (Norway is also affected) … **banned products** include, among others, vegetables, fruit, meat, fish, milk and other dairy imports
Source: Council of the European Union (2014)	**Source:** BBC (2014c)

Notes: Russia additionally threatened the EU with an embargo on clothes, used cars and other consumer products at the beginning of September, 2014. (BBC 2014c)

Description: The table provides an overview over the main sanctions exercised against each other by the EU and Russia. The left colum outlines EU sanctions imposed on Russia, the right column shows Russian sanctions imposed on, among others, the EU. This shall contribute to a better understanding of the dynamics of the Crimean Crisis.

Table 19 – Russia's Top 10 Trade Partners

Russia´s Top 10 Trade Partners for Imports and Exports in 2013

	Russian Exports				*Russian Imports*		
#	*Country*	*Value (in USDm)*	*% of Russian Exports*	*#*	*Country*	*Value (in USDm)*	*% of Russian Imports*
1	Netherlands	70,126	9.20%	**1**	China	48,081	15.00%
2	China	38,105	8.10%	**2**	Germany	46,524	14.00%
3	Germany	30,521	6.50%	**3**	Ukraine	17,733	5.50%
4	Ukraine	26,648	5.70%	**4**	Belarus	15,025	4.60%
5	Belarus	25,461	5.40%	**5**	Japan	14,324	4.40%
6	Italy	23,294	5.00%	**6**	USA	13,346	4.10%
7	Poland	21,030	4.50%	**7**	Italy	12,639	3.90%
8	Japan	17,355	3.70%	**8**	France	12,240	3.80%
9	Kazakhstan	15,974	3.40%	**9**	South Korea	11,160	3.40%
10	Turkey	15,023	3.20%	**10**	Poland	9,069	2.80%

Source: Central Intelligence Agency (2014)

Description: The table provides an overview of Goods imported and exported by the Russian Federation. More precisely, it is an outline of the value of goods imported/exported by Russia and the percentage amount of total imports and Exports. Column 1 "Russian Exports" refers to goods (e.g., food,oil and gas, etc.)sold by Russia to other countries such as the Netherlands. Referring to column 2, "Russian Imports", figures illustrated the value and fraction of total goods (e.g. food, cars, etc.) bought by Russia from other countries such as China or Germany. The numbers 1-10 in each column indicate a ranking of Russia´s main trade partners along the dimensions of import and export.

Table 20 – Key Facts about Ukraine and Russia

Snapshort: Ukraine versus Russia

	Ukraine	Russian Federation
Population 2013 (in million)	44.3	143.8
GDP 2013 PPP* (in bn. $)	373.1	3,559
GDP 2013 PPP* per capita (in $)	8,240	24,764
Area (square km)	603,628	17,098,242
Currency	Ukrainian Hryvnia	Russian Ruble
President (Current)	Petro Poroshenko	Vladimir Putin
Ethnic Groups 2013	77.8% Ukrainians	81% Russian
	17.3% Russians	1.4% Ukrainian
	4.9% Others	17.6% Others

Sources: BBC (2014a); Datastream (2014).

*PPP refers to Purchasing Power Parity

Description: The table provides a brief overview of Ukraine and Russia in order to highlight their differences in size and economic power. A closer look at ethnic groups gives the reader the interesting fact that with 17.3%, a large fraction of the Ukrainian population is actually Russia which is a key factor within the Crimean Crisis.

Table 21 – Correlation Operating Exposure Measures for Valuation Theory Sample

Correlation betwen Operating Exposure Measure Variables

165 Sample Companies over the Full Crisis Period

	Fraction_ Sales_RU	Fraction_ Employees_RU	Fraction_ Assets_RU	Growth_ Market
Fraction_Sales_RU	1.000			
Fraction_Employees_RU	0.760	1.000		
Fraction_Assets_RU	0.823	0.620	1.000	
Growth_Market	0.160	0.083	0.102	1.000

Notes: Fraction_Sales_RU is the ratio of sales in Russia to total sales for the sample of European firms; Fraction_Assets_RU is the ratio of assets in Russia to total assets; Fraction_Employees_RU is the ratio of employees in Russia to total employees; Growth_Market is a dummy variable denoting 1 if Russia is recognized as a growth market in a firm´s annual report and 0 if Russia is not a target market.

Table 22 – Comprehensive Overview of Total Sample

Overview of Key Sample Characteristics

General Company Information		Industry Specifications		Russia Exposure				Additional Company Characteristics		
Company Name	***HQ***	***Industry Name***	***B2C/B2B***	***%Sales***	***%Assets***	***%Employees***	***Growth***	***Total Assets (m€)***	***Market Cap. (m€)***	***CAR_Full_Crisis***
ABB LTD	Switzerland	Industrials	B2B	2.41%	2.19%	1.88%	No	34,753	44,348	-14.71%
ACTELION	Switzerland	Health Care	B2C	3.45%	2.03%	1.42%	Yes	2,458	7,395	-26.35%
ADECCO	Switzerland	Industrials	B2B	2.25%	2.16%	2.52%	Yes	9,337	10,903	-24.94%
ADIDAS	Germany	Consumer	B2C	7.22%	7.65%	3.12%	Yes	11,113	19,372	-49.10%
AERCAP HOLDINGS N V	Netherlands	Industrials	B2B	4.96%	3.53%	1.25%	Yes	6,792	3,165	-97.72%
AFG ARBONIA-FORSTER	Switzerland	Industrials	B2B	3.16%	3.04%	2.13%	Yes	828	468	-37.73%
AGFA-GEVAERT	Belgium	Industrials	B2B	1.22%	1.50%	2.42%	Yes	2,373	302	-23.41%
AIR LIQUIDE	France	Basic Materials	B2B	2.69%	2.72%	2.81%	No	24,793	32,145	16.99%
AIRBUS GROUP	Netherlands	Industrials	B2B	2.14%	2.04%	2.31%	No	89,471	43,690	-33.84%
AKKA TECHNOLOGIES	France	Industrials	B2B	1.11%	1.06%	1.02%	No	620	356	15.49%
AKTKT.SCHOUW & CO.	Denmark	Industrials	B2B	3.74%	3.53%	3.12%	No	1,290	760	-17.05%
AKZO NOBEL	Netherlands	Basic Materials	B2B	3.71%	3.04%	2.94%	Yes	14,992	13,511	-26.65%
ALFA LAVAL	Sweden	Industrials	B2B	3.39%	1.17%	2.14%	Yes	3,789	7,820	-17.07%
AMER SPORTS	Finland	Consumer	B2C	3.00%	2.28%	2.52%	Yes	1,933	1,792	-12.52%
AMSTERDAM COMMODITIES	Netherlands	Consumer	B2B	3.57%	2.41%	1.27%	No	277	389	-2.83%
ANHEUSER-BUSCH INBEV	Belgium	Consumer	B2C	2.63%	3.69%	3.23%	No	102,274	124,222	20.93%
ARCADIS	Netherlands	Industrials	B2B	2.08%	2.10%	2.04%	No	1,643	1,917	-47.64%
ARCELORMITTAL	Netherlands	Basic Materials	B2B	2.04%	2.00%	1.09%	No	75,253	21,600	-32.44%
ASSA ABLOY	Sweden	Industrials	B2B	2.54%	2.03%	2.04%	Yes	7,241	13,503	-9.27%
ASSYSTEM	France	Industrials	B2B	3.66%	2.26%	2.38%	No	610	386	-30.57%
ASTRAZENECA	United Kingdom	Health Care	B2C	3.80%	2.59%	4.99%	Yes	39,706	54,011	-17.53%
ATLAS COPCO	Sweden	Industrials	B2B	2.66%	1.07%	1.47%	No	9,822	16,911	21.20%
ATOS	France	Technology	B2B	3.31%	3.17%	1.31%	No	6,866	6,375	-37.98%
AURIGA INDUSTRIES	Denmark	Basic Materials	B2B	1.03%	1.40%	3.00%	No	825	448	68.04%
AUTONEUM HOLDING	Switzerland	Consumer	B2B	3.92%	2.99%	2.02%	Yes	801	521	-55.99%
AVEVA GROUP	United Kingdom	Technology	B2B	4.31%	4.37%	5.94%	No	419	1,661	29.51%
AXEL SPRINGER	Germany	Consumer	B2C	2.75%	2.17%	1.94%	No	4,733	4,630	-38.78%
BARCO NEW	Belgium	Industrials	B2B	1.33%	1.27%	1.98%	Yes	985	718	4.30%
BARRY CALLEBAUT	Switzerland	Consumer	B2C	3.24%	2.47%	4.70%	No	3,622	5,007	-18.97%
BASF	Germany	Basic Materials	B2B	2.27%	1.73%	1.07%	Yes	63,390	71,329	-19.37%
BAUER	Germany	Industrials	B2B	3.95%	2.59%	4.56%	No	1,559	319	-41.09%
BAYER	Germany	Basic Materials	B2C	2.53%	2.74%	2.53%	Yes	49,721	84,431	-19.49%
BEIERSDORF	Germany	Consumer	B2C	3.33%	2.88%	8.54%	Yes	5,665	18,588	-23.67%

Notes: Russian Exposure (relating to Sales, Assets, Employees and Growth) is measured at time t; Total Assets, Leverage and Market Cap measured at December, 31st 2013.

Overview of Key Sample Characteristics

General Company Information		Industry Specifications		Russia Exposure				Additional Company Characteristics		
Company Name	*HQ*	*Industry Name*	*B2C/B2B*	*%Sales*	*%Assets*	*%Employees*	*Growth*	*Total Assets (m€)*	*Market Cap. (m€)*	*CAR_Full_Crisis*
BEKAERT (D)	Belgium	Industrials	B2B	1.20%	1.19%	1.91%	Yes	3,303	1,545	22.88%
BELIMO HOLDING	Switzerland	Industrials	B2B	5.91%	3.64%	19.99%	No	301	1,234	-9.22%
BILFINGER BERGER	Germany	Industrials	B2B	5.71%	5.66%	1.48%	Yes	6,345	3,752	-60.72%
BIOMERIEUX	France	Health Care	B2C	1.18%	1.46%	1.45%	No	2,163	3,009	-1.96%
BMW	Germany	Consumer	B2C	2.34%	1.68%	1.93%	No	136,748	51,471	0.37%
BOBST GROUP	Switzerland	Industrials	B2B	2.07%	2.16%	1.96%	No	1,230	440	19.34%
BOIRON	France	Health Care	B2C	9.08%	5.50%	4.14%	No	627	996	-17.11%
BONDUELLE	France	Consumer	B2C	8.02%	8.03%	15.52%	No	1,674	616	-1.41%
BONGRAIN	France	Consumer	B2C	2.52%	2.74%	2.76%	No	3,296	790	-18.05%
BOSKALIS WESTMINSTER	Netherlands	Industrials	B2B	2.37%	1.87%	2.69%	No	5,726	4,619	14.98%
BRENNTAG	Germany	Basic Materials	B2B	3.17%	2.12%	2.21%	No	5,577	6,887	-15.43%
BRITISH AMERICAN TOBACCO	United Kingdom	Consumer	B2C	3.31%	2.77%	2.38%	No	32,011	73,436	33.74%
BUCHER INDUSTRIES	Switzerland	Industrials	B2B	2.60%	2.37%	2.71%	No	1,947	2,166	-17.13%
BUREAU VERITAS INTL.	France	Industrials	B2B	1.24%	2.87%	1.23%	Yes	3,595	9,393	14.37%
BUZZI UNICEM	Italy	Industrials	B2B	9.70%	7.50%	8.05%	No	5,265	2,168	-51.69%
CARLSBERG	Denmark	Consumer	B2C	20.33%	10.70%	21.97%	No	20,101	9,559	2.90%
CFE	Belgium	Industrials	B2B	3.04%	3.02%	2.51%	Yes	4,123	848	-37.73%
CHR HANSEN HOLDING	Denmark	Health Care	B2B	3.58%	1.51%	6.57%	No	1,358	3,883	-7.48%
CHRISTIAN DIOR	France	Consumer	B2C	5.31%	1.35%	1.61%	No	54,148	24,960	7.52%
CLARIANT	Switzerland	Basic Materials	B2B	2.41%	2.18%	2.35%	No	6,470	4,418	-17.97%
COLTENE N	Switzerland	Health Care	B2B	3.56%	0.54%	3.08%	No	118	158	15.56%
CONTINENTAL	Germany	Consumer	B2C	2.51%	1.26%	1.94%	Yes	25,892	31,921	-38.53%
CONZZETA HOLDING	Switzerland	Industrials	B2B	1.06%	0.31%	2.99%	No	1,091	687	21.01%
CRAMO	Finland	Industrials	B2B	2.83%	1.99%	2.35%	Yes	1,060	658	-20.21%
DAIMLER	Germany	Consumer	B2C	2.23%	2.36%	1.44%	Yes	166,689	67,467	-18.05%
DAVIDE CAMPARI MILANO	Italy	Consumer	B2C	5.12%	2.08%	13.24%	No	3,290	3,531	12.73%
DE LA RUE	United Kingdom	Industrials	B2B	2.37%	1.22%	2.45%	No	479	1,046	32.39%
DECEUNINCK ECH	Belgium	Industrials	B2B	7.98%	7.17%	9.69%	No	406	184	-83.21%
D'IETEREN	Belgium	Consumer	B2B	1.25%	1.23%	1.02%	No	3,513	2,002	-15.64%
DMG MORI SEIKI	Germany	Industrials	B2B	2.89%	2.12%	1.84%	Yes	1,962	1,828	-49.65%
DUERR	Germany	Industrials	B2B	2.73%	2.96%	2.54%	No	1,968	2,235	-31.89%
DUFRY	Switzerland	Consumer	B2C	2.69%	2.71%	2.80%	No	3,332	3,949	-3.26%
EAST ASIATIC	Denmark	Consumer	B2B	1.18%	1.68%	2.15%	No	709	132	17.33%

Overview of Key Sample Characteristics

General Company Information		Industry Specifications		Russia Exposure				Additional Company Characteristics		
Company Name	*HQ*	*Industry Name*	*B2C/B2B*	*%Sales*	*%Assets*	*%Employees*	*Growth*	*Total Assets (m€)*	*Market Cap. (m€)*	*CAR_Full_Crisis*
ELECTROLUX	Sweden	Consumer	B2C	1.50%	2.16%	2.25%	No	8,092	5,726	60.17%
ELEKTA	Sweden	Health Care	B2B	4.63%	9.94%	1.96%	Yes	1,832	4,096	-9.73%
EMS-CHEMIE 'N'	Switzerland	Basic Materials	B2B	1.40%	1.67%	5.69%	No	1,408	6,050	13.05%
ERICSSON	Sweden	Technology	B2B	2.49%	2.11%	5.83%	No	29,387	2,203	24.13%
ESSILOR INTL.	France	Health Care	B2B	1.78%	1.29%	2.54%	No	7,465	16,565	18.24%
EVONIK INDUSTRIES	Germany	Basic Materials	B2B	2.48%	2.84%	1.05%	Yes	15,062	13,838	-11.09%
EXEL INDUSTRIES	France	Industrials	B2B	3.52%	2.41%	1.20%	Yes	589	371	-86.10%
FAIVELEY TRANSPORT	France	Industrials	B2B	1.40%	1.12%	1.27%	Yes	1,429	766	-12.38%
FIERA MILANO	Italy	Industrials	B2B	3.32%	3.46%	2.36%	Yes	282	284	-103.46%
FISKARS	Finland	Consumer	B2C	3.91%	2.95%	7.34%	Yes	1,008	1,601	-31.51%
FLSMIDTH & CO.'B'	Denmark	Industrials	B2B	4.90%	2.90%	2.60%	Yes	3,511	2,111	14.93%
FORBO	Switzerland	Industrials	B2B	3.08%	1.77%	6.80%	Yes	896	1,399	10.26%
FUCHS PETROLUB	Germany	Basic Materials	B2B	2.69%	2.43%	2.39%	Yes	1,137	2,201	-17.92%
GEA GROUP	Germany	Industrials	B2B	3.96%	1.19%	6.71%	No	6,079	6,672	-18.95%
GENUS	United Kingdom	Health Care	B2C	2.65%	1.24%	3.80%	Yes	709	949	-6.67%
GETINGE	Sweden	Health Care	B2B	1.94%	2.00%	1.99%	No	4,960	5,528	-17.92%
GFK	Germany	Consumer	B2B	2.25%	3.94%	2.35%	No	1,658	1,454	-29.21%
GIVAUDAN 'N'	Switzerland	Basic Materials	B2B	1.12%	1.05%	1.23%	Yes	4,924	9,599	5.90%
GLAXOSMITHKLINE	United Kingdom	Health Care	B2C	2.88%	2.39%	2.09%	No	48,079	94,032	-10.76%
GRONTMIJ	Netherlands	Industrials	B2B	3.69%	2.63%	3.17%	No	580	230	-20.73%
H LUNDBECK	Denmark	Health Care	B2C	2.30%	1.69%	2.36%	No	3,131	3,603	-40.55%
HAULOTTE GROUP	France	Industrials	B2B	7.68%	4.66%	8.73%	No	291	341	-35.77%
HAYS	United Kingdom	Industrials	B2B	2.15%	2.16%	2.93%	Yes	1,022	2,194	-30.83%
HEIDELB.DRUCKMASCHINEN	Germany	Industrials	B2B	3.92%	2.40%	2.22%	No	2,302	607	-76.29%
HEIDELBERGCEMENT	Germany	Industrials	B2B	2.22%	2.13%	5.85%	Yes	26,457	10,354	-0.18%
HEINEKEN	Netherlands	Consumer	B2C	3.33%	1.60%	2.30%	No	32,829	28,270	39.74%
HENKEL	Germany	Consumer	B2B	6.16%	1.94%	12.60%	Yes	18,738	19,511	-23.08%
HENNES & MAURITZ	Sweden	Consumer	B2C	1.70%	2.07%	1.35%	Yes	7,266	48,885	9.32%
HOCHTIEF	Germany	Industrials	B2B	1.55%	1.20%	1.15%	No	14,632	4,796	2.72%
HOLCIM	Switzerland	Industrials	B2B	1.60%	2.56%	2.42%	No	30,642	17,815	22.62%
HOMAG GROUP	Germany	Industrials	B2B	1.99%	1.47%	1.27%	No	535	297	-32.64%
HUHTAMAKI	Finland	Industrials	B2B	3.35%	2.68%	3.48%	No	2,104	2,007	38.63%
HUSQVARNA	Sweden	Consumer	B2C	3.30%	3.88%	1.03%	No	2,897	552	-49.36%

Overview of Key Sample Characteristics

General Company Information		Industry Specifications		Russia Exposure				Additional Company Characteristics		
Company Name	*HQ*	*Industry Name*	*B2C/B2B*	*%Sales*	*%Assets*	*%Employees*	*Growth*	*Total Assets (m€)*	*Market Cap. (m€)*	*CAR_Full_Crisis*
IMA INDUA.MACCHINE	Italy	Industrials	B2B	2.97%	1.26%	1.67%	No	732	1,031	-39.93%
IMERYS	France	Basic Materials	B2B	1.63%	1.20%	2.28%	No	4,838	4,761	7.57%
IMPERIAL TOBACCO GP.	United Kingdom	Consumer	B2C	5.67%	2.32%	6.36%	Yes	33,972	27,085	18.57%
INCHCAPE	United Kingdom	Consumer	B2C	5.14%	6.77%	2.31%	Yes	4,041	3,406	-49.88%
INGENICO	France	Technology	B2B	2.42%	0.80%	2.57%	Yes	1,957	3,093	22.20%
INTERTEK GROUP	United Kingdom	Industrials	B2B	1.29%	1.01%	1.81%	No	2,286	6,105	-23.04%
INTRALOT INTGRTD.SYSV.	Greece	Consumer	B2C	2.25%	1.40%	3.69%	No	1,120	292	-8.59%
IPSEN	France	Health Care	B2C	7.28%	4.88%	6.15%	Yes	1,363	2,894	-4.73%
ITE GROUP	United Kingdom	Consumer	B2B	59.75%	36.54%	41.93%	Yes	295	920	-43.77%
JOHNSON MATTHEY	United Kingdom	Basic Materials	B2B	3.86%	3.51%	2.51%	No	4,222	8,078	-45.69%
JUNGHEINRICH PREF.	Germany	Industrials	B2B	3.94%	2.91%	2.72%	No	2,664	754	-27.39%
KESKO 'A'	Finland	Consumer	B2C	6.84%	3.84%	12.92%	Yes	4,359	851	-48.15%
KINGFISHER	United Kingdom	Consumer	B2B	4.08%	2.85%	3.99%	Yes	11,875	10,984	17.49%
KONE	Finland	Industrials	B2B	1.51%	4.55%	3.16%	No	5,124	14,637	-20.49%
KONTRON	Germany	Industrials	B2B	13.38%	9.23%	36.49%	Yes	424	290	6.90%
KRONES	Germany	Industrials	B2B	2.11%	1.95%	2.28%	Yes	2,221	1,978	17.27%
KSB PREF.	Germany	Industrials	B2B	2.50%	1.91%	1.68%	Yes	2,112	377	-21.56%
LANXESS	Germany	Basic Materials	B2B	1.88%	2.30%	1.33%	No	6,557	4,043	-39.55%
LECTRA	France	Technology	B2C	3.77%	2.64%	3.21%	Yes	179	242	-64.27%
LEM 'R'	Switzerland	Industrials	B2B	3.88%	2.60%	8.44%	No	111	649	-9.51%
LEONI	Germany	Industrials	B2B	3.32%	2.91%	1.30%	No	2,343	1,776	-15.80%
LINDAB INTERNATIONAL	Sweden	Industrials	B2B	5.74%	17.19%	7.00%	No	720	564	-1.88%
L'OCCITANE INTL.	France	Consumer	B2C	5.33%	2.63%	4.71%	Yes	980	2,281	20.46%
L'OREAL	France	Consumer	B2C	5.10%	3.10%	2.48%	Yes	30,622	76,785	-52.49%
LOW & BONAR	United Kingdom	Industrials	B2B	1.79%	1.34%	2.33%	Yes	506	281	-0.57%
MAN	Germany	Industrials	B2B	5.00%	3.90%	9.72%	No	21,986	12,567	13.26%
MANITOU	France	Industrials	B2B	3.68%	2.78%	3.08%	Yes	815	546	-60.23%
MANUTAN INTL.	France	Industrials	B2C	3.39%	2.31%	1.04%	Yes	487	348	-41.10%
MAYR-MELNHOF KARTON	Austria	Industrials	B2B	3.48%	2.52%	10.30%	Yes	1,686	1,800	8.45%
MERSEN (EX LCL)	France	Industrials	B2B	2.24%	1.58%	2.37%	No	905	524	-15.76%
METRO	Germany	Consumer	B2C	8.85%	8.85%	8.83%	Yes	27,974	11,444	-11.75%
METSA BOARD 'B'	Finland	Basic Materials	B2B	4.10%	1.75%	3.43%	No	2,087	920	7.14%
METSO	Finland	Industrials	B2B	5.06%	1.71%	2.06%	Yes	3,561	4,664	14.67%

Overview of Key Sample Characteristics

General Company Information		Industry Specifications		Russia Exposure				Additional Company Characteristics		
Company Name	***HQ***	***Industry Name***	***B2C/B2B***	***%Sales***	***%Assets***	***%Employees***	***Growth***	***Total Assets (m€)***	***Market Cap. (m€)***	***CAR_Full_Crisis***
MICHELIN	France	Consumer	B2C	1.95%	1.08%	1.77%	No	19,628	14,320	20.18%
MONDI	United Kingdom	Basic Materials	B2B	9.39%	35.99%	26.59%	No	6,219	4,617	-23.33%
NATUREX	France	Consumer	B2C	2.08%	1.60%	1.00%	No	509	457	-5.45%
NCC 'B'	Sweden	Industrials	B2B	1.09%	5.81%	1.94%	No	4,355	1,915	-1.72%
NESTLE 'R'	Switzerland	Consumer	B2C	2.52%	1.24%	3.60%	No	96,447	171,826	-23.33%
NEXANS	France	Industrials	B2B	1.86%	0.91%	1.93%	No	5,341	1,548	20.78%
NIBE INDUSTRIER 'B'	Sweden	Industrials	B2B	2.11%	2.66%	1.77%	No	1,454	1,592	-20.90%
NOBEL BIOCARE HOLDING	Switzerland	Health Care	B2B	3.19%	2.45%	1.10%	No	597	1,404	15.72%
NOKIA	Finland	Technology	B2B	3.09%	2.37%	1.00%	Yes	24,301	21,796	1.92%
NORBERT DENTRESSANGLE	France	Industrials	B2B	3.95%	7.09%	2.00%	Yes	2,648	920	-29.17%
NORMA GROUP	Germany	Consumer	B2C	2.91%	1.54%	1.16%	Yes	816	1,154	-47.25%
NOVARTIS 'R'	Switzerland	Health Care	B2C	1.79%	0.94%	1.17%	Yes	86,622	157,222	10.21%
NUTRECO	Netherlands	Consumer	B2C	1.92%	2.49%	2.32%	No	2,598	2,536	9.36%
ORIFLAME COSMETICS SDR	Sweden	Consumer	B2C	17.28%	16.02%	17.25%	No	740	1,208	-1.48%
ORION 'A'	Finland	Health Care	B2B	3.05%	1.76%	4.55%	No	978	855	12.54%
OSRAM LICHT	Germany	Consumer	B2C	3.90%	2.23%	2.67%	No	4,028	4,291	-89.27%
OUTOKUMPU 'A'	Finland	Basic Materials	B2B	2.13%	1.75%	2.52%	No	8,799	845	88.87%
PER AARSLEFF	Denmark	Industrials	B2B	2.92%	1.96%	2.46%	Yes	608	250	-30.53%
PEUGEOT	France	Consumer	B2C	3.34%	2.14%	1.05%	Yes	59,131	3,349	24.73%
PHILIPS ELTN.KONINKLIJKE	Netherlands	Industrials	B2C	2.28%	1.70%	1.04%	No	24,884	24,989	-20.30%
PIRELLI	Italy	Consumer	B2C	7.15%	7.06%	8.94%	Yes	7,150	5,985	-39.55%
PLASTIC OMNIUM	France	Consumer	B2B	2.45%	1.83%	1.68%	Yes	3,428	3,146	-0.93%
PRYSMIAN	Italy	Industrials	B2B	2.77%	1.90%	1.27%	Yes	5,568	4,015	-29.01%
PSI	Germany	Technology	B2B	5.28%	7.81%	3.08%	Yes	172	209	-21.35%
R STAHL	Germany	Industrials	B2B	1.74%	1.39%	4.02%	Yes	239	242	-2.15%
RECKITT BENCKISER GROUP	United Kingdom	Consumer	B2C	12.50%	14.16%	20.49%	Yes	18,151	41,466	1.17%
RENAULT	France	Consumer	B2C	8.00%	5.60%	4.93%	Yes	74,596	17,285	-29.39%
RENISHAW	United Kingdom	Industrials	B2B	2.97%	2.26%	2.98%	No	452	1,702	-17.59%
RENOLD	United Kingdom	Industrials	B2B	2.91%	1.20%	1.41%	No	190	134	-83.64%
RESILUX	Belgium	Industrials	B2B	13.56%	8.97%	16.55%	No	179	185	-35.66%
REXAM	United Kingdom	Industrials	B2B	6.14%	5.97%	8.75%	No	5,852	5,050	-7.60%
REXEL	France	Industrials	B2B	3.26%	4.46%	1.57%	No	10,379	5,404	-24.32%
RHI	Austria	Industrials	B2B	3.38%	2.97%	4.88%	No	1,603	898	-7.02%

Overview of Key Sample Characteristics

General Company Information		Industry Specifications		Russia Exposure				Additional Company Characteristics		
Company Name	*HQ*	*Industry Name*	*B2C/B2B*	*%Sales*	*%Assets*	*%Employees*	*Growth*	*Total Assets (m€)*	*Market Cap. (m€)*	*CAR_Full_Crisis*
ROCHE HOLDING	Switzerland	Health Care	B2C	1.40%	3.26%	1.12%	No	46,886	142,859	-7.68%
ROCKWOOL 'B'	Denmark	Industrials	B2C	4.01%	5.61%	8.60%	Yes	1,821	1,382	-36.90%
ROSENBAUER INTL.	Austria	Industrials	B2B	2.48%	4.12%	2.47%	Yes	413	403	4.59%
ROYAL IMTECH	Netherlands	Industrials	B2C	3.66%	2.95%	1.06%	No	3,262	962	-149.80%
SABMILLER	United Kingdom	Consumer	B2C	3.19%	1.76%	2.25%	No	44,465	59,828	42.02%
SAFILO GROUP	Italy	Consumer	B2C	3.92%	4.47%	2.74%	No	1,388	1,057	-69.16%
SAINT GOBAIN	France	Industrials	B2B	1.82%	1.54%	1.55%	Yes	44,601	22,191	-19.16%
SANDVIK	Sweden	Industrials	B2B	3.57%	2.81%	3.03%	No	9,941	12,855	1.99%
SANOFI	France	Health Care	B2C	2.43%	1.81%	1.75%	No	91,911	102,100	13.97%
SAP	Germany	Technology	B2B	2.92%	1.02%	1.57%	Yes	26,800	76,843	-4.39%
SCA 'A'	Sweden	Consumer	B2C	3.41%	2.37%	3.53%	No	15,977	1,956	-7.41%
SCHINDLER 'P'	Switzerland	Industrials	B2B	0.39%	0.38%	2.13%	No	6,199	4,947	18.38%
SCHNEIDER ELECTRIC SE	France	Industrials	B2B	5.63%	6.36%	7.23%	Yes	35,235	35,568	-47.15%
SEQUANA	France	Basic Materials	B2B	1.62%	1.44%	5.05%	No	2,189	143	-15.60%
SGL CARBON	Germany	Industrials	B2B	2.52%	1.01%	1.73%	No	1,956	2,046	-13.96%
SGS 'N'	Switzerland	Industrials	B2B	1.77%	1.62%	1.03%	No	3,971	13,098	2.57%
SIEMENS	Germany	Industrials	B2B	2.86%	1.25%	1.85%	Yes	98,702	87,658	-16.57%
SIKA 'B'	Switzerland	Industrials	B2B	1.31%	2.82%	1.66%	No	3,776	5,566	-6.38%
SKF 'A'	Sweden	Industrials	B2B	3.43%	2.66%	1.20%	Yes	7,794	735	-122.03%
SKW STAHL-METGIE.HLDG.	Germany	Basic Materials	B2B	1.96%	1.51%	1.58%	Yes	244	82	-17.12%
SMT SCHARF	Germany	Industrials	B2B	9.14%	11.18%	10.70%	Yes	59	84	0.84%
SODEXO	France	Consumer	B2C	3.89%	2.95%	1.89%	No	12,421	11,571	-52.63%
SOFTWARE	Germany	Technology	B2B	2.44%	1.14%	1.28%	No	1,981	2,206	20.75%
SOLVAY	Belgium	Basic Materials	B2B	1.57%	3.46%	3.44%	Yes	17,931	9,741	6.26%
SONOVA N	Switzerland	Health Care	B2C	1.53%	1.18%	1.24%	No	2,092	6,576	0.13%
SPIRAX-SARCO ENGR.	United Kingdom	Industrials	B2B	1.68%	1.89%	2.43%	Yes	796	2,713	0.21%
SSAB 'A'	Sweden	Basic Materials	B2B	5.55%	1.77%	15.61%	Yes	6,246	1,341	2.57%
STADA ARZNEIMITTEL	Germany	Health Care	B2C	20.79%	11.50%	23.79%	Yes	3,363	2,168	-15.30%
STALLERGENES	France	Health Care	B2C	3.14%	1.82%	2.17%	Yes	299	744	-42.81%
STHREE	United Kingdom	Industrials	B2B	3.92%	1.24%	1.13%	No	188	537	-0.79%
STO PREF.	Germany	Industrials	B2B	3.42%	1.92%	2.42%	No	693	351	-35.08%
STOCKMANN 'B'	Finland	Consumer	B2C	10.91%	13.63%	6.96%	No	2,027	458	8.01%
STORA ENSO 'R'	Finland	Basic Materials	B2B	3.18%	1.46%	4.15%	No	12,525	4,461	-34.00%

Overview of Key Sample Characteristics

General Company Information		Industry Specifications		Russia Exposure				Additional Company Characteristics		
Company Name	*HQ*	*Industry Name*	*B2C/B2B*	*%Sales*	*%Assets*	*%Employees*	*Growth*	*Total Assets (m€)*	*Market Cap. (m€)*	*CAR_Full_Crisis*
STRABAG SE	Austria	Industrials	B2B	4.14%	2.96%	3.53%	Yes	10,344	2,430	-9.59%
SUEDZUCKER	Germany	Consumer	B2B	1.77%	1.51%	2.50%	Yes	8,685	4,023	-21.77%
SULZER 'R'	Switzerland	Industrials	B2B	1.35%	1.70%	3.19%	Yes	3,632	4,023	2.33%
SWEDISH ORPHAN BIOVITRUM	Sweden	Health Care	B2C	2.13%	1.02%	1.02%	Yes	734	2,039	-6.90%
SYMRISE	Germany	Basic Materials	B2B	1.05%	0.87%	4.68%	No	2,164	3,962	22.57%
SYNGENTA	Switzerland	Basic Materials	B2B	3.64%	1.44%	1.48%	Yes	14,031	26,991	-31.29%
SYSTEMAIR	Sweden	Industrials	B2B	10.14%	4.18%	7.51%	Yes	429	784	-9.67%
TELIASONERA	Sweden	Telecommunications	B2C	3.08%	2.92%	1.15%	Yes	27,946	26,200	-22.18%
THE SWATCH GROUP 'B'	Switzerland	Consumer	B2C	1.49%	0.91%	2.29%	Yes	9,222	14,834	7.97%
THYSSENKRUPP	Germany	Industrials	B2B	2.84%	2.37%	1.70%	No	33,639	10,034	-23.45%
TNT EXPRESS	Netherlands	Industrials	B2B	1.56%	1.53%	2.43%	No	4,052	3,677	47.42%
TOM TOM	Netherlands	Technology	B2C	4.20%	3.35%	7.38%	No	1,668	1,144	-13.18%
TRELLEBORG 'B'	Sweden	Industrials	B2B	2.17%	3.14%	2.00%	No	3,012	3,506	7.71%
UCB	Belgium	Health Care	B2C	2.31%	0.79%	3.60%	Yes	9,409	9,931	14.44%
UNILEVER (UK)	United Kingdom	Consumer	B2C	2.82%	3.24%	4.30%	Yes	44,492	38,288	-11.09%
UPM-KYMMENE	Finland	Basic Materials	B2B	2.32%	2.29%	3.61%	Yes	14,035	6,500	-2.02%
UPONOR	Finland	Industrials	B2B	4.12%	3.25%	10.65%	No	645	1,041	-26.11%
WACKER CHEMIE	Germany	Basic Materials	B2B	1.56%	1.20%	1.25%	No	6,167	4,193	7.60%
VACON	Finland	Industrials	B2B	4.81%	5.97%	9.21%	No	209	895	-25.39%
VALEO	France	Consumer	B2B	3.00%	3.41%	1.22%	Yes	8,796	6,391	-68.19%
WARTSILA	Finland	Industrials	B2B	1.66%	0.19%	1.69%	Yes	5,081	7,055	13.68%
WIENERBERGER	Austria	Industrials	B2B	3.01%	2.79%	2.71%	Yes	4,165	1,355	-33.66%
VILLEROY & BOCH	Germany	Industrials	B2C	2.82%	1.67%	2.58%	Yes	551	148	-40.02%
VIRBAC	France	Health Care	B2C	5.72%	4.25%	11.68%	No	888	1,314	4.58%
VOESTALPINE	Austria	Basic Materials	B2B	3.78%	2.57%	2.86%	No	12,736	6,024	-15.40%
VOLKSWAGEN	Germany	Consumer	B2C	2.91%	3.00%	1.01%	Yes	318,711	58,133	-1.60%
VOLVO 'A'	Sweden	Industrials	B2C	3.42%	2.21%	2.01%	Yes	37,475	4,958	-19.83%
VOSSLOH	Germany	Industrials	B2B	9.77%	5.86%	26.54%	Yes	1,560	966	2.00%
VTG	Germany	Industrials	B2B	4.49%	3.12%	10.16%	Yes	1,528	317	-26.33%
YIT	Finland	Industrials	B2B	23.68%	32.28%	30.89%	Yes	2,512	1,293	-3.03%
ZEHNDER GROUP	Switzerland	Industrials	B2B	2.44%	1.17%	1.16%	Yes	413	326	-28.70%