

Financial Markets Facing Apocalypse in World War II*

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ABSTRACT

This paper quantifies the impact of apocalyptic risk on capital markets, drawing on events in four countries during the Second World War: the republics of Poland and France, whose systems failed during the period in question, and the United Kingdom and Sweden, which survived politically, economically and financially. We closely link public information to markets' incorporation of information regarding the probability of an Armageddon for each country. In contrast to past studies, our analysis shows that the stock markets of two of the countries in question – Poland and France – displayed limited ability to reflect the mortal danger to their sovereignty. The behavior of the other two countries' stock markets appears to reflect some "learning" regarding the implications of systemic political failure.

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1. Introduction

In this paper, we carefully analyze the importance of apocalyptic risk to capital markets. Apocalyptic risk is defined as risk posed by an event such as military invasion by a foreign power or a Communist-style revolution that can lead to the collapse of a country's political system and the abrogation of property/civil/human rights. In our study, we relate the sentiments expressed in public media to the degree to which financial markets quantified and incorporated the cataclysmic risks confronting their national bodies politic.

We use events during the Second World War to discern markets' incorporation of information regarding the probability of an Armageddon for each country.¹ The forward-looking nature of equity and bond markets renders them especially suitable for an analysis of major changing points in human history. Willard, Guinnane and Rosen (1996) use a time-series analysis "to determine which events of the U.S. Civil War were viewed as turning points by people at the time by using 'asset prices', specifically, the inconvertible currency called the Greenback." Following on that work, Frey and Kucher (2000, 2001) and Frey and Waldenström (2004) "analyze the prices of domestic and foreign government bonds traded before and during World War II." More recently, Choudhry (2010) studied the relationship between key World War II events and the Dow Jones Industrial Average. These studies examine the link between historical events and asset-market performance.

In the context of these studies, we undertake an event-study type of analysis of four national equity and bond markets facing the advent and initial consequences in 1939 of the Second World War in the European theater. The four countries are France, Poland, Sweden and the United Kingdom. We selected these countries judiciously. Due to military defeat in September 1939 and June 1940, respectively,

¹ It has been suggested that the danger of national collapse should be evaluated in terms of cash flows and risk premiums. We assume that these considerations are overwhelmed by the more fundamental issues concerning loss of human, civil and property rights.

two of them – Poland and France – suffered collapse at the beginning of the war. In reporting simultaneous news stories in these two countries, we document the differences between our study and that of Jorion and Goetzmann (1999), as well as the differences in the historical experience across the four countries' stock and bond markets.

Our other two countries – the United Kingdom and Sweden – subsequently faced apocalyptic risks but managed to survive with their constitutional structures intact. The United Kingdom faced an existential threat in the Battle of Britain in the autumn of 1940 immediately after the conclusion in June 1940 of the Battle of France. The Kingdom of Sweden faced similar threats during the war.² Although historians debate the dates when these threats “passed,” the national financial markets of both countries reflected their improving prospects in the succeeding years. We document these capital markets' reactions while recognizing the simultaneous news reports.

Among the papers that have addressed the issue of political risk, Berkman, Jacobsen and Lee (2011), “create a crisis index that shows substantial variation over time.” Although the authors concede they “lack long data series for Russian stock markets,” they notice “several months with missing observations for some European countries around the start of World War II,” and observe that “some monthly returns are missing for the German stock market at the end of World War II.” Apparently minimizing the lack of data and attributing it to “missing observations,” we contend their paper fails to recognize that some crises pose an existential threat to countries where markets are domiciled.

Another paper that has applied a similar event-study methodology is Oosterlinck and Weidenmier (2007), who consider Confederate gold bonds traded in Amsterdam from August 1863 through the end of the Civil War in the United States: the bonds' almost monotonic decline towards zero is clearly indicative of the probability of the Confederacy's survival as an independent state that could service its debt.

² By the time the United Kingdom and Sweden faced their existential threats, it was far more clear what a failure would entail.

Our primary conclusion refers to the failure of Polish and French capital markets to foresee the coming apocalypse in September 1939 in Poland and June 1940 in France. In contrast, it appears the British and Swedish markets did recognize the summer of 1940 as the time of their countries' greatest peril.

The paper is organized as follows. Section 2 presents an overview of the data sources we assembled together with our methodology, considering the special difficulties of capturing contemporary views of current events. Section 3 undertakes a separate analysis of four countries – Poland, France, the United Kingdom and Sweden – and their capital markets' reactions to the existential threat posed by the approach of the Second World War beginning in March 1938. Section 4 concludes.

2. Data and Methodology

We obtained data bearing on our research questions from the Global Financial Data (GFD) database and manually extracted information from microfilms available in the National Library of France, the National Library of Poland, the Royal Library in Sweden, and the library of the University of Texas at Austin.

The GFD database provides historical financial data on international stock indices. For most of the countries under consideration, U.S. dollar-denominated benchmarks are available from the early 1920s. Since total return indices were only available at an annual frequency, we use monthly capital return indices starting in January 1921, which are constructed with a uniform methodology. By contrast, analysis of government bond markets requires selection of proxies for each market. From the universe of time series we selected long-term debt instruments issued by governments. In the case of Poland, we collect data on the 5% state conversion loan, the bonds of which were issued between September 1924 and September 1926 and scheduled to mature in January 1965. In order to shed light on the difference between the performance of bonds issued in local and

foreign currency, we also examine the performance of the Polish 4% Premium Dollar Bond III. In the case of the French government bond market, we use 3% Consols. The GFD database provides 3% Consols as a proxy for French government debt for the period 1825 to 1949, while the 5% Consol serves for the years between 1950 and 1971. We obtain insight into the Swedish bond market by examining the 3% Consol. The data provider uses it for the period 1934-1957 as an indicator for Swedish long-term government bonds. As for the United Kingdom, we select the 4% Consolidated Loan issued in 1927 as a proxy for U.K. government bond performance. The price of UK. undated gilts was obtained from the U.K. stock database, which is part of the GFD database.

The GFD database pays special attention to the quality of its time series and therefore employs a double-blind proprietary research process that involves only primary sources. The database takes primary source information from government archives, exchanges, central banks and periodicals of record. Each dataset's history may come from varying sources and sometimes includes more than one primary source. The GFD database uses a third party to build the dataset with the same source material in order to confirm the accuracy of its findings. Such an approach provides multiple points of comparison, and any discrepancies are researched individually to ensure accuracy.

Like Willard, Guinnane and Rosen (1996), Frey and Kucher (2001) and Frey and Waldenström (2004), we use capital markets to determine the importance of historical events. One of our study's distinctive features is an examination of available indicators of public *sentiment* in countries facing an existential threat.³ In particular, we would like to evaluate how public sentiment affects the performance of domestic stock markets. Given our objectives, we focus only on sentiment proxies which were available at the time of his-

³ An open question is whether these articles measure *sentiment* or *investors' information sets*. While perhaps of some interest, we believe the issue is moot since in either case we would expect the item of interest to be impounded in market prices.

tory-shaping events.⁴ Accordingly, we refrain from referring to academic publications dealing with *ex post* analyses, which we believe are biased by knowledge of history after the key events affecting a given country. For the period under consideration, almost none of the modern commonly used proxies for market sentiment were available.⁵ Therefore, we decided to use articles from leading daily newspapers for information about key events as a proxy for public sentiment. For each of the four countries, we identify a newspaper with a high circulation and, whenever possible, a centrist political orientation. Together with our native-language-speaking research assistants, we selected newspaper articles on the looming German invasion. The matters treated in the articles include, but are not limited to, the reaction of public opinion, comments on external alliances, the response of the central government, opinions on international policy, evaluations of German foreign policy, and reports on the strength of the resident armed forces and the modernization of their hardware. The selected proxy for public sentiment is not free from biases. First, newspapers in the period around WW II contained difficult-to-measure doses of propaganda. Second, the level and complexity of information released to the public was much lower in the 1940s than it is now. Balanced against the existence of these biases is the fact that the general public back then had very limited access to alternative sources of information other than daily newspapers.

⁴ Using Diction software for sentiment analysis, we computed the dispersion of fifteen key metrics: Ambivalence, Tenacity, Satisfaction, Inspiration, Hardship, Aggression, Accomplishment, Communication, Passivity, Concreteness, Liberation, Denial, Optimism, Certainty and Realism – the within-category average dispersion and the cross-category average dispersion. The two categories are {United Kingdom, Sweden} and {France, Poland}. Interestingly, for all fifteen items with a single exception, the within-category dispersion is smaller than the cross-category dispersion, indicating greater within- than without-category commonality. See Tetlock (2007).

⁵ Compare with the sentiment indices prepared by Jeffrey Wurgler (<http://people.stern.nyu.edu/jwurgler/>) and the American Association of Individual Investors (<http://www.aaii.com>).

For each country, we sought articles in the month around key events preserved on microfilm. The center-right *Sunday Times (ST)*, established in 1822 and with a circulation approaching a half million in the mid-1940s, was selected for the United Kingdom. *Ilustrowany Kuryer Codzienny (IKC)*, published in Krakow between 1910 and 1939, was one of Poland's first nationwide daily newspapers. In the 1920s it grew to become Poland's most popular daily, with a readership exceeding one million. The paper had a centrist orientation and an average circulation of 250,000. The sentiment of the French public was measured using articles published in the daily center-right *Le Figaro* and the center-left *La Croix*. By the onset of World War II, *Le Figaro* had become France's leading newspaper. We include *La Croix* in our analysis because it was closed down comparatively late during the German occupation. Lastly, the daily *Göteborgs Handels-och Sjöfartstidning (GHT)* was a key newspaper in Sweden in the 1940s.

In addition to the above-described approach to quantify the impact of major World War II events on capital markets in Poland, France, Sweden and United Kingdom, we apply an econometric technique to detect structural breaks in time series, a technique in line with the method already used in the studies by Willard, Guinnane and Rosen (1996), Frey and Kucher (2001) and Frey and Waldenström (2004). The procedure consists of four steps. In the first step we examine a 36-month widow to estimate:

$$\ln(P_{i,t}) = \gamma_0 + \gamma_1 \ln(P_{i,t-1}) + \gamma_2 \ln(P_{w,t-1}) + \varepsilon_{i,t} \quad (1)$$

where $P_{i,t}$ is a USD-denominated equity index or inflation-adjusted equity index i at date t . $P_{w,t}$ is the level of a global index portfolio at date t . We consider two global equity benchmarks, one denominated in USD and other inflation-adjusted. In our paper, we refer to the method used by Jorion and Goetzmann to construct a global equity portfolio. They constructed a value-weighted global equity index using data on international stock markets sourced from Morgan Stanley Capital International Perspectives (MSCIP) for developed markets and from International Finance Corporation (IFC) for emerging markets. Due to the lack of reliable data on market capitalization for

all the markets they examined for the period 1921-1996, they assigned weights based on gross domestic product (GDP). The GDP data were obtained from Mitchell (1992, 1993, 1995) and converted into U.S. dollars using annual averages. Jorion and Goetzmann's study shows that the GDP weights are of about the same order of magnitude as the market-value weights implied by capitalization. At the beginning of each decade of the 20th century there is portfolio rebalancing, with weights determined by the altered distribution of world GDP. Jorion and Goetzmann argue that a value-weighted scheme is appropriate for measuring investor returns when survival is an issue.

Our study suggests an approach to constructing a world index portfolio that takes into account the proposition that without human, civil and property rights there is no free market. We construct a value-weighted global equity index using the same data applied in the Jorion-Goetzmann method. The country indices and GDPs denominated in U.S. dollars were sourced from GFDatabase. As in Jorion and Goetzmann (1999), we assigned weights based on GDP. In the case of non-violation of human, civil and property rights at country level, ordinary rebalancing takes place at the beginning of each decade. Any such violation leads to a rebalancing of the world portfolio – the value of the affected stock market is assumed to be 0 (investors lose all their capital invested in that market), and the country is excluded from the world portfolio until the basic rights of all residents are restored, whereupon a second rebalancing occurs and the country is reinstated in the value-weighted world portfolio. Table 1 presents the composition of a global index portfolio. In the early 1920s, the portfolio comprises 20 countries; during World War II, it contains 31 countries. The last rebalancing in the 1990s produces a global portfolio of 34 countries.

We include the performance of the global benchmark in our regression to identify country-specific breaks. Another advantage of using a market index is that it corrects for potential exogenous shocks to data that affect all countries in a similar way. Adding the World index benchmark to equation (1) addresses issues of potential bias due to omitted variables in the model specification. Next, we

TABLE 1
Composition of World Index for Countries with Continuity of Human and Property Rights

Period/ Month	1/21-1/30	1/30-4/33	4/33-4/38	4/38-10/38	10/38-9/39	9/39-1/40	01/40-5/40	5/40-6/40	6/40-12/40	12/40-9/43	9/43-7/44	7/44-8/44	8/44-4/45	4/45-6/45	6/45-7/46	7/46-10/46	10/46-1/50	1/50-3/50	3/50+3/57	3/57-1/60	1/60-1/70	1/70-1/80	1/80-1/90	1/90-12/96	
ARG	X																								
AUS																									
AUT	X																								
BEL																									
BRA	X																								
CAN																									
CHL	X																								
COL	X																								
CZE																									
DNK																									
EGY	X																								
ESP																									
FIN																									
FRA																									
GER																									
GRE	X																								
HUN																									
IND																									
IRL	X																								
ISR	X																								

(continued)

(continued)

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Composition of World Index for Countries with Continuity of Human and Property Rights

Period/ Month	1/21-1/30	1/30-4/33	4/33-4/38	4/38-10/38	10/38-9/39	9/39-1/40	01/40-5/40	5/40-6/40	6/40-12/40	12/40-9/43	9/43-7/44	7/44-8/44	8/44-4/45	4/45-6/45	6/45-7/46	7/46-10/46	10/46-1/50	1/50-3/50	3/50+3/57	3/57-1/60	1/60-1/70	1/70-1/80	1/80-1/90	1/90-12/96
	108	39	60	6	11	4	4	1	6	33	10	1	8	2	13	3	39	2	84	34	120	120	120	83
ITA	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
JPN	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
MEX	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
NED	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
NOR	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
NZ	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
PAK	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
PER	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
PHL	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
POL	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
POR	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
ZAF	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
SUI	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
SWE	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
UK	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
URY	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
USA	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
VEN	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□

The table shows the composition of the world index constructed for markets/periods with continuity of human and property rights. The weights are set by GDP weights at the beginning of each decade. Each row indicates the countries included in the world index (by □) and countries excluded from it (by X). The approach adopted assumes that where countries experience discontinuity of human and property rights, the value of the index is zero.

run the Wald test for structural break in the middle of the 36-month window and record F statistics. In order to identify a window for structural break, we plot the sequence of F statistics against time. The peaks in F -diagrams (for each country there are three diagrams) are selected as potential candidates for windows within which a structural break may have occurred. After identifying windows, we proceed with the fourth step of procedure: In each preselected window we run the model

$$\ln(P_{i,t}) = \gamma_0 + \gamma_1 \ln(P_{i,t-1}) + \gamma_2 \ln(P_{W,t-1}) + \gamma_s D_{s,t} + \varepsilon_{i,t} \quad s = 1, \dots, 42 \quad (2)$$

where $D_{s,t}$ is a dummy variable taking the value 0 for dates up to the shift and 1 thereafter. We repeat estimation of equation (2), each time moving s by one month. The coefficient γ_s measures the sign and size of structure breaks. Since we are dealing with war events, we don't expect gradual structural breaks, and the above procedure is an appropriate one.

3. Europe, Post-1938

3.1 *Existential Threats in Interwar Europe, 1918-1939, and World War II*

The interwar period in Europe extends from the armistice that ended the First World War on November 11, 1918, up to the hostilities that began the Second World War in Europe on September 1, 1939. In our analysis, we consider the stock and bond markets of four countries during that span of time: Poland, France, Sweden and the United Kingdom. During that interwar period these four countries faced existential threats, which we define as threats to their existence and viability as a modern country, and threats that put their populations' civil rights at risk.⁶ As is well known, two of these countries succumbed to their threats, whereas two were able to maintain a continuity of their institutions, markets and civil rights.

⁶ We recognize that in 1939 the quality of democracy and civil rights in these four countries was not uniform. See McMillian (1985), Wieczorkiewicz (1991), Leczyk (2006), Neville (1995), Sejersted (2011) and Clarke (2011).

In presenting these empirical results, we underline that our analysis should be contrasted with Figure 2 from the 1999 paper by Jorion and Goetzmann, headed “Real stock prices before interruption” (see p. 969). Whereas theirs is a summary across all nations, our approach is country-specific and thus delineates the differences across disparate national markets, including markets that succumbed and markets that survived their existential threats.

To understand the nature of stock and bond markets during this period, we consider certain critical events (see Table 2).⁷

3.2 *The Role of the U.S. Dollar - Convertibility from Local Currency*

Since we are examining the stock and bond markets’ evaluations of important events, including existentially threatening ones, it is appropriate to address the issue of *numeraire*, which we take as the local currency adjusted for the rate of change in its exchange with the U.S. dollar. We explicitly make two critical assumptions:

1. At perhaps non-negligible cost, it was possible for investors in the various European countries to acquire U.S. dollars and to use them as a store of purchasing power.

The thrust of this assumption is to assign importance to the local-currency values of the stock and bond markets, *adjusted for* their exchange-rate value to the U.S. dollar, and to embody them with purchasing-power. Thus, unless otherwise noted, all results are those adjusted for changes in the exchange rate.

This may be contrasted with, say, the value of the U.S. stock market in October 1962 (the Cuban Missile Crisis). The relatively moderate decline in the U.S. market at the time – its maximum loss from crisis onset to resolution was a modest -4.7% – can be ascribed to a variety of factors, one being the lack of a liquid alternative “risk-free” investment.

⁷ Certain events were of specific importance to the Kingdom of Sweden and the United Kingdom, so we defer detailed discussion of them to the subsection dealing with Sweden and United Kingdom, respectively.

2. The U.S. dollar represented the riskless asset at the time.

Together, these two assumptions give meaning and significance to the value of stocks and bonds.

TABLE 2
Critical Events, Europe, 1938-1941

Date	Event	Significance
March 12, 1938	Austrian Anschluss	Incorporation of Austria into Nazi Germany; first violation of World War I's Treaty of Versailles beyond Germany's borders
September 30, 1938	Munich Accord	Agreement by United Kingdom and France, imposed on Czechoslovakia, permitting German annexation of the Sudetenland
March 31, 1939	United Kingdom and France extend guarantee to Poland	Germany extends its reach beyond German-speaking lands: Following German dismemberment of rump Czechoslovakia, United Kingdom and France guarantee Polish independence. Generally regarded as the end date of the British and French policy of "appeasement"
April 28, 1939	Abrogation of German-Polish Non-Aggression Pact	Pact unilaterally abrogated by Germany; increased likelihood of general hostilities in Europe
September 3, 1939	United Kingdom and France declare war on Germany	Following Germany's invasion of Poland on September 1. Beginning of World War II in Europe
June 22, 1940	French Armistice	The "Battle of France" concludes with German victory; end of Third French Republic
July 7, 1940	Beginning of the Battle of Britain	Air offensive of the German air force against the United Kingdom, seen as preparatory for a German invasion of the home islands The end of the Battle of Britain is typically dated as October 31, 1940
June 22, 1941	German invasion of the Soviet Union	Entry of the Soviet Union into war ends Britain's status as the sole European belligerent against Germany and Italy
December 7, 1941	Japanese attack on Pearl Harbor and other Hawaiian military facilities	Entry of the United States into World War II

3.3 *Republic of Poland, to September 1, 1939*

Located at the intersection between central and eastern Europe, Poland has borne the consequences of geography at least since the three partitions of the Polish-Lithuanian confederacy, 1772-1795. Deprived of its sovereignty for 123 years, Poland was reborn with the end of the First World War. The consequences of geography for the country's destiny again loomed large as storm clouds gathered over Europe in the late 1930s. The Second World War brought the dissolution of Poland in 1939 and resulted in extreme hardship for its population. Although the invasion of Poland was the reason the United Kingdom and France declared war in 1939, it can be said that Poland did not truly regain independence and national sovereignty until the establishment of a non-communist Republic of Poland in the 1990s.

Table 2 has already set out the events preceding September 1, 1939. Seeking to understand the market consequences of these events, we surveyed a contemporary national publication in Poland, in order to determine whether the *ex-post* results of the German attack and the consequent Soviet invasion of September 17 were fully or partially anticipated by market participants. An exercise of this kind is very challenging, because in circumstances like those prevailing in August 1939 national authorities may engage in hype, disinformation or "propaganda" whose purpose is to bolster the "national spirit."

Table 3 summarizes headlines and titles of main articles published by *Ilustrowany Kuryer Codzienny (IKC)* ("Illustrated Daily Courier") around key events. At the time, that daily had the highest circulation among all newspapers available prior to World War II.

As Table 3 shows, *IKC* reported the events leading to the outbreak of hostilities on September 1, 1939. At the time of the September 1938 Munich Accord, the newspaper seemed to share the "peace for our time" sentiment expressed by some statesmen. Less than a month later, Germany pressed its first demands upon Polish authorities concerning Poland's sole access to the Baltic Sea, the Danzig

TABLE 3
Headlines of Newspapers Around Crucial Events for Polish Capital Market

Date & Event	Description & Titles/Newspapers/Publication date
09/30/1938 Munich Accord	<p>The Munich Agreement permitted Nazi Germany's annexation of Czechoslovakia's areas along the country's borders mainly inhabited by German-speakers, a territory designated the Sudetenland.</p> <ol style="list-style-type: none"> 1. "Historic moments in Muenchen Palace – War was prevented", <i>IKC</i>, 10/02/1938 2. "Does Europe still have a chance for Demobilization? Economic perspectives on the world after Munich conference", <i>IKC</i>, 10/02/1938 3. "World peace maybe was saved-but future of Czechoslovakia still unclear", <i>IKC</i>, 10/07/1938 4. "Idyll of great four is gone – new fortification in West announced by Hitler", <i>IKC</i>, 10/11/1938 5. "Before new German offensive in Danube valley – third stage of brown march", <i>IKC</i>, 10/11/1938
10/24/1938 German demands on Poland	<p>German request for the incorporation of the Free City of Danzig and an extra-territorial highway through Polish territory.</p> <ol style="list-style-type: none"> 1. "Poland will stand on guard of independence, unification and honour", <i>IKC</i>, 11/01/1938 2. "Great show of Polish aerospace industry – new fighter, mid-range bomber and dive bomber", <i>IKC</i>, 11/06/1938 3. "What will be next after Sudetenland? -next phase of German expansion", <i>IKC</i>, 11/07/1938 4. "Does United Kingdom satisfy German hunger from other plates? – shortage of commodities in Europe", <i>IKC</i>, 11/19/1938 5. "German roads" -new unknown instrument of Third Reich expansion", <i>IKC</i>, 11/27/1938
03/31/1939 British and French guarantee to Poland	<p>United Kingdom and France pledged their support to guarantee Polish independence after the German invasion of Czechoslovakia.</p> <ol style="list-style-type: none"> 1. "British military guarantees of Polish borders", <i>IKC</i>, 04/01/1939 2. "Why Germany won't win a world war", <i>IKC</i>, 04/01/1939
04/28/1939 Abrogation of German-Polish Non-Aggression Pact	<p>The pact was unilaterally abrogated by Germany.</p> <ol style="list-style-type: none"> 1. "Hitler has followed in the footsteps of his predecessors Wilhelm II and Stresemann- such (his) policy leads to the same known outcome", <i>IKC</i>, 04/30/1939 2. "Italian government expressed deep concern over German repudiation of Non-Aggression Pact (with Poland)", <i>IKC</i>, 04/30/1939 3. "United Kingdom (Polish ally) calmly takes command of fight for freedom -Sir Simone", <i>IKC</i>, 04/30/1939 4. "Today 100 airplanes over Cracow – parade of mighty Polish Air Force", <i>IKC</i>, 05/01/1939 5. "Germany needs to show respect for world peace, Poland won't be separated from Baltic sea – answer of Polish Foreign Minister Beck", <i>IKC</i>, 05/05/1939
09/01/1939 Invasion of Poland by Germany	<p>Germany's invasion of Poland on September 1, 1939 began World War II.</p> <ol style="list-style-type: none"> 1. "German newspapers on inevitability of Polish air strike on Berlin", <i>IKC</i>, 06/20/1939 2. "Hitler will finish off German nation for years to come", <i>IKC</i>, 08/18/1939 3. "Overwhelming military superiority of Peace Bloc over Axis countries", <i>IKC</i>, 08/19/1939 4. "1:14 and 1:5 there is no way that they (Axis countries) can win it", <i>IKC</i>, 09/01/1939

The table summarizes the headlines and titles of main articles published by *Ilustrowany Kurjer Codzienny (IKC)* around key events for the existence of the state and of the capital market. The newspaper had the highest circulation among all newspapers available before World War II. Selected titles are used as a proxy for society's expectations. The dates are in American-style.

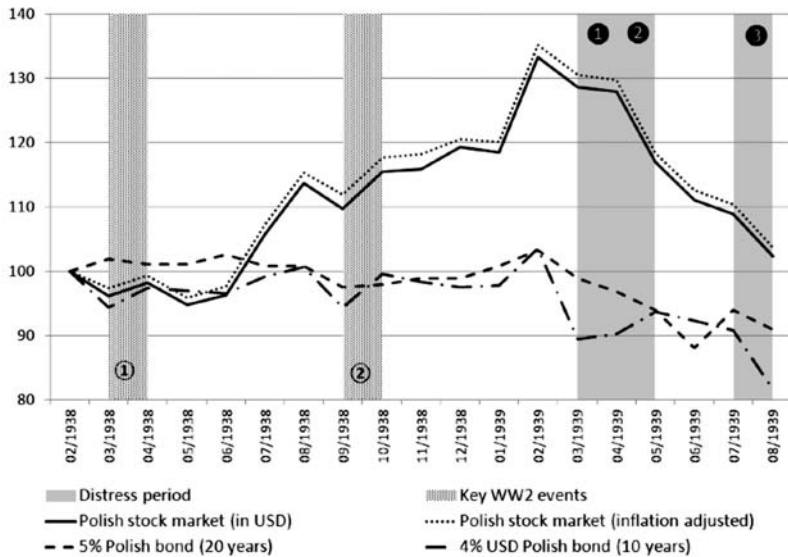
Corridor, established after World War I. The subsequent train of events brought the disintegration of rump Czechoslovakia (March 15, 1939), the pledge of support to Poland by Britain and France (March 31, 1939), the unilateral abrogation of the German-Polish Non-Aggression Pact (April 28, 1939) and the German attack on Poland (September 1, 1939). It can be observed that the August 1939 headlines are relatively bullish regarding immediate Polish and allied military prospects.

Figure 1 presents price indices for the Polish stock market (in USD and inflation-adjusted terms) as well as for Polish bonds issued in the local currency (5% state conversion loan) and the U.S. Dollar (4% Premium Dollar Bond III) over the period February 1938 – August 1939. As is to be expected, across all stock and bond markets equities constitute a riskier and hence higher-volatility asset.

Based on month-end data, Polish stock and bond markets peaked in February 1939, some 15 days before the critical events of March 1939, and then entered a secular decline that accelerated as the abrogation of the non-aggression pact paved the way for hostilities. From the February 1939 peak to the end of August 1939, stock prices fell 23.2%, while 5%-coupon and 4%-coupon dollar-denominated bonds declined by 11.8% and 21.3%, respectively.

Analysis of structural breaks for Polish capital markets finds that the government bond market reacted negatively to the incorporation of Austria into Nazi Germany (see Table 4). The Polish 5% bond with maturity 1965 fell by more than 11% in March 1938. A similar response of the bond market was recorded in November 1938, when German demands were rejected. At the end of October 1938, German foreign minister Joachim von Ribbentrop met with Polish ambassador Józef Lipski and requested Polish approval for an extraterritorial highway and railway through western Poland to connect East Prussia with the rest of Germany. Ribbentrop also expected Poland to agree to a change of status for the city of Danzig, which was to become part of Nazi Germany. The Polish stock market experienced two structural breaks in the months preceding the start of the war. In March 1939, the stock market index dropped by more than 6%.

FIGURE 1
Performance of the Polish stock and bond markets
(February 1938-August 1939)



The figure displays the performance of the Polish stock and bond markets during the period between February 1938 and August 1939. It also shows the performance of Polish bonds held by local and foreign investors. The shaded areas to the right correspond to periods crucial for the continuation of the Polish stock and bond markets. The areas are numbered as follows (on top): 1- British guarantee to Poland, 2- Abrogation of German-Polish Non-Aggression Pact, 3- Britain and France declare war on Germany after its attack on Poland. At the bottom of the figure, key events for the coming of WW2 are highlighted and numbered: 1- Annexation of Austria, 2- Munich Accord and German demands on Poland.

March and April were a crucial period for Polish sovereignty. Following Germany's dismemberment of what was left of Czechoslovakia, the United Kingdom and France guaranteed Polish independence. In April 1939, Nazi Germany abrogated the German-Polish non-aggression pact and cleared the way to military confrontation. The destruction of the Polish stock market is evidenced in before-and-after photographs of the Stock Exchange building (see Figure 2). Our analysis of sentiment and structural breaks shows that neither the public nor capital market investors anticipated the outcome of those events.

TABLE 4
Detected Structural Break-Points together with Historical Events
for Polish and French Capital Markets

Date	Bond market	Stock market (in USD)	Stock market Inflation-adjusted	Major events
Panel A: Poland				
March-38	-11.12%** (0.0172)	–	–	Germany annexes Austria
November-38	-9.20%** (0.0218)	–	–	German request for the incorporation of the Free City of Danzig (Gdańsk)
March-39	–	-6.26%** (0.0448)	-6.04%** (0.0500)	Following German dismemberment of rump Czechoslovakia
April-39	–	-6.26%** (0.0468)	-6.03%* (0.0610)	Abrogation of German-Polish Non-Aggression Pact. The pact was unilaterally abrogated by Germany
Panel B: France				
May-40	–	-24.9%*** (0.0099)	-13.7%* (0.0673)	Beginning of the Battle of France, Belgian capitulation

The table presents changes in the conditional mean, equivalent to estimation of parameter γ from equation (2). Panels A and B present structural break points for the Polish and French capital market, respectively. ***, **, * denote 1%, 5% and 10% significance levels.

FIGURE 2
The Warsaw Stock Exchange before - and - after 1939



The Warsaw Stock Exchange (Warszawska Giełda pieniężna) in Kr lewska Street. This building housed the exchange from 1876 until September 1939, when it was destroyed by German bombs.

3.4 French Republic, to June 22, 1940

After the end of World War I in November 1918, the French Republic struggled to regain its pre-war economic, political and military equilibrium. France had suffered grievously from the fighting that had taken place on its home soil and was buffeted by political and economic winds during the interwar period. Many military experts, perhaps with benefit of hindsight, have blamed France's lack of coherent national will, passivity and defeatism (as exemplified by the Maginot Line's fixed fortifications) for its failure to withstand the initial German onslaught in World War II. In the event, while France did declare war in September 1939, it undertook no significant offensives during the "phony war", and together with its British ally was only able to hold out militarily from May 10 to June 22, 1940, before conceding defeat and suing for peace.

Table 5 summarizes headlines and titles of main articles published by *Le Figaro* and *La Croix*. The former was (and is) among the French newspapers with the widest circulation.

TABLE 5
Headlines of Newspapers Around Crucial Events for French Capital Market

Date & Event	Description & Titles/Newspapers/Publication date
09/30/1938 Munich Accord	<p>The Munich Agreement permitted Nazi Germany's annexation of Czechoslovakia's areas along the country's borders mainly inhabited by German-speakers, a territory designated the Sudetenland.</p> <ol style="list-style-type: none"> 1. "The calm of the French people is to be admired – the Italian press acknowledged", <i>LF</i>, 9/26/1938 2. "London's decisions are to be taken only with Paris' agreement", <i>LF</i>, 9/26/1938 3. "In case of German aggression, France, Great Britain and the USSR would defend Czechoslovakia", <i>LF</i>, 9/27/1938 4. "Defensive measures are being taken in France: Passive defense, All the aviation factories will work on Saturday and facilities will be provided to mobilized debtors", <i>LF</i>, 9/30/1938 5. "The Council of Ministers congratulates M. Daladier unanimously", <i>LF</i>, 10/1/1938 6. "M. EDOUARD DALADIER has rekindled the flame while a huge crowd struck up the French national anthem, the Marseillaise", <i>LF</i>, 10/3/1938 7. "M. Daladier develops a 'new' plan for the recovery of our economy", <i>LF</i>, 10/6/1938

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TABLE 5
Headlines of Newspapers Around Crucial Events for French Capital Market

Date & Event	Description & Titles/Newspapers/Publication date
03/31/1939 British and French guarantee to Poland	United Kingdom and France pledged their support to guarantee Polish independence after the German invasion of Czechoslovakia. 1. "FRANCE WANTS PEACE AND FREEDOM FOR ALL CITIZENS but any kind of violence against it WOULD BE BROKEN UP declared M. Edouard Daladier", <i>LF</i> , 3/30/1939 2. "M. Chamberlain's speech reflects the desire of Paris and London to meet force with force", <i>LF</i> , 3/31/1939 3. "Moscow shows a defiant attitude toward Paris and London", <i>LF</i> , 4/3/1939
09/03/1939 Britain and France declare war on Germany	Germany's invasion of Poland on September 1, 1939 began World War II. 1. "Cellars and attics converted into shelters to face air attacks" <i>LF</i> , 8/28/1939 2. "In Paris, drastic measures are taken to ensure the safety of civilians" <i>LF</i> , 8/30/1939 3. "Italian public opinion is impressed by the serenity and energy demonstrated by the French", <i>LF</i> , 8/30/1939 4. "French and British naval supremacy... leaves no doubt for the American insurance companies" <i>LF</i> , 9/1/1939 5. "The state of siege proclaimed in France and Algeria", <i>LF</i> , 9/2/1939 6. "Parliament voted unanimously for funds allocated to national defense", <i>LF</i> , 9/3/1939 7. "General mobilization continues calmly in the whole French empire", <i>LF</i> , 9/5/1939
06/22/1940 French Armistice	German victory in the Battle of France led to French capitulation. 1. "Marshal Petain, president of the Council, gave a speech to the country", <i>LC</i> , 6/18/1940 2. "The stirring address of Marshal Petain", <i>LC</i> , 6/21/1940 3. "Plenipotentiaries have received the terms of the Armistice" (Some articles are censored), <i>LC</i> , 6/22/1940 4. "The armistice between France and Germany has been signed", <i>LC</i> , 6/24/1940 5. "Marshal Petain to be trusted", <i>LC</i> , 6/24/1940 6. "Our country's pride remains spotless-Marshall Petain declared", <i>LC</i> , 6/25/1940 7. "Day of national mourning – Hostilities with Germany and Italy ceased on Monday night at 0:35 AM", <i>LC</i> , 6/26/1940 8. "We have to restore the image of France by showing its exemplary calm, its hard work and its dignity" Marshal Petain declared", <i>LC</i> , 6/27/1940.

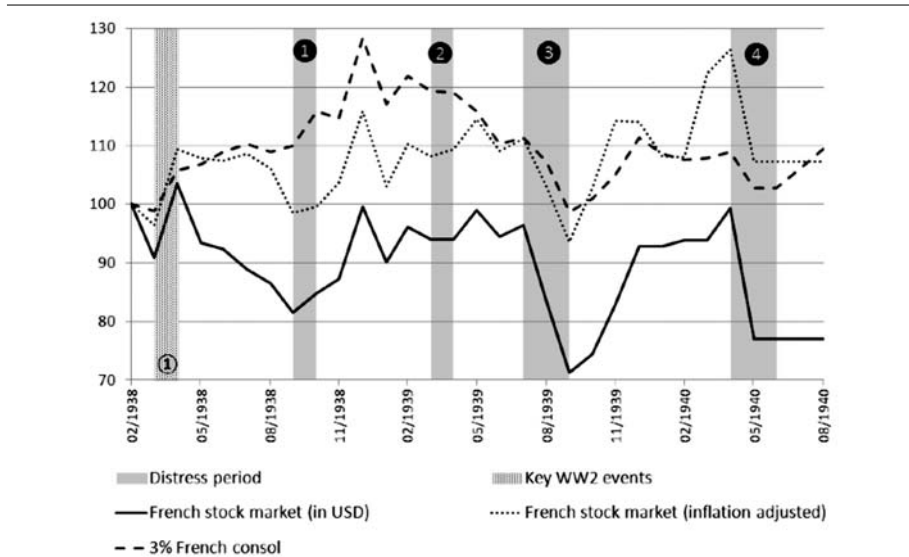
The table summarizes the headlines and titles of main articles published by *Le Figaro* (*LF*) and *La Croix* (*LC*) around key events for the existence of the state and of the capital market. *Le Figaro* was one of the largest-selling French newspapers. Selected titles are used as a proxy for French society's expectation. The dates are in American-style.

The stories in the French newspapers constitute a mixture of hope, defiance and confidence. It is not until the armistice had been negotiated that one finds talk of "national mourning" coincident with the pronouncements of the post-armistice French government.

French stock and bond markets provide interesting insight into the prevailing views of those capital markets. Figure 3 presents price indices for the French stock market (in USD and inflation-adjusted

terms) as well as the 3% French Consol bond for the period February 1938 – June 1940.

FIGURE 3
Performance of the French stock and bond markets
(February 1938-August 1940)



The figure displays the performance of the French stock and bond markets during the period between February 1938 and August 1940. The shaded areas correspond to periods crucial for the continuation of local stock and bond market. The areas are numbered as follows (on top): 1- Munich Accord, 2- British and French guarantee to Poland, 3- Britain and France declare war on Germany, 4- German victory in the Battle of France. At the bottom of the figure a previous key event for the coming of WW2 is highlighted and numbered: 1- Annexation of Austria.

Considering USD-adjusted returns, the French stock market enjoyed brief rallies in the aftermath of Austria's acquiescence with *Anschluss* (14% rise; the 3% Consol simultaneously posted a 7% return) and post-Munich euphoria. As further events unfolded, the stock market lost 26% with the outbreak of World War II (the bond declined 11.5%), then recorded a "recovery" presumably attributable to the initially "phony war" on the Western Front. Finally, the stock market tumbled by 22.4 % (the bond fell 5.6%) from the end of April

through the end of May 1940, at which time trading ceased, not to resume until March 1941.⁸

The econometric approach for detecting structural changes in French time series enables us to show that the French stock market experienced a major blow in May 1940. The USD-denominated index lost almost 25% and, inflation-adjusted, sank by 13.7% (see Table 4). We ascribe these losses to the beginning of the Battle of France and to Belgium's capitulation to the fast-advancing German army.

Two comments are called for here. First, the stock and bond declines from April through May, though of significant magnitude, did not reflect the calamitous events of *June* 1940: Germany launched the second phase of its Western Front *Blitzkrieg* on June 5, and the city of Paris surrendered on the 14th. The same month witnessed the demise of the Third French Republic after it signed the armistice on June 22.

Second, French stock and bond markets resumed trading in March of 1941. Given the lack of continuity, consistency and, indeed, *identity* between trading during the Third French Republic and trading under the Armistice-Vichy institutional structure, this paper does not examine the period after June 1940. The Armistice-Vichy institutional structure embodied a lack of civil and human rights, rendering the "value/purchasing-power" of money meaningless.

3.5 *Kingdom of Sweden, 1938-1945*

Sweden, much like the Swiss Confederation in both world wars and the Netherlands in the first, was the mirror-image of Poland in being a *beneficiary* of its geography. Located on the periphery of Continental Europe, Sweden was absolved from post-Napoleonic mili-

⁸ We consider trading activities between May 1940 and France's 1944 liberation to be at significant variance with "free markets," owing in part to the absence of human, civil and property rights during the occupation. Papers by Oosterlinck (2004 and 2010) and Occhino et al. (2007) document some of the specific burdens under which the French market operated at the time.

tary entanglements and permitted a neutrality it did not always scrupulously observe. One inadvertent but crucial benefit accrued from the dissolution of its union with the Kingdom of Norway in 1905: Norway was a separate entity in World War II, not linked to Sweden by a mutual-defense treaty, and so an attack on Norway did not automatically constitute an attack on Sweden.

To the east of Sweden lies the Republic of Finland, which during World War II found itself in hostilities twice against the Soviet Union (the Winter War and the Continuation War) and then against Germany. From these, too, Sweden was exempt. Sweden's conduct during World War II has traditionally been described as "small-state realism," i.e. the *realpolitik* accommodation seemingly required of a small state in times of global-power hostilities. See Östling (2001) for a discussion.

Table 6 summarizes the headlines and titles of the main articles published by *Goetborgs Handels-och Sjöfartstidning* (GHT) around key events for Sweden during our observation period. GHT was a leading daily newspaper published until 1973.

TABLE 6
Headlines of Newspapers Around Events Crucial for Survival
of Swedish Capital Market

Date & Event	Description & Titles/Newspapers/Publication date
11/30/1939 Start of Soviet-Finnish war	The conflict known as the Winter War lasted from November 30, 1939, to March 13, 1940. It was concluded with the Moscow Peace Treaty. Finland ceded 11% of its pre-Soviet territory and 30% of its economic assets to the Soviet Union. 1. "The entire Nordic Region in anguished tension", <i>GHT</i> , 11/29/1939 2. "In the danger zone" An article on how close Sweden may be and what we need to do in terms of rearming. <i>GHT</i> , 11/29/1939 3. "State Department sends ships to Finland to pick up Swedish citizen", <i>GHT</i> , 11/30/1939 4. "Mobilization in Sweden not yet imminent", <i>GHT</i> , 11/30/1939 5. "Sweden looks after Finnish interests in Moscow", <i>GHT</i> , 12/01/1939 6. "Do not spread rumours causing concern!", <i>GHT</i> , 12/01/1939 7. "Prime Minister assures sympathy for Finland – Despite all the difficulties, the neutrality policy to be pursued", <i>GHT</i> , 12/02/1939 8. "Crowds in Stockholm praise Finland – Singing and cheering outside the legation", <i>GHT</i> , 12/02/1939 9. "People and defense are agreed in Sweden – no warmonger but freedom should be safeguarded", <i>GHT</i> , 12/04/1939

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TABLE 6
Headlines of Newspapers Around Events Crucial for Survival
of Swedish Capital Market

Date & Event	Description & Titles/Newspapers/Publication date
06/10/1940 Norway capitulates to Germany	<p>The conflict lasted from April 9 to June 10, 1940, and resulted in Norway being occupied by German forces.</p> <ol style="list-style-type: none"> 1. "The battle in Norway is ended – it is passed on outside the country", <i>GHT</i>, 06/10/1940 2. "Norway puts down its arms", <i>GHT</i>, 06/10/1940 3. "One day, the free Norwegian flag will be hoisted again – proclamations by the Norwegian Government and Commander in Chief", <i>GHT</i>, 06/11/1940
07/07/1940 German-Swedish agreement admitted	<p>The official agreements on the Permittenttrafikken between Germany and Sweden are signed.</p> <ol style="list-style-type: none"> 1. "German military on Swedish railways to Norway – Transit has been granted 'after the end of hostilities'", <i>GHT</i>, 07/06/1940 2. "English shrug to Sweden – but the foreign office has the transit in memory", <i>GHT</i>, 07/06/1940 3. "Sweden pretends neutrality which has ceased to have meaning. Sharp English criticism of Swedish government line", <i>GHT</i>, 07/10/1940
06/24/1941 Midsummer crisis	<p>Germans asked Sweden to allow the transportation of armed German troops. The Swedish government granted this permission.</p> <ol style="list-style-type: none"> 1. "Freedom of the press is essential if democracy is to prevail", <i>GHT</i>, 06/19/1941 2. "About the Swedish policy of neutrality". The article suggests that the government believes in a German victory and responds accordingly. <i>GHT</i>, 06/23/1941 3. "No source of concern for the weekend, other than within politics" – describes Swedes as happy celebrating midsummer in the sunshine; though they are well aware of the war, they're not that bothered, <i>GHT</i>, 06/23/1941 4. "Sweden allows the transit of German troops through Nordland", <i>GHT</i>, 06/26/1941 5. "Leniency towards Germany gives birth to new demands – Increasingly difficult for Sweden to maintain its neutrality", <i>GHT</i>, 06/28/1941 6. "Before it is too late," will Sweden continue to give in, or will we be able to continue to keep neutrality?, <i>GHT</i>, 06/30/1941
06/25/1941 Continuation War	<p>The beginning of the "Continuation War", between the Soviet Union and Finland.</p> <ol style="list-style-type: none"> 1. "State uncertain, especially in Finland and Rumania- suspense / anxiety in Sweden", <i>GHT</i>, 06/21/1941 2. "The fire spreads: now that Finland is with Germany", <i>GHT</i>, 06/23/1941 3. "The stock exchange": The stock market has not been the same since June 10 due to the Germany-Russia tension, <i>GHT</i>, 06/23/1941 4. "Swedish armour weapon in strong development", <i>GHT</i>, 06/27/1941 5. "Even narrower": The German-Russian War has led to a lessening of Sweden's economic freedom. The space for Swedish foreign trade has become even tighter, <i>GHT</i>, 06/28/1941 6. "The stock exchange": The German-Russian War has not brought about a profound reversal of the situation on the Swedish stock market, <i>GHT</i>, 06/30/1941
02-3/1942 The February crisis followed by mobilization	<p>In Sweden it is believed that Germany regards a pre-emptive occupation of Sweden as necessary, to prevent Sweden from cooperating with an Allied landing in Norway.</p> <ol style="list-style-type: none"> 1. "German aircraft on the coast of Skåne", <i>GHT</i>, 02/09/1942, 2. "War Organization of the workforce should be prepared now – Industry Commission currently against new aerospace industry", <i>GHT</i>, 02/21/1942,

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TABLE 6
Headlines of Newspapers Around Events Crucial for Survival
of Swedish Capital Market

Date & Event	Description & Titles/Newspapers/Publication date
	<ol style="list-style-type: none"> 3. "Our aerospace industry inspires high hopes – Minister for Defense's speech in Gothenburg. Boldness and imagination required" Underscores the importance of having a strong defence in the air, on land and on the water, <i>GHT</i>, 02/21/1942 4. "Our country will never itself take the initiative in war, but it will defend itself to the utmost if attacked", <i>GHT</i>, 02/24/1942 5. "We need powerful armoured troops – Current defense problems on the Stockholm Congress", <i>GHT</i>, 03/24/1942 6. "Fanatical information in English newspaper about Sweden (incoming German invasion) – But official London knows nothing", <i>GHT</i>, 03/24/1942
07/15/1943 The end of German-Swedish transit agreement	<p>The end of German-Swedish transit agreement & Sweden notifies Germany that the agreement will be cancelled on August 15.</p> <ol style="list-style-type: none"> 1. "Crisis in Sweden, believes British correspondent – permittent traffic is again 'on the wall'", <i>GHT</i>, 07/31/1943 2. "Sweden decides to cancel the permittent traffic – Certain information in English press", <i>GHT</i>, 08/03/1943 3. "Transit consent and the war in Norway"- an article based on a book ("The Swedish people wonder," by Bertil Stålhane), <i>GHT</i>, 08/04/1943 4. "London: The permittent traffic suspension is notified to Berlin bluntly – The Swedish decision shows how the hearts of millions are liberated from the fear of Germany", <i>GHT</i>, 08/05/1943 5. "Permittent traffic stops as well as military transports – consensus between Swedish and German governments about decommissioning during August", <i>GHT</i>, 08/06/1943 6. "Sweden acted very late – the decision is no surprise to London", <i>GHT</i>, 08/06/1943, 7. "No masked permittent-journeys – German civilians may go through Sweden, but only after visa", <i>GHT</i>, 08/20/1943

The table summarizes the headlines and titles of main articles published by *Goetborgs Handelsoch Sjöfartstidning* (*GHT*) around key events for the existence of the state and of the capital market. *Goetborgs Handelsoch Sjöfartstidning* was an important daily newspaper that was published until 1973. Selected titles are used as a proxy for Swedish society's expectations. The dates are in American-style.

Media coverage in Sweden followed the Nordic foci of World War II: the Finnish-Soviet Winter War (November 30, 1939, to March 13, 1940) and the German conquest of Norway (April-June 1940). After Norway's surrender, Swedish acquiescence in the transit of "unarmed" soldiers through its territory became public knowledge (July 1940), even though it constituted an implicit violation of neutrality. By mid-1941 Sweden found itself in a "German sea", surrounded by Germany in Denmark, Norway and Poland and by Germany's ally Finland.

In June 1941, at the beginning of the German invasion of the Soviet Union, Sweden was asked to provide transit through its territory for a German infantry division and its associated matériel. This flagrant violation of neutrality has since been described as involving a potentially existential threat if Sweden had refused. The episode, dubbed the “Midsummer Crisis”, ostensibly gave rise to conflicts between various members of the Swedish government and the monarch. Historians today debate whether there truly was a crisis, given that acquiescence was inevitable, or whether the events were subsequently described as such in order to shield or, instead, to attack the position of various Swedish personalities. Simultaneously, the Finnish-Soviet Continuation War began on June 25, 1941. Press coverage followed these developments without explicitly alluding to an existential threat. Finally, as Allied military fortunes continued to improve, the Swedish Government notified Germany of the termination of the transit agreement on July 15, 1943.

Figure 4 presents price indices for the Swedish stock market (in USD and inflation-adjusted terms) as well as the 3% Swedish Consol bond over the period from February 1938 to August 1945.

Beyond the 1939 start of World War II in Europe, there are several periods that could be considered “existential” for the Swedish state and capital markets, namely:

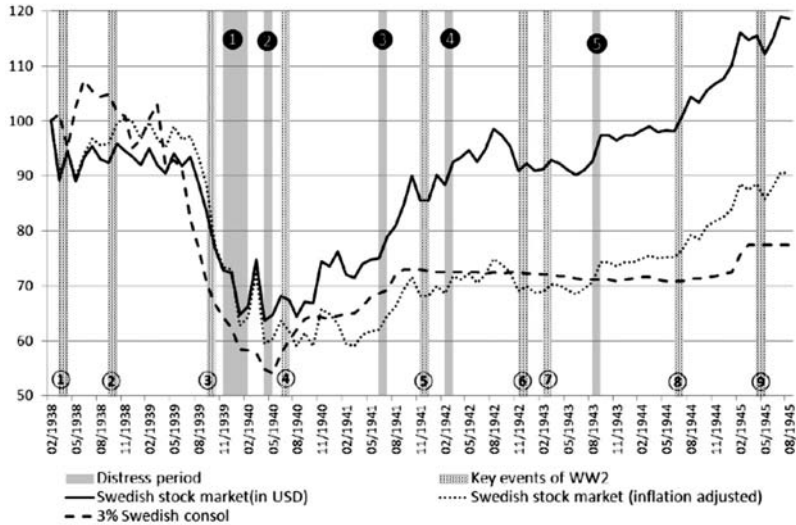
1. the Winter War of 1939-1940,
2. the Norwegian campaign of 1940, and
3. the “Midsummer Crisis” of 1941.

To its great advantage, Sweden managed to preserve its integrity, independence and civil rights throughout the Second World War.

The near-coincidence of the Winter War and Norwegian campaign did have a significant impact on Swedish capital markets. The stock market reached a low on April 30, 1940, after the beginning of hostilities in Norway, down 36.3% from its February 1938 level. Interestingly, and in contrast to other countries, the concurrent bond market decline was *greater*: 46%.

Given the controversy surrounding the Midsummer Crisis, it would be interesting to determine the Swedish stock and bond mar-

Figure 4
Performance of the Swedish stock and bond markets
(February 1938-August 1945)



The figure displays the performance of the Swedish stock and bond markets during the period between February 1938 and August 1945. The shaded areas correspond to periods crucial for the continuation of the local stock and bond market. The areas are numbered as follows (on top): 1- Soviet-Finnish war, 2- Norwegian campaign and German victory, 3- Midsummer crisis on transit of German war materiel/beginning of war between the Soviet Union and Germany supported by Finland, 4- February crisis of 1942 and mobilisation, 5- Cancellation of transit agreement. At the bottom of the figure key events for WW2 period are highlighted and numbered as follows: 1- Annexion of Austria, 2- Munich Accord, 3- German invasion of Poland, 4- German victory in of the Battle of France, 5- United States enters the war, 6- German setbacks at Stalingrad and El Alamein, 7-Germany's first major defeat- Stalingrad, 8- D-Day, the Allied invasion of France, 9-Germany surrenders to the Allies.

kets' reactions to it, but the monthly granularity of our data and the crisis's short duration (intra-June 1941) preclude this. Be that as it may, between May and July 1941 the stock market *rose* by 5.6%, an increase which may in part have signaled a relief rally. We find no evidence that capital markets exhibited significant worries about the event.

The survival of Sweden through World War II permits us to explore the performance of Swedish capital markets through the conclusion of hostilities in May 1945: After the above-noted 36.3% decline,

the equity market rose 76%, to end 12.2% above its February 1938 value. As for the bond market, although our benchmark bond never returned to par by May 1945, its price *leveled off* by August 1941 at 28% below its February 1938 value and subsequently gained 7.6% by the end of March 1945. We take the leveling off in value as possibly indicating a return to “normalcy” at a higher level of interest rates than in 1938; if so, it is interesting that this occurred as early as August 1941.

We extended the above analysis by searching for structural breaks. We found five for the Swedish capital market (see Table 7). In September 1939, the Swedish government bond proxy lost close to 10% of its value. In the same month, the stock market denominated in USD lost 14.0% and the inflation-adjusted index fell by 7.44%. The beginning of the Soviet-Finnish Winter War in November led to a break of -14.1%. Not surprisingly, the Swedish market experienced another structural break of -8.04% in April 1940, when the German invasion of Norway began. It is worth noting that the fall of France in June 1940 sent the USD-denominated stock index 7.52% higher. Our analysis of structural breaks allows us to take part in the debate on the importance of the Midsummer Crisis. We found a break in July 1941, when the Swedish market gained more than 6.5%. We interpret this as a positive reaction by the market to how the crisis was resolved or a reflection of whether it was a “crisis” at all.

3.6 *The United Kingdom, 1938-1945*

Under the leadership of Prime Minister Winston Churchill, the United Kingdom and its Commonwealth and Empire were the sole Western belligerents against Germany from the fall of France on June 22, 1940, until the German invasion of the Soviet Union exactly one year later. In 1937, under the previous prime minister, Britain’s military chiefs had warned the nation’s political leadership of the need to avoid the severe disadvantages of being the sole combatant against an array of adversaries. And yet, this is precisely the situation that Britain found itself in at the end of the Battle of France.

Since the United Kingdom was one of the Big Three that ulti-

TABLE 7
Detected Structural Break-Points together with Historical Events
for Swedish and British Capital Markets

Date	Bond market	Stock market (in USD)	Stock market Inflation-adjusted	Major events
Panel A: Kingdom of Sweden				
September-39	-9.76%*** (0.001)	-7.44%** (0.0203)	-14.06%*** (0.0024)	German invasion of Poland marks beginning of World War II
November-39	–	–	-14.00%** (0.0204)	Beginning of the Soviet-Finnish war, known as Winter War
April-40	–	–	-8.04%** (0.0465)	Norway capitulates to Germany
June-40	7.52%** (0.0170)	9.29%** (0.0158)	–	The Battle of France concludes with German victory
July-41	–	6.50%*** (0.0066)	6.70%*** (0.0060)	Midsummer crisis: Germany asks Sweden to allow the transportation of armed German troops
Panel B: United Kingdom				
September-38	–	-7.13%** (0.0178)	-6.73%** (0.0285)	Munich Accord: German annexation of the Sudetenland
September-39	-5.19%** (0.0170)	–	-8.17%*** (0.0037)	German invasion of Poland marks the beginning of World War II
June-40	–	-10.77%*** (0.0087)	-16.78%*** (0.0093)	The Battle of France concludes with German victory
July-41	–	9.78%*** (0.0055)	10.21%*** (0.0016)	German invasion of the Soviet Union

The table presents changes in the conditional mean, equivalent to estimation of parameter γ from equation (2). Panels A and B present structural break points for Swedish and British capital market, respectively. ***, **, * denote 1%, 5% and 10% significance level.

mately prevailed in World War II, both media reports and capital-market reactions help us grasp the situation as perceived by some of the players during this period. Table 8 presents headlines and ti-

titles of main articles in the *Sunday Times (ST)*, then and now one of Britain's leading papers.

TABLE 8
Headlines of Newspapers Around Events Crucial for Survival of British Capital Market

Date & Event	Description & Titles/Newspapers/Publication date
09/30/1938 Munich Accord	<p>The Munich Agreement permitted Nazi Germany's annexation of Czechoslovakia's areas along the country's borders mainly inhabited by German-speakers, a territory designated the Sudetenland.</p> <ol style="list-style-type: none"> 1. "Markets Governed by Politics", <i>ST</i>, 09/25/1938 2. "Money Market: Active demand for dollars; larger turnover of gold; discount rates higher", <i>ST</i>, 09/25/1938 3. "Italy and Germany United Against Democracies", <i>ST</i>, 09/25/1938 4. "Mussolini the Peace Maker", <i>ST</i>, 10/02/1938 5. "The Peace – and After: Outlook for European Settlement", <i>ST</i>, 10/02/1938 6. "How London Would Have Been Evacuated", <i>ST</i>, 10/02/1938 7. "The Outlook": The great relief that peace has been preserved has the amplest justification, and the Stock Exchange is likely to remain in a buoyant mood this week, <i>ST</i>, 10/02/1938
03/31/1939 British and French Guarantee to Poland	<p>United Kingdom and France pledged their support to guarantee Polish independence after the German invasion of Czechoslovakia.</p> <ol style="list-style-type: none"> 1. "The Outlook: Right to expect a gradual further growth of Stock Exchange business. For the moment, particular groups of securities are likely to be singled out for attention – possibly iron and steel shares..."; <i>ST</i>, 03/12/1938 2. "Shock to Market Confidence: Immediate Outlook Dependent upon Politics" – Disturbing events arose with SE; only small pressure to sell in last few days, <i>ST</i>, 03/19/1938
09/03/1939 Britain and France declare war on Germany	<p>Germany's invasion of Poland on September 1, 1939 began World War II.</p> <ol style="list-style-type: none"> 1. "While Parliament was passing the Emergency Powers (Deference) Act, the city was making its own preparations between peace and war", <i>ST</i>, 08/27/1939 2. "Parliament and the Crisis: All Parties Support the Government, <i>ST</i>, 08/27/1939 3. "1914 vs. 1939, Hitler & Stalin", <i>ST</i>, 08/27/1939 4. "Patriotism is the soul of a nation", <i>ST</i>, 08/27/1939 5. "Britain's Food Reserves Greater Than Ever", <i>ST</i>, 08/27/1939 6. "The City Prepares For War: How Supply of Credit is Maintained" – "The City and the country is in far better economic shape than in August 1914, and our economic strength will become more and more apparent with the passage of time.", <i>ST</i>, 09/03/1939
06/22/1940 French armistice	<p>Germany's victory in the Battle of France led to French capitulation.</p> <ol style="list-style-type: none"> 1. "Armistice Terms Signed: Fight Goes on Until Peace is Reached with Italy", <i>ST</i>, 06/23/1940 2. "Keitel's Tribute to French; The Fall of France: Will Resistance Go On?", <i>ST</i>, 06/23/1940 3. "How France Heard of Peace Move: People's Fortitude in Face of Defeat" – "France collapsed because of military and political reasons; England not the same, <i>ST</i>, 06/23/1940 4. "Pros and Cons of Invasion"- "The enemy will rely on fear, will attempt a blockade, and there will be an unknown political factor involved", <i>ST</i>, 06/23/1940 5. "Still Hope for the French Empire: Qualified Acceptance of the Armistice" – "If France goes on living an independent life in her overseas Empire...", <i>ST</i>, 06/30/1940

(continued)

(continued)

TABLE 8
Headlines of Newspapers Around Events Crucial for Survival
of British Capital Market

Date & Event	Description & Titles/Newspapers/Publication date
07/07/1940 Beginning of the Battle of Britain	<p>German Air Force launched its offensive against the United Kingdom in the summer of 1940.</p> <ol style="list-style-type: none"> 1. "Germans Admit RAF Successes", <i>ST</i>, 07/07/1940 2. "If Britain is Invaded", <i>ST</i>, 07/07/1940 3. "Some Problems of the Financial Front2 -"All war losses should be shared by the whole community", <i>ST</i>, 07/07/1940 4. "All In the Front Line Now: Are We Ready in Heart and Soul?", <i>ST</i>, 07/07/1940 5. "The Strategical Conditions of Invasion"-Possibility is there, but there will be much delay; handicap to success is severe because of need to launch two-pronged attack, <i>ST</i>, 07/07/1940
06/22/1941 German attacks on USSR	<p>Germany launches its invasion of the Soviet Union.</p> <ol style="list-style-type: none"> 1. "Axis Funds in US Frozen", <i>ST</i>, 06/14/1941 2. "The War's Ebb and Flow: Undercurrents in Our Favour", <i>ST</i>, 06/14/1941 3. "The Spirit of the People", <i>ST</i>, 06/14/1941 4. "Stream of Planes Over Atlantic: Astonishing Achievement of Ferry Pilots", <i>ST</i>, 06/22/1941 5. "The United States Preparing For War", <i>ST</i>, 06/22/1941 6. "Should Britain Increase Supplies?", <i>ST</i>, 06/22/1941 7. "Blow at Heart of Russia: Hitler's Aim in Moscow Drive", <i>ST</i>, 06/22/1941 8. "Smashing Invasion Plan and Aiding Russia", <i>ST</i>, 06/22/1941 9. "Hitler as Napoleon", <i>ST</i>, 06/22/1941
12/07/1941 Japanese attack on US naval base at Pearl Harbor	<p>As result of the attack United States declared war on Japan.</p> <ol style="list-style-type: none"> 1. "The Seesaw in Russia and Libya: German Army's First Major Defeat", <i>ST</i>, 12/07/1941 2. "What Japan Wants", <i>ST</i>, 12/07/1941 3. "War Must be Won In Germany", <i>ST</i>, 12/07/1941 4. "The United States: Preparing Huge Victory Production Plan", <i>ST</i>, 12/07/1941 5. "Driving Enemy from Philippines: Only One Foothold Left: US Fear Guam Has Fallen", <i>ST</i>, 12/14/1941 6. "World-Wide War: Balance of Victories and Defeats", <i>ST</i>, 12/14/1941 7. "Allies to Form a United Front: Pooling Resources of Men and Supplies", <i>ST</i>, 12/14/1941 8. "The Power of Darkness" – Japan's sudden and treacherous attack on the United States is one of the most momentous events in history, <i>ST</i>, 12/14/1941

The table summarizes the headlines and titles of main articles published by *Sunday Times (ST)* around key event for the existence of the state and of the capital market. The *Sunday Times* was one of the largest-selling British national Sunday newspaper. Selected titles are used as a proxy for society's expectation. The dates are in American-style.

As Table 8 shows, there was substantial initial relief at the outcome of the Munich Conference ceding the Sudetenland to Germany. It appears the *Sunday Times* recognized the seriousness of the progression to war in March 1939, as the United Kingdom and France extended guarantees to several countries, including Poland, in the

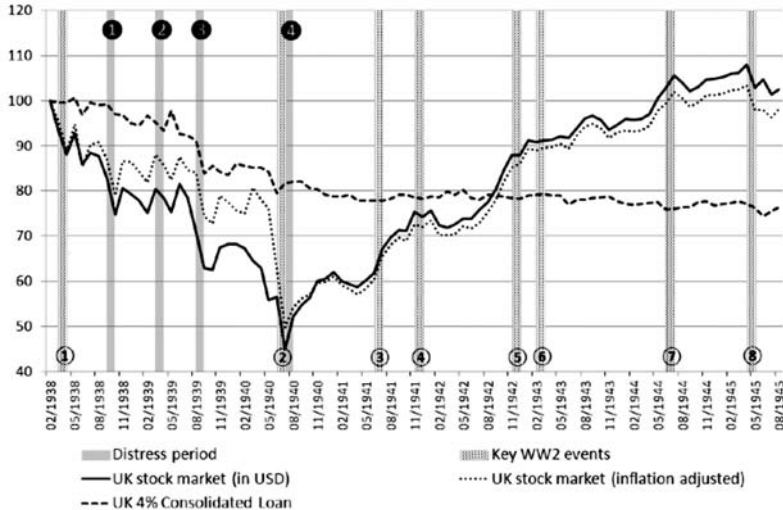
aftermath of Czechoslovakia's elimination. At this time, the paper refers to sector-rotation in the markets, towards the heavier "iron and steel shares." The September 3, 1939, declaration of war gave rise to favorable (from the British perspective) economic comparisons with August 1914. French capitulation in June 1940 sparked analysis of a prospective invasion, together with expressions of hope that French overseas territories would continue to resist. Naturally much attention then went to the critical Battle of Britain over British skies. On June 22, 1941, Germany's Operation Barbarossa brought the Soviet Union into World War II as a British ally, with the paper alluding to an "Ebb and Flow □ Undercurrent in Our Favor." The reports of December 7, 1941, focus on the Japanese attack on the U.S. Naval Station at Pearl Harbor and other Hawaiian military facilities, described as "one of the most momentous events in history."

The British capital markets serve as a most illuminating quantitative assessment of contemporary international events. Figure 5 presents price indices for the British stock market (in USD and inflation-adjusted terms) as well as the 4% U.K. Consolidated bond over the period February 1938 – July 1945.

We believe Figure 5 suggests the following conclusions and findings: The seemingly bullish outcome of the September 1938 Munich Conference did not produce a stock-market rally, this possibly being in part a consequence of the monthly frequency of our observations. The seven months preceding October 31, 1939, saw a decline of 22.2%. The all-time low for this period came on July 31, 1940, following the end of the Battle of France and the beginning on July 10 of the Battle of Britain. The index had declined 55.1% from its February 28, 1938, value.

The Battle of Britain is generally considered to have ended on October 31, 1940, by which time the index had recovered 25.7% from its July 31 low. The entry of the Soviet Union as an ally in June 1941 does not appear to have had an immediate positive effect on stock-market values, probably owing in part to initial Soviet setbacks, although the market did appreciate by 8.5% in July 1941. Perhaps surprisingly, the entry in December 1941 of the United States, of

FIGURE 5
Performance of British stock and bond market (February 1938-August 1945)



The figure displays the performance of British stock and bond markets during the period between February 1938 and August 1945. The dashed area corresponds to periods crucial for continuation of the local stock and bond market. The areas are numbered as follows (on top): 1- Munich Accord, 2- British guarantee to Poland, 3- Britain and France declare war on Germany 4- Beginning of the Battle of Britain. At the bottom of the figure key events for the WW2 period are highlighted: 1- Annexation of Austria, 2- German victory in of Battle of France, 3-Beginning of war between the Soviet Union and Germany 4- United States enters the War, 5- German setbacks at Stalingrad and El Alamein, 6-Germany's first major defeat- Stalingrad, 7- D-Day, the Allied invasion of France, 8-Germany surrenders to the Allies.

greater eventual impact on the U.K., failed to generate a significant positive return by January 31, 1942.

In early November 1942, British forces were on track to win in the second battle of El Alamein in Egypt, while Anglo-American troops landed in North Africa in Operation Torch. In recounting those two events in his speech at the Lord Mayor's Day luncheon on November 9, Prime Minister Churchill famously declared:

"Now this is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning."

As can be seen from Figure 5, the British stock market had continued an almost monotonic rise from July 31, 1940, and by November 30, 1942 it had gained 95.6%.

By May 31, 1945, the end of the month that brought V-E Day, the British stock market had doubled, with an increase of 129.2% relative to its July 31, 1940, value. The bond market's behavior was quite distinct. Although it too declined by 50.1% from February 1938 to May 1940, by August 1940 – two months before the end of the Battle of Britain – it had climbed back to 80% of its February 1938 value. Critically, the bond price stayed at that level for the remainder of the period (through the end of August 1945). Again, if we interpret that as the (possibly new) level of bond-market “normalcy,” the bond market returned to normalcy very early in the war.

Assuming bond prices reflected free-market operations and not stabilization policies by British monetary authorities, the behavior of the bond market appears to highlight the Battle of Britain as the point of Britain's maximal existential exposure.

The four-step procedure designed to detect structural breaks allows us to find four breaks in time series characterizing the U.K. capital market (see Table 7). Three of them coincide with key historical events such as the Munich Accord (September 1938), Germany's invasion of Poland (September 1939) and the Franco-German Armistice (June 1940). The remaining break we detect occurred in July 1941, just one month after Germany launched its offensive against the Soviet Union. The estimation of equation (2) shows that the U.K. equity market slumped by around 6.7% in September 1938. At the same time, the *Sunday Times* reported high demand for gold and U.S. dollars, indicating uncertainty among market participants. September 1939 brought another break in U.K. time series: Germany's attack on Poland and the French and British declarations of war on Germany. Those events sent the U.K. bond benchmark and inflation-adjusted stock index down by 5.19% and 8.17%, respectively.

The Franco-German armistice signed on June 22 marked Germany's victory in the Battle of France. In that month, we detected a structural break: the inflation-adjusted benchmark fell by no less than 17%, while the USD denominated index went down by nearly 12%. Plainly, the defeat of France together with the need for Dunkirk evacuation sent very negative signals to British investors.

The last U.K. structural break during WW2 was detected in July 1941. The value of the stock market rose by 9.78% in USD and 10.21% on an inflation-adjusted basis. The stock market rally can be attributed to the fact the United Kingdom gained an ally in the East when Germany invaded the Soviet Union in June 1941 in Operation Barbarossa, ending the period when the United Kingdom was the sole European country at war with the Third Reich.

3.7 *Raw Returns or World Market-Adjusted Excess Returns?*

Before we summarize the results of this section, it is important to discuss whether the results we report simply reflect substantial price fluctuations in U.S. or global markets. Given the very substantial pressure under which our four countries labored in this period, that is *a priori* unlikely. Nevertheless, we undertake this analysis by considering the returns of each of the four countries in excess of our global market return, essentially positing a beta of unity on the world market portfolio.

The results of the analysis of stock market performance in excess of our global market return are presented graphically in Figure 6.

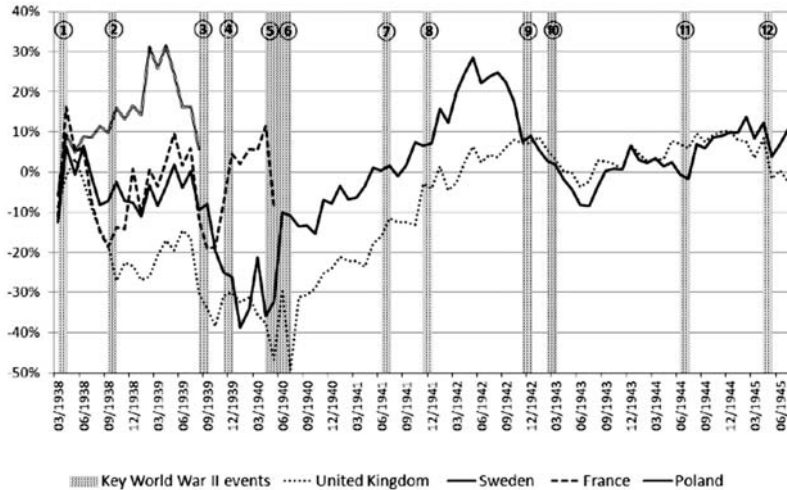
The conclusions we glean from this figure are as follows. For the U.K. and Sweden, it would appear the results bear out the country-specific nature of stock-market returns: while the country was under pressure, its stock market underperformed; as the pressure was relieved (August 1940 for the U.K. and January 1941 for Sweden), its stock market recovered. As previously stated, there is no empirical evidence of a Swedish 1941 "Midsummer Crisis."

For France, there was a crisis in September 1939 with the outbreak of hostilities and at the end of Third Republic, but arguably the market did not have a sense of what the 1940 armistice forebode.

Polish stock-market behavior appears to indicate little impact of the April abrogation of the non-aggression pact, whereas there was some impact of the imminence of hostilities in 1939.

For these four countries, stock and bond markets reflected the two periods of September-October 1939 and April through July 1940

FIGURE 6
 Cumulative abnormal returns for the British, French, Swedish
 and Polish stock markets (February 1938-August 1945)



The figure displays cumulative abnormal returns for the British, French, Swedish and Polish stock markets during the period between February 1938 and August 1945. The abnormal return is defined as the difference between the monthly return of each of these four stock markets and the global market return. The shaded areas correspond to periods crucial for the advent and outcome of World War II. They are numbered as follows: 1- Annexation of Austria, 2- Munich Accord, 3- German invasion of Poland, 4- Soviet-Finnish war, 5- Norwegian campaign and German victory, 6- German victory in the Battle of France, 7-Beginning of war between the Soviet Union and Germany, 8- United States enters the War, 9- German setbacks at Stalingrad and El Alamein, 10-Germany's first major defeat- Stalingrad, 11- D.Day, the Allied invasion of France, 12-Germany surrenders to the Allies.

as those of maximal exposure. As things turned out, Poland succumbed in October 1939 (event no. 3 in the figure) and France in June 1940. Sweden and the United Kingdom, though under intense pressure, especially in the latter period, prevailed through the crisis (these were events 5 and 6 for the Norwegian campaign and the Battle of France; see corresponding figures).

These results are consistent with Berkman, Jacobsen and Lee (2011), who conclude that increases in crisis probabilities have a significant negative impact on stock prices.

3.8 Summary

In a free-market economy, the value of the stock market at any point in time represents the present values of expected cash flows accruing to stockholders, discounted at the appropriate risk-adjusted discount rate. In general, of course, these will be impacted by myriad political, economic and financial considerations. In examining four national stock markets before and during World War II, we posit an *ex-ante* single-minded focus on the survival of the national body politic as then constituted, and the preservation of civil and human rights that permit stockholders to enjoy the fruits of their investments. Given the events that gripped the continent of Europe from the establishment of the Nazi regime in March 1933, the remilitarization of the Rhineland in March 1936 and especially the Austrian *Anschluss* of February 1938, until the declaration of war in September 1939, we feel this is a reasonable hypothesis.

1. That said, we attempted to discern whether stock and bond markets were able to anticipate the potential loss-of-sovereignty “apocalypse” during the Second World War. Any conclusion with respect to the informational efficiency of capital markets must perforce face the distinction between *ex-ante* and *ex-post* realizations. For the two countries that succumbed during World War II, Poland and France, it is fair to say that their respective stock markets had no inkling of the *ex-post* likelihood and implications of military defeat. Polish capital markets declined by 23.2% and the French market by an almost identical 22.9% from their February 1938 levels. In the event, *ex-post* Poland did not return to capital markets for over half a century, and both countries suffered considerably before regaining their sovereignty.
2. For the events facing Sweden during the time of the so-called Midsummer Crisis of June 1941, we applied the methodology of retrieving stock prices to quantify the effect of that crisis. As noted above, we find no discernible evidence of such a crisis in prevailing Swedish equity prices.
3. We do think it is important to note what appears to be “learning”

on the part of equity markets in the United Kingdom and Sweden in light of the previous events in Poland and France. The dissolution of Poland and the armistice in France highlighted the difference between those geopolitical events and their 19th- and early-20th-century precedents, and were reflected in the bond and equity markets.⁹

4. For the two countries that remained intact, the peak-to-trough decline was 36.3% for Sweden and 55.1% for the United Kingdom. The trough for both countries does appear to be the moment of greatest exposure, falling somewhat coincidentally at roughly the same time:
 - a) for Sweden, the April 1940 German invasion of next-door Norway;
 - b) for the United Kingdom, the June 1940 end of the Battle of France, which left the United Kingdom and its Commonwealth as the sole Western belligerents.

For both countries, the changing fortunes of military engagements subsequently revived their domestic stock and bond markets.

4. Conclusions

This paper has examined the performance of stock and bond markets in the face of national existential threats that have the potential to wipe out the entire value of the investment. Existential jeopardy of this kind can arise from external threats, e.g. invasion by a foe, or from a domestic threat to a free-market economy, such as that of a change of regime to command-and-control. In this respect, the experience of the Polish and French markets may have been *learning experiences* for the subsequent U.K. and Swedish markets. The paper links the sentiments expressed in public media at

⁹ In private correspondence, several colleagues have alluded to the fact there were historical precedents for France being invaded by Germany: 1870 and 1914. With all due respect, let us point out that these analysts fail to distinguish between the Bismarckian and Wilhelmine regimes on the one hand and the nature of the German regime in 1939.

the time to the performance of these nations' bond and stock markets.

Clearly, *ex-post* realizations are always imperfect tests of *ex-ante* expectations. Thus, to the perennial question, "How well do markets assess such risks?," the Polish and French markets, which succumbed to the external threat, do not appear to have reflected the *ex-post* realization of market closures. In this regard, our findings are in contrast to the graphical representation in Jorion and Goetzmann (1999; their Figure 2) which appears to suggest a monotonic decline up to their self-described "permanent closure." The two markets that were able to maintain continuity, the British and Swedish markets, did appear to recognize the point of supreme risk prior to their subsequent recovery.

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