

Switzerland during the Great War: Neutral, yet threatened? A view from the sovereign bond market.

Christoph Schaltegger¹, Lukas Schmid²

14th December, 2014

Abstract

This paper complements the previous research on Switzerland's exposure to military and political threats during the Great War with the aid of a structural break analysis of Swiss government bonds. The question whether Switzerland was acutely menaced during the war has led to a controversy among historians in the past although Switzerland was exposed to both military hazard by the war parties and the most serious domestic turmoil in the history of the Swiss federation at the end of the war. More recent studies, however, support the proposition that Switzerland was indeed endangered. The bond yield analysis reveals a picture which matches these studies: Switzerland was particularly threatened at the outbreak of war, repeatedly during the winter months as well as at peak of the general strike. In contrast, public scandals such as the trial against two colonels and the solo peace effort by Federal Councilor Hoffmann were not considered a threat to the country by the markets.

I. Introduction

In his recent best-selling book 'The Sleepwalkers' Christopher Clark (2012) challenges the widely held view among historians that the Central Powers, and in particular their biggest aggressor, the German Empire, are to be blamed for the outbreak of the First World War. While he partly unburdens the German leadership of some of its blame he sees the most prominent cause of war as the mutual unwillingness of the Great Powers to give up their military ambitions. In addition, he argues that the statesmen of the opening 20th century lacked the ability to a change in perspective and to reflect the consequences of their actions on other countries.

While Clark's analysis offers a new perspective on the causes of the World War One (WWI) and its perpetrators – just in time for the Great War's centennial this year – the fate of neutral countries during the seminal catastrophe of the 20th century has received little

¹ University of Lucerne, Switzerland.

² University of St. Gallen, Switzerland.

attention. Located in the very center of Europe, Switzerland was one of the only neutral countries to be completely surrounded by warring parties – the Netherlands being the other country in a similar position during WWI. Did Switzerland escape the horrors of the trenches due to pragmatic decisions by its political and military leaders or simply by favorable fortune? This paper further aims to shed light on the question of whether Switzerland's political and military position during the years of war even so far as to put the country in immediate danger of being invaded. Additionally, was its declared neutrality in danger of being ignored by one of the belligerent countries? How was the public perception on the risk of war?

This is more than a conventional event study. The goal is to shed light upon the aforementioned queries by analyzing the price movements of Swiss sovereign bonds which mirror the risk assessment of contemporary market participants with regard to the default probability of the debtor, the Swiss government. The resulting yield estimates are matched with corresponding war events in order to examine whether the threat assessments of historians in retrospect and in contemporary market actors coincide. New insights may be obtained by this approach to determine the threat of being involved in the war. Evaluations suffering from ideological insinuations or pure misjudgments can be reduced significantly as the results are based on decisions of investors who took substantial financial risks. Thus, they had clear incentive to assess the risks of war objectively. Due to the multitude of investors it can furthermore be assumed that information processing constitutes a more representative picture of the degree to which Switzerland was threatened than a conglomeration of individual statements. In addition, this alternative approach allows for an assessment of whether standard historiography withstands the challenge of less orthodox methods.

So-called structural break analyses have been conducted in numerous studies in order to identify essential alterations in securities and exchange rate market data for the purpose of evaluating the threats of war for specific countries as well as eras. Willard, Guinnane and Rosen (1996) pioneered the application of this method through their study of the American civil war by analyzing the exchange rate fluctuations between gold and "Greenbacks" – a currency issued by the Union that was solely backed by the credibility of the government. They found that opinions of financial markets were not always consistent with conventional historical sources. Kucher & Frey (1998) and Frey & Kucher (2000) estimated the threat of war for Switzerland for the first time based on bond market data at the Zurich stock exchange in the stretch of 1928 until the end of World War II. Their results indicate that contemporary market actors' investment behavior and historiography coincide with the significance attached to many events before and during the war. Waldenstörms & Frey (2007) considered the question of whether Scandinavian bond markets recognized the martial tempest of a German invasion at the end of the 1930s. According to their findings the

perception of war risk increased significantly for many, though not all, major war-related events³.

In contrast to the growing interest in studies investigating into the effects of political change by means of financial market data that has produced a considerable number of studies with a particular focus on World War II the developments around WWI have received little attention. The handful of studies examining the events of the 1910s focused on the war's outbreak in July 1914, as it marked a turning point in world history of such a great extent. For Ferguson (2006), the London bond market serves as a prime example of how market actors failed to grasp the risk of war in the weeks after the assassination of the heir apparent to the Austrian-Hungarian throne, Franz Ferdinand, and his wife. While Ferguson's conclusion – that is, that the diminishing sensitivity of the bond market to political events offers a considerable part of the explanation of why investors did not anticipate the outbreak of the war – constitutes an interesting and useful finding for this paper his study deviates considerably from ours with regard to the methodology applied as he relinquishes a complete empirical analysis of the price data.

Our dataset consists of daily sovereign yields from the Basle, Geneva and Zurich stock markets, quoted from 1914-1918. In detail it is composed of the four *federal government bonds* (Eidgenössische Anleihe) traded at that time as well as the nine *mobilization bonds* (Mobilisationsanleihe) both issued by the Swiss Confederation – the major share of the war-related financial needs of the state. In contrast to World War II the general market situation proved to be rather difficult. The shock of the war's outbreak lead officials in all of Europe to close their trading centers in order to suppress a further increase of the panic that had spread rapidly through the financial market community. The Swiss stock exchanges in the German speaking part of the country (Basle, Bern, Zurich) stopped trading as well, whereas markets in Geneva and Lausanne remained open, although trading activities almost halted completely during the first months of the war. Despite these difficult circumstances the important stock markets in Basle and Geneva returned to regular activity and volumes from the beginning of 1915 onwards and also proved to be resistant to other challenges such as the reflow of Swiss securities from abroad. The bond market in Zurich did not catch up until mid-way through the war due to liquidity problems. All in all the Swiss bond market maneuvered well through its demanding market environment and therefore the assembled data suffices the essential quality standards with regard to consistency as well as trading frequencies (Schweizerische Nationalbank [Swiss National Bank], 1944). In order to estimate the structural breaks in the bond yields we apply the method of Bai and Perron (1998, 2003, 2006) that identifies breaks endogenously.

The remaining sections are organized as follows: Based on the most relevant historic sources Section II reviews key war events in Switzerland's history in order to present a current

³ Further considerable studies include Brown & Burdekin who examine the American Civil War (2000) and World War II (2002) from a British perspective. Oosterlinck (2003) investigates the French bond market during existence of Vichy France.

evaluation of the decisions of market participants and public perception at the time. Section III outlines the financial market environment in Switzerland prior to and during the Great War and offers a more profound discussion of the dataset and associated challenges. Section IV examines the econometric methodology and in Section V the results are presented.

II. Literature review

This section aims to describe the events that changed public sentiment in Switzerland on how vulnerable the country was during the war. As in the case of most countries, Switzerland's historiography on the Great War is not as large as that of World War II. However, we have scanned most of the academic writings that cover Switzerland during World War I and therefore believe to be able to offer a rich summary of historical information on this topic.

From the outbreak of WWI to Italy's entrance into the Entente in May 1915

According to Fuhrer (2003) Switzerland's war chronicle can be split up into four periods in which the country was exposed to military and political threats in different ways. The first period stretches from the outbreak of the war until May 1915, when Italy eventually left the Triple Alliance and joined the Triple Entente. From a military perspective it is considered the most uneventful period of the war as a German attack on France was widely expected to happen through Belgium due to much more favorable topographic conditions (Fuhrer and Olsansky, 2008)⁴. Among the population, however, the outbreak of the war created widespread fear and uncertainty as to whether the country would be drawn into the conflict. This reaction somewhat contrasted with the prevalent rhetoric during the years prior to the war during which there had been a tendency to conjure up a future war among the great European powers – a paradox that prevailed throughout Europe. (Mittler, 2003). The Austrian-Hungarian ultimatum on July 24th, 1914 also caused extensive bank runs all over the country which resulted not only in closed stock markets by the end of the month but also to several poor monetary policy decisions by the Swiss National Bank (SNB) (Ruoss, 1992). The outbreak of the war also set the tone for a domestic conflict that would not diminish until the worsening of economic and social troubles in the second half of the war. The sympathies for the warring parties ran right along the linguistic boundaries: The Latin speaking parts in the West and the South were fierce supporters of France and its Allies while a majority in the German speaking part supported the Central powers. The resulting national tensions were particularly widespread within the political elite, the press as well as among the educated middle class. National solidarity was threatened in particular during the beginning of the war.

⁴ The Italian armed forces produced some „operational sketches“ drawing up a few possibilities to attack Swiss territory. The sketches lacked any political acceptance among the other members of the Triple Alliance which is why they were never implemented (Fuhrer, 2003).

From Italy's entrance into the Entente until the "colonel's affair" in Winter 1915/1916

Italy's entrance into the war on May 23rd, 1915 marks a significant change in Switzerland's exposure as the country now found itself surrounded by warring parties⁵. While the increasing sphere of influence by the Allies had some obvious military implications its predominant effect was that it essentially changed Switzerland's economic position as the new constellation allowed the Entente to make harsh economic demands in its favor. The foundation of the Société Suisse de Surveillance Economique (SSS) in November 1915 enabled the Allies to impose direct control on goods traffic by forcing Swiss exporters to prove the neutral origin of their merchandise. The SSS also monitored the utilization of imports by prohibiting any exports to the Central powers. By establishing the Treuhandstelle Zürich (STS) the Central powers tried to influence the goods traffic in their favor as well. While they defended their interests as determined as the members of the Entente it became obvious that due to their geographic position and maritime inferiority they were more likely to win the war on the battlefield than based on an economic blockade. The knock against Switzerland's economic sovereignty provoked some voices to demand the country's entry into the war in order to improve its supply situation by force⁶. In contrast to the public debate on Switzerland's international economic relations in August 1915 this discussion was mainly limited to diplomatic circles. Public sentiments with regard to the new economic dependencies differed along the familiar lines of the linguistic boundaries. Both sides feared the Federal Council had given in to the demands of the wrong party thus endangering the country's independence (Ehrbar, 1976).

During the second half of the year 1915 the focus shifted to the events on the battlefield as the scene on the Western front was moving much closer to the Swiss boarder. No side, however, managed to overcome the trenches in Alsace and achieved a breakthrough resulting in the military strategist on either side beginning to draw up scenarios for an advantageous shift. While the Germans were contemplating a diversion and attack on the fortress of Belfort that would force the French to deploy troops southward, France developed operational plans to bypass the Western Front through Swiss territory – the so-called "Plan H" (Fuhrer and Olsansky, 2008)⁷. For several reasons the result of these studies was negative: the French army command doubted the capability of road and rail in the Jura which would undermine the attack's element of surprise. As a result the Germans could start a counterattack that was likely to lead to nothing but an extension of the Western front through Switzerland, which in turn would require more British resources along the front. Clearly the wider public remained unaware of the plans until decades later. At the beginning

⁵ In addition, the diplomatic relationship towards Italy was not very intense and was not based on an attitude of mutual respect (Fuhrer, 2003).

⁶ One but important example is the so-called "Säbelrasslerbrief" by supreme commander General Wille who tried to convince the Federal Council for an entrance into the war by resigning from the neutral position on 20 July 1915 (Röthlisberger, 1975).

⁷ The German plan to attack Belfort was never implemented due to the Allies' offensive in the Artois and Champagne region at the end of September 1915.

of the winter its eye was invariably focused on the military successes of the Central powers on the Balkan. The conquest of Serbia on 5 November 1915 allowed the Germans to deploy troops to the Western front – a fact that stirred up the old fear among the Swiss public of being drawn into the war.

The beginning of 1916 brought the revelation of perhaps the most serious domestic crisis of the entire war. Known as the *colonels affair* (Oberstenaffäre) (Fuhrer, 2003; Schoch, 1972), in mid January the public was informed that two general staff officers had deliberately sent the general staff news bulletins as well as to a substantial extent allied intelligence to the representatives of the Central powers in Switzerland. Although quite a few press agencies refrained from criticizing the Federal Council and the Army command public outrage was vast – even in circles that were usually loyal to state institutions. It was the attempt to conceal the affair by the army command by posting the two colonels that was deemed unacceptable. In socialist circles and in the Romandy the handing over of intelligence was considered an act of high treason (Schoch, 1972). The following trial in front of a military court ended in an acquittal for the accused officers⁸. However, the court advised the army command to take disciplinary action. The supreme commander General Wille met this demand by ordering 20 days of detention and discharged the officers from their posts. Although it was acknowledged that these measures helped to calm public anger to a certain extent it did not close the division between German and Latin speaking regions as the officers were expected to be sentenced to imprisonment in many places. This was especially so in the Romandy where mistrust towards the army command reached an irreparable peak at the beginning of March 1916 when plans were published to mobilize troops for the purpose of restoring order in case of riots after the pronouncement of the acquittal. Except in socialist groups the army command could still rely on substantial support in German speaking Switzerland. Yet the fact that criticism against the army was no longer frowned upon weakened the army's position considerably.

The fact that the *colonels affair* went up as high as the leading level of the Swiss army raised serious questions about Switzerland's neutrality with the Allies. Would Switzerland provide the necessary protection of the flank in case of a German attack circumventing the Western front in the South? Extended activity of espionage on Swiss territory throughout the winter of 1915/16 indicates how little trust the French had in the Swiss promise to uphold its neutrality and its defensive capability (Fuhrer, 2003). The scandal involving the two general staff officers, however, arrived at an opportune moment for the Allies as the major consequence for Swiss foreign policy was the need to actively demonstrate the credibility of

⁸ There are two main reasons that led to the acquittal of the officers: First, the prosecution failed to prove the transfer of Russian telegrams to the Central powers' representatives as its main witness was not fit to testify in court. Second, the general chief of staff, Sprecher, protected his subordinates by justifying the procurement of intelligence as a countermeasure against the violation of Switzerland's neutrality by the Allies' economic blockade. The court weighted Sprecher's plea for his subordinates significantly higher than the violation of the country's neutrality by the officers (Schoch, 1972).

the Swiss neutrality⁹. Both sides were therefore keen on establishing more trustworthy relations. As a consequence of these mutual dependencies France and Switzerland would come closer over the following years in particular with regard to military cooperation in case of a German attack through Swiss territory. Throughout 1916 the public continued dwelling on the role and strength of the army. Public doubts about the army's inner unity and ability to defend the country were greatly simplified by different faux pas by high army representatives. In combination with the fact that the implications of the country's economic situation were felt among larger shares of the population the aversion to the army caused the first large public anti military protests. In addition, the public in German speaking Switzerland had grown more skeptical of the Central powers. Growing border violations, the unrestricted submarine warfare and reports about the oppression of the civilian population in occupied territories harmed the Central powers' reputation substantially (Mittler, 2003). The widespread pro-German attitude within the army's high ranks helped to justify the angry attacks against the army from the protesters' viewpoints (Fuhrer, 2003).

From the German's attack on Verdun until the remobilization of the Swiss Army in February 1917

The Germans attack on Verdun beginning in February 1916 brought some relaxation of the military threat against Switzerland since the French "Plan H" became most unlikely. However, the situation changed again during the course of the year and with military standoff at Verdun front. Even though the protesters in Switzerland pursued widely accepted and legitimate social and pacifist goals they lead to new doubts about the credibility of the Swiss neutrality as their leftist slogans did not match the Allies' picture of a stable state. These signs of weakness led the Allies in November 1916 to conclude that the scenario of a German attack through Switzerland must not be ruled out (Mittler, 2003). Following the French and Swiss press in mid December such an assault was to be launched shortly. Parallel to the year before the Germans had just finished a campaign successfully – Romania's fate had been sealed with the conquest of Bucharest on December 6th, 1916. The fear of an attack through Swiss territory was based on more available resources for the Western front and a series of articles in Swiss and French newspapers claiming the German readiness to interpret another violation of neutral territory as a mere military necessity because the Allies had ignored the Central powers peace offer earlier in December¹⁰. French demands to protect the boarder in the Jura region against a German attack stirred up a downright "warphobia" from Geneva to Basle. In addition to the alleged military threat, pessimistic predictions about the implications of economic sanctions against the Central powers on the shoulders of neutral Switzerland agitated the public (Mittler, 2003). The Federal Council and the army command tried to resist the reports and rumors vehemently in

⁹ In addition to the scandal involving the general staff officers the difficulty of the German undertaking at Verdun caused Bern to pursue better relations with the Allies as the country relied on economic concessions by the Allies to reduce its economic difficulties that were mainly due to a negative barter trade balance with the Central powers.

¹⁰ On December 12th, 1916 the Central Powers published an unconditional peace offer without presenting any concessions. The Entente eventually declined the offer at the end of December.

public and were eager to assure that Switzerland would oppose a circumvention of the Western front through its territory by any means necessary¹¹. News of French troop movements along the Jura border at the end of December complicated this task substantially. The official response from Paris – that the troops were on their way to a relaxing accommodation – was met with relief in the Swiss public. In reality, the French general staff had had trouble assessing the real threat coming from the availability of additional resources by the Germans and had taken precautionary measures to defend its territory. Nonetheless the Federal Council felt obliged to send a sign of strength by ordering the mobilization of two additional divisions in February 1917 (Fuhrer, 2003).

From the US entry into war until the Russian October Revolution in November 1917

The last 18 months of the war mark a period of domestic difficulties in which Switzerland continued to struggle for credibility regarding its neutrality and its military strength. Federal Councilor and Minister of foreign affairs Hoffmann's endeavors for peace in the early summer 1917 constitute another delicate affair that provided Switzerland with undesirable attention. After the overthrow of the tsar in February Hoffmann believed a separate peace between Russia and the Central Powers in the East was possible. He advised the leading Swiss socialist Robert Grimm, who travelled to Petrograd in May 1917 to find out whether his services as a neutral intermediary were requested. Grimm informed the Minister in late May that the provisional government was considering to end Russia's military operations due to the strong opposition against the war among the Russian population. The government was leaning towards a separate peace despite its general loyalty to the alliance with Britain and France. According to Grimm only a German offensive along the Eastern front could halt the peace process. After consulting with German representatives in Bern Hoffmann sent Grimm a telegram stating that no German attack was to be expected (Mittler, 2003). That message was intercepted and made available to different press agencies worldwide. Shortly after the publication Hoffmann resigned on June 18th from his post. The outrage about Hoffmann's effort was particularly strong in France and Great Britain where the public was convinced there was a silent majority in Switzerland supporting the Central powers although Hoffmann denied having acted out of sympathy with Germany. In Switzerland Hoffmann received very little recognition as well. Those who had thought of him as a liability owing to his former business activities in Germany saw his act as a confirmation of their suspicions. And those who had held him in high regard were astonished about his partnership with Robert Grimm (Schmid-Ammann, 1968). The outcry about the scandal was particularly loud in the Romandy and led to newly growing tensions among the Swiss regions. In contrast to prior domestic disputes the political elite did not join in. The Parliament voted for the president of the International Committee of the Red Cross, Geneva native Gustav Ador to be Hoffmann's successor – a measure which helped to

¹¹ For example, the most influential Federal Councilor Hoffmann gave several interviews with the quote: "If you believe that we would not oppose a German bypass through Swiss territory, you do not understand the more than 600 year old history of Switzerland" (Fuhrer, 2003, p. 459).

smoothen the gap between the regions substantially as his election significantly increased trust in the Federal Council in the Romandy (Ruchti, 1928).

Although the pre-peace period in 1917/18 was dominated by domestic difficulties public perception of the potential threat towards Switzerland was also guided by the changes in the compilation of the Allies. The United States entry into the war in April 1917 was received with doubts about whether they would respect Switzerland's neutrality (the formal guarantee to respect it was not given until the end of November 1917) and whether it would complicate the provisioning of the country in relation to US imports, which had grown fourfold during the war. All in all the Swiss public was relatively unmoved by the United States entry. The revolutionary developments in Russia in November 1917 had stronger impacts as the labor movement had grown significantly during the war due to the growing social evils (Führer, 2003).

From the beginning of severe domestic social tensions to the General strike in November 1918

What began with several large public demonstrations in the summer and fall of 1917 resulted in the country's most severe event concerning domestic affairs in the history of the Swiss Confederation, the general strike (Landesstreik) in November 1918. The strike was the result of the collapse of the social balance. The implications of the war – in particular the deviation of the price increase and wage adjustments – caused a majority of the population to experience severe economic difficulties (Tanner und Studer, 2012). In the opinion of the workforce all state institutions stood idly by the economic misery as they were focused on serving the bourgeois interests (Gautschi, 1988). While this reproach partly fails to recognize the fact that the government had sympathy with many requests of the population, it is true that the state failed miserably in the provision of the country. It was both inexperienced and unprepared to ensure the well being of the population over a longer period of time¹². The opening up of new sources of revenue by the state in the form of direct taxes constituted a further burden on the shoulder of the many citizens. The lack of public unemployment insurance and substitute income deteriorated the situation in many levels of society. The bourgeois views on the months prior to and the general strike itself deviated vastly. The efforts of the labor movement to gain attention were unilaterally condemned as attempts to overthrow public order and polity even though a large majority of the leftist groups did not sympathize with the Marxist concept of a revolution (Gautschi, 1988, Halbeisen & Straumann, 2012).

Although most demonstrations did not degenerate into street riots, they were regularly accompanied by violent outbursts. Yet until November 7th, 1917 none generated nationwide

¹² Like in many other countries the conviction that a future war would occur following the example set by the Franco-Prussian War in 1870/71 also prevailed in Switzerland. Therefore the authorities did not feel it necessary to lay in a grain supply over a period of 60 days and longer (Ochsenbein, 1971).

attention. The celebration of the Bolshevik revolution by ultra leftist groups in Zurich resulted in a riot in the course of which four protestors were killed (Mittler, 2003). Despite continuously growing tensions between the workforce and the bourgeoisie throughout the following months public order remained intact. The final rift of the social balance took place during the summer of 1918 after a further worsening of the economic misery had produced many local strikes. At the first Swiss Worker's Congress at the end of July in Basle the Acting Committee Olten (OAK) was officially entrusted with the task of setting the basis for organizing a general strike. Bourgeois circles considered themselves in the midst of a class struggle although no strike was proclaimed. They failed to recognize that the demands made by the labor movement constituted a call for an improvement of material and political positions rather than revolutionary purpose (Sprecher, 2000). The nationwide strike began on November 11th, 1918 after a one-day protest strike two days before. The troops already mobilized by the Federal Council at the beginning of the month were deployed to the largest centers in the country. An estimated amount of 250'000 workers followed the call for the strike which eventually lasted only three days. The bourgeois majority in Parliament requested the Federal Council to direct an ultimatum to the OAK to which the Committee acquiesced. Over all the strike was not successful enough to take the risk of to let the ultimatum pass as the support of the work force in the Latin speaking regions was almost non-existent. They preferred to celebrate the Allies' victory as the Committee leaders were suspected to be cooperating with the German socialists (Gautschi, 1988).

Table 1: Risk perceptions in Switzerland to be involved in WWI, 1914-1918

Historical event	Date	Threat / Source
Outbreak of the war (Assassination of Austro-Hungarian heir Franz Ferdinand, July crisis, foreign declarations of war, Mobilization of the Swiss Army, Election of the supreme commander)	28 June 1914 – 4 August 1914 (Begin of foreign declarations to respect Swiss neutrality)	Increase / neutral
Entry to war of Italy on the side of the entente (London treaty, declaration of war against Austria-Hungary)	26 April 1915 – 23 May 1915	Increase
„Säbelrasslerbrief“ by supreme commander General Wille for the Federal Council (Necessity that Switzerland enters the war and resigns from neutrality)	20 July 1915	Increase
Plans by the French high command to bypass the Western front through Swiss territory	18 November 1915 – 17 February 1916	Increase
<i>Colonels affair</i> (Violation of neutrality by passing confidential bulletin information to the Central powers)	8 December 1915 – 28 February 1916	Increase
Begin of German attack at Verdun	21 February 1916 – 20 December 1916	Decrease
Affair de Loys (Domestic suspicions against Swiss army)	3 September 1916	Increase
„Warphobia“ (internal affairs in Switzerland as a signal of weakness to sustain neutrality, which provoked plans to bypass the Western front through Swiss territory once again)	13 December 1916 – 28 December 1916	Increase
Mobilization of parts of the Swiss Army	13 January 1917	Decrease

Entry into the war by the USA (fear that USA would not respect Swiss neutrality; Guarantee of neutrality declared by USA on 27 November 1917)	6 April 1917 – 27 November 1917	Increase
Grimm-Hoffmann affair (Failed peace intermediation between Russia and Germany; Violation of neutrality against Entente; Demission of Federal Councilor Hoffmann on 19 June 1917)	26 May 1917 – 19 June 1917	Increase
Election of the liberal Gustav Ador from Geneva into the Federal Council	26 June 1917	Decrease
Social tensions and riots (Inflation and shortage of nutrition)	30 August 1917 – 7 November 1917	Increase
October Revolution in Russia and cease-fire with Germany (Peace of Brest-Litowsk which increased danger of southern bypass of the Western front)	7 November 1917 – 3 March 1918	Increase
Secret agreement with France (Chief of Staff Sprecher und General Paulinier agree on a de facto defensive standby)	30 December 1917	Decrease
First common reunion of socialist labor movements (split of the Swiss society with increasing social tensions)	27/28 July 1918	Increase
German High Command sees war as lost (Request for peace towards US-President Wilson)	29 September 1918 – 4. October 1918	Decrease
Ceasefire (Breakup of Austria-Hungary 28/29 October; November Revolution in Germany on 3 November; Flight of the German Kaiser Wilhelm II on 9 November)	11 November 1918	Decrease
General strike (Landesstreik)	11 November 1918 – 1. November 1918	Increase

III. Financial market environment and dataset

Among historians and political scientists there has been a long-lasting debate about whether or not the outbreak of World War I came as a surprise. From a financial market perspective there is little doubt about whether investors were taken by surprise by the developments during the last week in July 1914 (Ferguson, 2006). While only one week prior to the Austrian-Hungarian declaration of war on Serbia on July 28th markets did not show a sign of unrest, panic broke out at all larger European trading centers within a few days. By July 31st officials in all major European cities saw no other way out than to shut down their stock exchanges in order to prevent a complete market collapse (Bauer, 1976). With the exception of Geneva and Lausanne where trading was limited to fixed-income securities the Swiss exchanges were not able to evade these developments and remained closed at least until the beginning of 1915. *De facto* there was barely a difference in trading activities among the different exchanges in Switzerland as the trading frequencies in Geneva and Lausanne remained very low for the latter part of 1914.

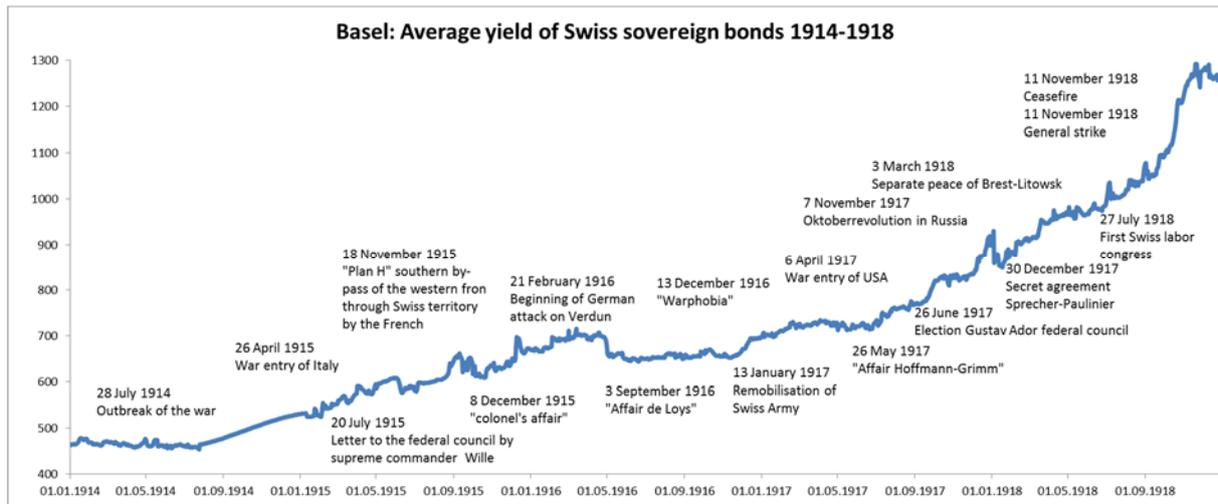


Figure 1: Average yield of Swiss sovereign bonds, Basel stock exchange, 1914-1918

Interestingly, the database at the beginning of the war is not representative of Swiss trading centers' performances during the rest of conflict. The market proved to be resistant and showed remarkable absorption capacity to the reflow of Swiss securities from abroad, mostly France and Germany which encouraged their citizens to sell foreign securities and invest in "native bonds." The reflows were particularly high in 1915 and 1916, continued to be so until the end of the war due to British and Dutch investors who wanted to get rid of their Swiss securities as well (Bauer, 1976). Nationalistic tendencies also reached Switzerland and even led to the Federal Council sympathizing with a specific regulation of trading. The plan was to establish a central board of admission for the stock exchanges whose purpose would have been "to counteract the irrational outflow of capital as well as protect market participants against capital losses" (Meier & Sigrist, 2006). The financial sector opposed this idea strongly and was able to fight off the establishment of a central control body. Nonetheless, these tendencies had an impact on market actors as foreign assets held by Swiss investors decreased from 8 to 2.5 billion francs between 1914 and 1920 (Bauer, 1976). When Zurich reopened its stock market in May 1916 the major trading centers had adapted well to the new conditions, particularly the bond markets. Both Basel and Geneva exceeded their pre-war bond trading levels by over 50 percent in 1916 and 1917¹³ (see tables 2 and 3). The Confederation also took advantage of this successful period – often referred to as the "war boom" – by introducing a federal stamp tax on the issuing and revenue of securities (Meier & Sigrist, 2006). Political development of both domestic and foreign kind as well as tightening of the market throughout 1918 stalled revenues. The lack of saturation on the bond market before 1918, however, is quite remarkable considering securities amounting to 2.5 billion francs had been subscribed to without foreign support since the beginning of the war (Bauer, 1976).

¹³ Due to a failed liquidation in addition to the difficulties related with the threat of war in July 1914 the Zurich stock market remained closed until May 1916. The liquidation was delayed for months and only overcome thanks to the support of a syndicate lead by the *Kreditanstalt* (Schmid & Meier, 1977).

	Basle	Geneva	Zurich
1913	17'122	30'636	19'876
1914	11'467	18'742	11'589
1915	4'862	15'892	---
1916	12'790	29'499	5'419
1917	14'909	30'969	10'863
1918	14'005	29'802	13'146
1919	15'383	32'513	13'877

Table 2: Amount of settlements by stock markets
(data: Stucki, 1924)

	Basle	Geneva	Zurich
1913	5'436	17'780	2'073
1914	4'818	12'668	1'349
1915	4'762	12'754	---
1916	8'274	19'908	2'885
1917	9'305	20'921	6'044
1918	6'214	18'679	4'878
1919	9'617	20'180	6'203

Table 3: Amount of bond settlements by stock markets
(data: Stucki, 1924)

For the dataset to meet quality standards two requirements need to be fulfilled: consistency and active frequency of trading. Most of the time series we obtained fulfill the first requirement with the period after the outbreak of the war until the end of 1914 being the exception. As mentioned either the stock markets remained closed (German part of Switzerland) or trade activities reached an irrelevant low (Romandy). For the purpose of presenting a dataset as continuous as possible the time series were combined if a substantial amount of values were missing. Having obtained bond data from Swiss trading centers only the bonds were traded under the same conditions which enables us to merge them. Thus, Basle and Geneva series were extended if required¹⁴. Due to the insignificance of Zurich's stock market from the beginning of the war until the midst of 1916 the procedure with Zurich data was limited to the pre-war period in 1914 as well as 1917 and 1918. All values before the outbreak of the war and from 1916 until the end of the war denote daily bid prices, whereas the data for the latter part of 1914 regularly includes ask prices due to the lack of trading activity in at the Geneva bond market which in turn implies running the risk of individual investors influencing prices. The quality of the data is fairly better for 1915 although the stock market reports contain larger gaps for several federal government bonds

¹⁴ As the empirical methodology's require the analyzed series to be continuous the remaining missing values (gaps in the quotation lists, weekends, holidays) were filled by conducting a linear interpolation.

(1897, 1903 and 1909). On average, however, the data contain at least two values per week in 1915.

The second essential requirement, regular bond trading activity refers to the observation that an unchanging bond price is to be attributed to a low level of trading rather than a lack of relevant information keeping the bond price constant (Waldenström & Frey, 2008). This particular problem concerns the above-mentioned *federal government bonds* (1897, 1903 and 1909) as well as four *mobilization bonds* (I, III, IV, V). However, the concerned periods are limited to the latter part of 1914, 1915 and a few weeks in 1918 after the market became saturated. Moreover, it is rare to observe steady prices for a longer period than two weeks.

Considering the dataset as a whole it is evident that most quality problems concern the period from the outbreak until the 4th quarter of 1915. However, these shortcomings must be considered in the appropriate historic context for every study based on hundred-year-old data faces such an obstacle. While it is therefore essential to interpret the results against the corresponding background it is as important not to downgrade the compiled data as bond markets at the time were not less developed than today's markets (Waldenström & Frey, 2007). Although scientific studies have yet to examine the sophistication of Swiss stock exchanges with regard to information dissemination or market thickness during the Gold standard the documentation of their histories suggests an appropriate market environment for Swiss trading centers. The main drivers of the positive development after the turn of the century were the constant increase in the list of quotations, the growing amount of investors as well as increasing revenues. With the exception of Geneva the markets experienced strongest growth during this pre-war period. While the exchange in Basel was successfully focused on fixed-income securities stocks dominated the Zurich market (Schmid & Meier, 1977). Geneva constituted a particularly large international financial center already in the 1870s and remained the largest national exchange until the war although it lost its international significance for the most part after the Bontoux crash in 1882 (Meier & Sigrist, 2006). The foreign exchange added in 1905 contributed significantly to the exchange's success during the war (Bourse de Genève, 1986).

IV. Empirical approach

In order to evaluate the impact of the different events during WWI on the sovereign bond market in Switzerland, we rely on the methodological approach that links major shifts in the yield of Swiss sovereign bonds traded on the different Swiss market places with military, political and social events that could have changed the risk perception of Switzerland being involved in WWI. We therefore employ a standard econometric technique developed by Bai and Perron (1998, 2003, 2006). The method was also used by Waldenström and Frey (2008) and is basically a further developed structural break analysis by Banerjee et. al (1992), which allows for multiple structural breaks in univariate time series.

The structural breaks are estimated by applying the following linear regression:

$$y_t = k_j + \varepsilon_t, \quad t = T_{j-1} + 1, \dots, T_j$$

where j ($j = 1, \dots, m + 1$) denotes the segments separated by m structural breaks. k_j denotes the estimated intercept, that is the average yield in each segment. y_t defines the sovereign yield during period t in basis points and ε_t describes the white noise error term. This method stands out as it does not require any prior information about the structural breaks' timing nor whether they exist at all in the estimated time series. They are estimated endogenously based on the available (price) information given by the data: „The indices (T_1, \dots, T_m), or the break points, are explicitly treated as unknown. The purpose is to estimate the unknown regression coefficients together with the break points when T observations on [the covariates] are available”¹⁵ (Bai & Perron, 2006, p.2). The main benefit of the Bai and Perron's further development of the original method (e.g. applied by Frey & Kucher (1998)) consists in the fact that it is no longer necessary to estimate overlapping segments of the investigated period as the method now allows to identify more than one structural break per segment¹⁶.

In order for the estimation to yield useful results the parameter determining the length of a segment for the breaks to be considered *structural* needs to be set. This allows us to differ between real structural breaks – referred to as *turning points* by Willard et al. (1996) – and so-called *blips* – wild market reactions caused by rumors or mere market nervousness (p. 1006). We established a one-sided restriction for our case: the breaks need to extend over at least 10 percent of the entire observation period, that is 1.5 to 2 months¹⁷. In addition to the method's simplification it enables a comprehensible interpretation of the results: the difference between two estimates $\hat{k}_j - \hat{k}_{j-1}$ corresponds to the size of a break in basis points or the yield change between two segments (Waldenström & Frey, 2008, p. 114). As Waldenström & Frey (2008) have discussed, the applied technique has some drawbacks as well; one being persistence in the data that may be problematic for consistently picking up the correct break points. The other becomes apparent in the possibility that break points are not only be caused by important war events but may also reveal macroeconomic fluctuations. We therefore not only rely on a single bond at a given trading place but compare the different bonds – government bonds as well as mobilization bonds - at the different trading places.

¹⁵ Like Waldenström & Frey we chose $T_0 = 1$ and $T_{m+1} = T$

¹⁶ Kucher & Frey (1998) defined a 36-month time window which they shifted month after month over their observation period (almost 20 years) in order not to miss a break.

¹⁷ In order to ensure a break to last for at least 1.5 months and thus be referred to as structural the parameter is set to $\varepsilon = [0.10, 0.15]$. Bai & Perron (2003) advise the parameter to be set at $\varepsilon = 0.20$ for a sample of $T=120$ – a value which is by far exceeded in this analysis.

V. Results

The empirical results' presentation follows the different periods of exposure introduced in section II. The periods are defined as follows¹⁸:

- I. April 1914 – August 1915
- II. April 1915 – May 1916
- III. February 1916 – April 1917
- IV. February 1917 – February 1918
- V. November 1917 – December 1918

Table 5-9 show structural breaks in single *federal government* and *mobilization* bonds during the different periods. In general, the 1897, 1913 Basle bonds, the Basle mobilization bonds II, III and V as well as the 1909 and 1913 Geneva bonds provide suitable results. The 95% confidence intervals indicate comprehensible periods of time with the exception of a few periods when the interval is strictly limited to one side, whereas it lacks a plausible restriction on the other side¹⁹ (e.g. period IV, Basle 1897).

Period I: March 1914 – August 1915

Given that Switzerland was not exposed to an explicit military threat prior to, during or after the closure (Basle) or the interruption of trading activity (Geneva) bond prices increased due to the outbreak of the war up to 30 percent. Based on the data it is evident that the belief in peace was widespread among market actors in Switzerland and maintained until a few days before the escalation of the conflict. The closure and de facto standstill of stock exchanges significantly complicates assessing the point in time at which investors changed their mind about the menace of a war. Bearing in mind that the runs on Swiss banks after the Austrian-Hungarian ultimatum against Serbia on July 23rd were followed by increasing pressure on the financial system it does not seem groundless to presume that perceptions about Switzerland's threat exposure changed days within the date of the ultimatum.

¹⁸ The periods are purposely overlapping in order not to miss a structural break at the end of a period.

¹⁹ The described phenomenon can also be observed in other studies such as Waldenström & Frey (2008).

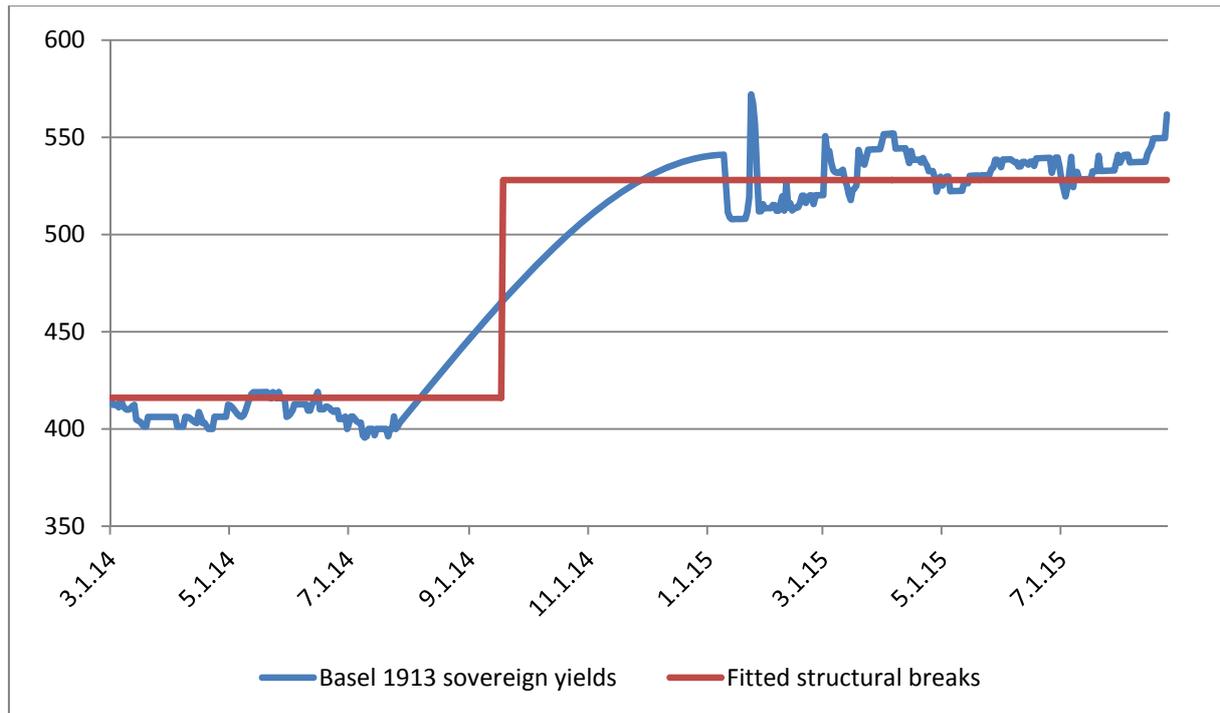


Figure 2: Basel 1913 sovereign yields and structural breaks.

Market, bond	Break date	Confidence interval (days)	Break size (basis points)	Concurrent war event
Basel 1913	23.09.1914	[-15, +17]	+112	Outbreak of war
Geneva 1913	17.09.1914	[-72, +10]	+121	Outbreak of war

Table 5: Structural breaks in Swiss sovereign yield, March 1914 – August 1915

Period II: April 1915 – May 1916

The structural breaks during the second period of observation accumulate during the summer months and a two-month period before the end of 1915. The breaks in the summer fall on the period in which the economic consequences of Italy's entry into the war began to attract the public attention. The break in the Geneva bond 1909 in the middle of August 1915 coincides exactly with the fierce public debate about whether the Federal Council had made economic concessions to the wrong party. In addition the breaks may reflect the growing awareness about the miscalculations of the Federal Council, the army command as well as large parts of the public concerning the duration of the war.

The most satisfying explanation for the structural breaks in November and December 1915 constitute the Central Powers military success in the form of the conquest of Serbia. The investors apparently shared the fear that the successful campaign improved Germany's strike power on the Western front in the medium term and the presumption the newly available resources could be used to circumvent the front through Swiss territory had its effect on the markets. While there is no doubt about what a well-guarded secret the French plan *H* was market actors were nonetheless likely to have suspected the warring parties to regularly evaluate their options in the view of the fact that no side had given up the belief in its ability to break through enemy lines.

It is interesting to note that no structural breaks were found indicating a growing threat as a result of the *colonels' affair* as has been suggested by historians. However, there are implications for an opposite development in the aftermath of the affair as suggested by the structural break in the Basel mobilization bond II at the end of April 1916 (see period III), well as the German attack at Verdun that moved the hostilities away from the Swiss border to the Northern end of the front.

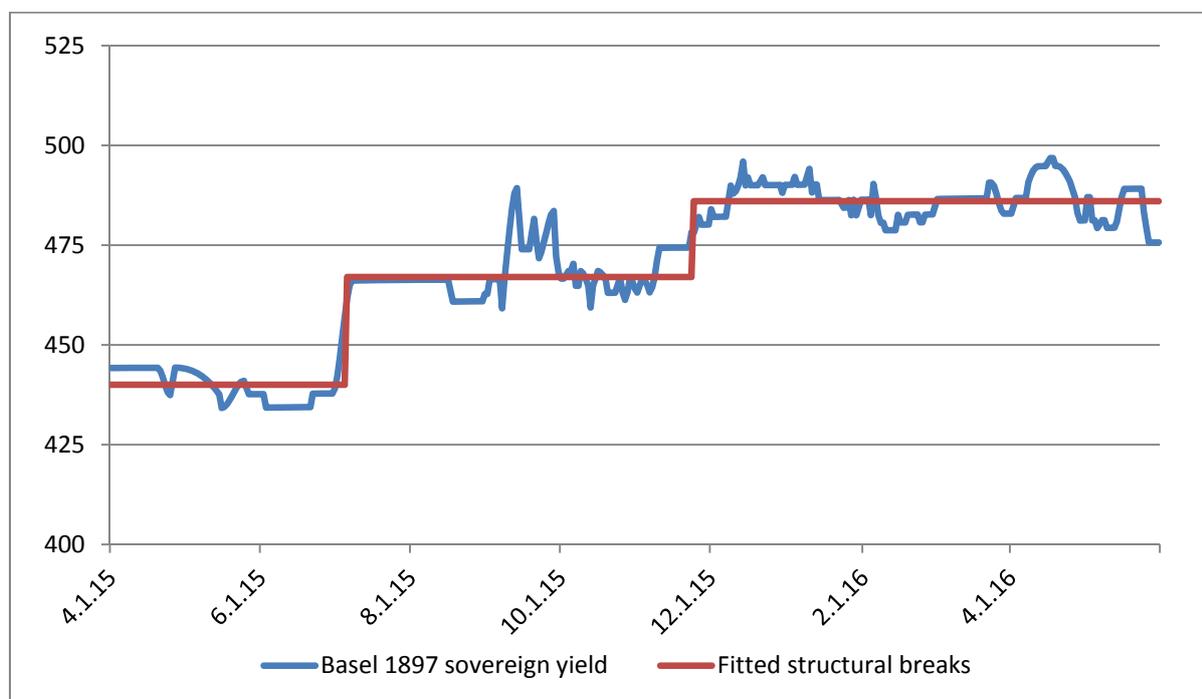


Figure 3: Basel 1897 sovereign yields and structural breaks.

Market, bond	Break date	Confidence interval (days)	Break size (basis points)	Concurrent war event
Basel 1897	05.07.1915	[-9, +65]	+28	Economic war
	22.11.1915	[-20, +34]	+18	CP success EF
Geneva 1903	13.08.1915	[-21, +31]	+39	Economic war
Basel 1909	07.12.1915	[-34, +92]	+178	CP conquest EF
Geneva 1909	01.11.1915	[-63, +120]	+254	CP conquest EF
Geneva 1913	17.11.1915	[-51, +212]	+53	CP conquest EF
Basel Mob II	24.11.1915	[-5, +10]	+37	CP conquest EF
	26.04.1916	[-7, +4]	-39	Domestic relaxation

Table 6: Structural breaks in Swiss sovereign yield, April 1915 – May 1916

Period III: February 1916 – April 1917

The mentioned implications concern the fact that the Swiss government was forced to prove its credibility regarding the country's neutrality. This effort – even though the actual endeavors such as talks with France were not public – seems to have contributed to the easing of the different domestic strains during 1916. In addition to this domestic explanation the decline in the country's exposure may also be caused by news from the battle of Verdun. The markets registered that the developments on the battlefield made a circumvention of

the front less likely as the battles at Verdun and along the river Somme (after the beginning of July) resulted in heavy losses on both sides reducing the resources of the warring parties substantially. While these reasons are difficult to distinguish, it seems reasonable to assume that the large breaks in spring (e.g. Basel mob II) root in the soothing of domestic aggressions rather than the battle of Verdun which provided no new information. The events at Verdun for the most part confirmed a fact of the trench warfare: the difficulty to provide results in the form of gained ground or a breakthrough for the attacker.

Investors remained convinced of the observation that resources for a surprise attack were scarce until Romania's conquest by the Central powers at the beginning of December 1916. The new assessment coincided with the rumors about a German assault on Switzerland spread by the French and taken up by the Swiss press. It seems certain that market actors attached thorough credence to the widespread fears – an analysis that covers the historians' assessment. The mobilization of two additional divisions at the beginning of February 1917 by the Federal Council – a sign of strength according to historians – did not leave a mark on the markets.

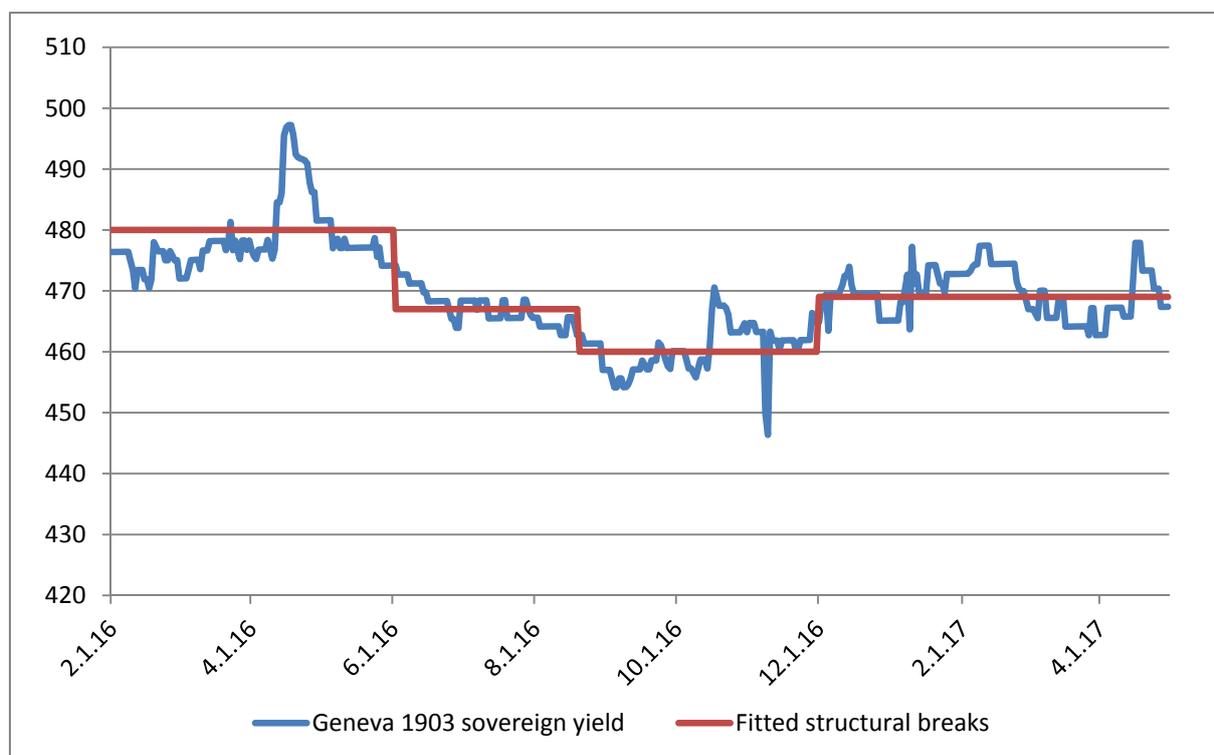


Figure 4: Geneva 1903 sovereign yields and structural breaks.

Market, bond	Break date	Confidence interval (days)	Break size (basis points)	Concurrent war event
Basel 1897	25.05.1916	[-108, +41]	-14	Domestic relaxation
Geneva 1903	07.06.1916	[-1, +140]	-12	War events WF
	18.08.1916	[-29, +18]	-6	War events WF
	01.12.1916	[-19, +13]	+9	"Warphobia"
Geneva 1909	27.01.1917	[-0, +220]	+194	"Warphobia"
Basel 1909	12.12.1916	[-70, +37]	+166	"Warphobia"

Basel Mob II	13.04.1916	[-235 +8]	-34	Domestic relaxation
	19.01.1917	[-28, +15]	+125	“Warphobia”
Basel Mob III	10.01.1917	[-16, +32]	+21	“Warphobia”

Table 7: Structural breaks in Swiss sovereign yield, February 1916 – April 1917

Period IV: February 1917 – February 1918

The breaks during the 4th period coincide with external and domestic events. Concerning external events the break in April (Basel 1913) is likely to be rooted in the United States’ entry into the war. The nearly concurrently initiated Nivelle offensive does not seem successful enough to have triggered a *structural* break. The ceasefire between Germany and the Bolsheviks as a direct cause of the October revolution and the commencement of talks for a separate peace treaty also caused structural breaks associated with a non-domestic event. For the third winter in a row there was public fear about a possible German assault through Swiss territory due to dispensable resources in the east.

Several breaks in both federal as well as mobilization bonds during the latter part of 1917 indicate the growing domestic difficulties the country was dealing with although it is difficult to correlate them with specific events. However, it seems comprehensible that general worsening of economic and social circumstances are registered by the bond market rather than single demonstrations even if they degenerate into violent outbursts resulting in the death of protesters. In return we can state that the Grimm-Hoffmann affair did mostly harm to the Federal Councilor personally and had no consequences in terms of endangering of Switzerland despite international outrage about Hoffmann’s solo effort.

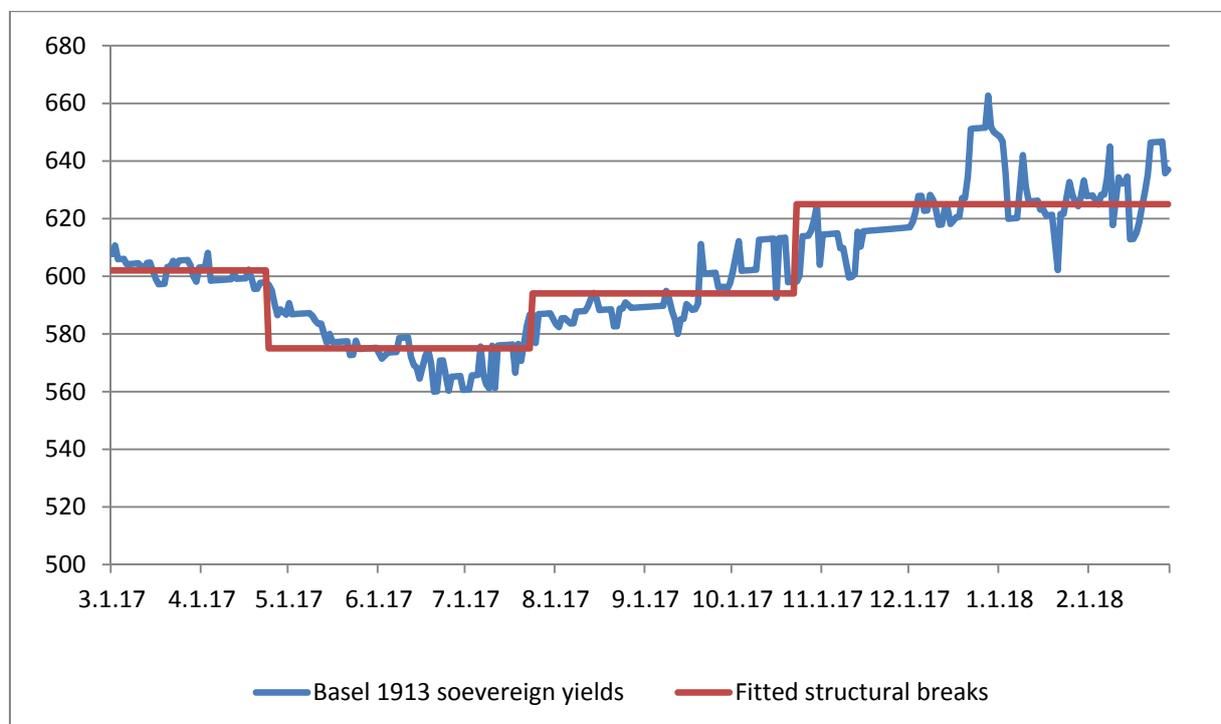


Figure 5: Basel 1913 sovereign yields and structural breaks.

Market, bond	Break date	Confidence interval (days)	Break size (basis points)	Concurrent war event
Basel 1897	30.09.1917	[-0, +412]	+20	Social misery
	10.12.1917	[-27, +7]	+18	Ceasefire Eastern F.
Geneva 1903	16.10.1917	[-18, +110]	+30	Social misery
Basel 1913	24.04.1917	[-7, +7]	-27	US entry into war
	24.07.1917	[-26, +14]	+29	Social misery
	23.10.1917	[-29, +9]	+31	Social misery
Basel Mob III	18.09.1917	[-0, +50]	+41	Social misery
	12.12.1917	[-7, +3]	+39	Ceasefire Eastern F.
Basel Mob V	16.07.1917	[-4, +80]	+18	Social misery
	07.12.1917	[-9, +3]	+33	Ceasefire Eastern F
Geneva Mob III	11.10.1917	[-11, +179]	+30	Social misery
	30.12.1917	[-0, +4]	+85	Ceasefire Eastern F.

Table 8: Structural breaks in Swiss sovereign yield, February 1917 – February 1918

Period V: November 1917 – December 1918

Investors were still reacting to the developments on the Eastern front. The signing of the peace treaty at Brest-Litovsk between Germany and the Bolshevik leadership lead to a yield increase implying that market actors still believed that troops from the Eastern front could be of use and danger in the West.

With regard to domestic affairs it is interesting to see that the bond markets remained calm throughout the summer of 1918 – much in contrast to the bourgeois public that according to historians considered the labor movement and its ideas a serious threat to public order and the political system. The threat assessment profoundly changed in October 1918 following numerous serious strikes such as the bank employees' strike at the end of September. Eventually there was little doubt for investors about the purpose of the general strike, an attempted coup d'état. Unfortunately, the closure of stock exchanges for a few days in November hinders the exact analysis when the situation was considered alarming. The quickly forced ending of the strike contributed to the absence of panic among investors.

Market, bond	Break date	Confidence interval (days)	Break size (basis points)	Concurrent war event
Basel 1897	13.10.1918	[-11, +31]	+31	General strike
Geneva 1913	26.10.1918	[-2, +63]	+171	General strike
Basel 1913	18.03.1918	[-38, +13]	+62	Separate piece Ger – R
	26.10.1918	[-2, +10]	+147	General strike
Basel Mob III	21.03.1918	[-11, +130]	+50	Separate piece Ger – R
	18.10.1918	[-27, +4]	+100	General strike
Basel Mob V	11.10.1918	[-22, +27]	+43	General strike
Geneva Mob III	03.01.1918	[-219, +4]	+106	Cease fire Eastern F.
Geneva Mob IV	03.01.1918	[-10, +19]	-330	??
	12.10.1918	[-16, +137]	+97	General strike

Table 9: Structural breaks in Swiss sovereign yield, November 1917 – December 1918

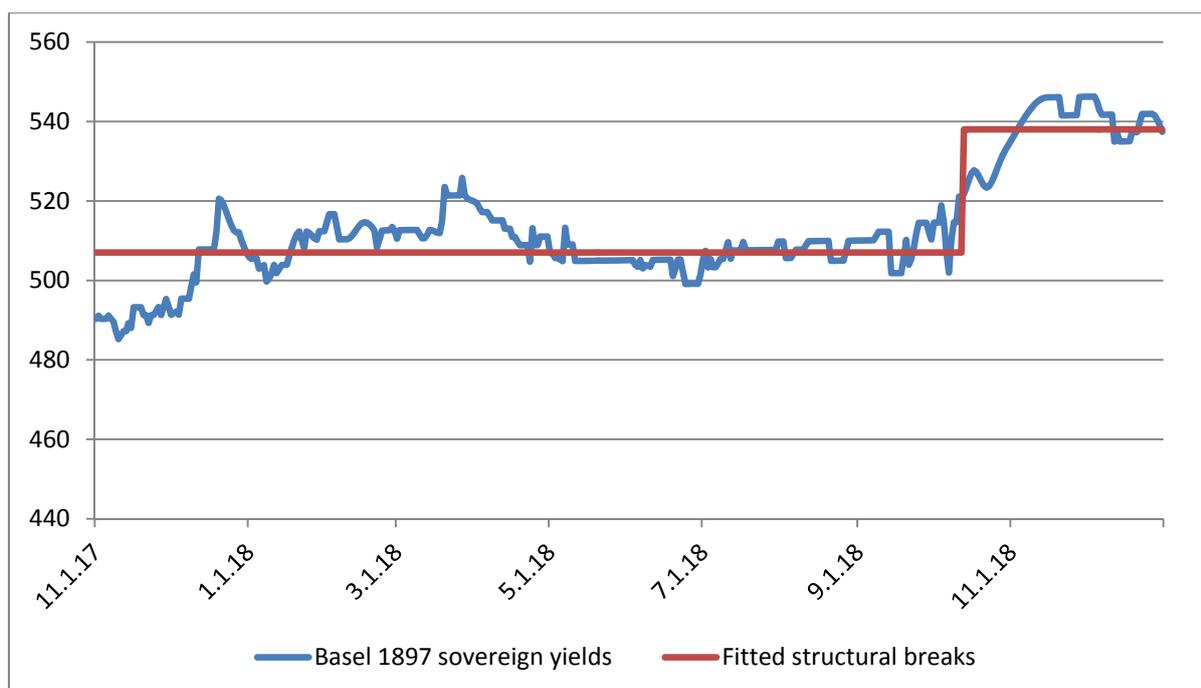


Figure 6: Basel 1897 sovereign yields and structural breaks.

V. Conclusions

The Swiss government was not prepared for the military, political and social challenges of WWI, when the country stayed neutral but was fully surrounded by warring parties. This is especially true for public finances. The federal government covered its expenses foremost by customs duties and had no income tax revenues until 1916/17. Thus, to finance the fiscal need caused by the military threat the Swiss government issued a series of government bonds and mobilization bonds. Consequently, any historical event that influences future costs for Switzerland to honor the debt should be reflected in the government bond yield. Suppose, an increase in the risk that Switzerland's neutrality would not be respected by the warring parties and hence involve the country in direct war activities. The result is risk perception of investors trading Swiss government bonds increases which is reflected in a rise of the bond yield. Fluctuations of the bond yield are therefore a valuable source of information to assess the risk perception of bondholders concerning the military, political and social threat that Switzerland was exposed to during WWI. An important advantage of these data are, that public perceptions and beliefs about the future state of Switzerland at a particular point in time are reflected irregardless of the later realization of these perceptions, which might bias an evaluation of the perceived risk.

Our analysis follows the method, which has been applied by Waldenström and Frey (2008) and is based on Willard et al. (1996) identifying structural break points in time-series of capital and money markets in times of war. We apply this method on the Swiss case during WWI (1914-1918). In order to analyze the capital market fluctuations, we constructed a new database on sovereign bond yields traded in Switzerland during WWI. The data consist of 4 government bonds and 9 mobilization bonds that were traded daily at various market places in Switzerland.

As a result of our structural break-point analysis a number of events are confirmed to be important for the Swiss case according to historians. This is especially true for external, military threats of aggression. For example, bond yields show structural breaks in the Winter 1915/16. This mirrors the Central Powers' military success in Serbia and the resulting change of the military focus towards the western front near Switzerland. While there is no doubt about what a well-guarded secret the French plan H was market actors are nonetheless likely to have suspected the warring parties to regularly evaluate their options by entering Swiss territory to break through enemy lines from the south. The Swiss government reacted in a diplomatic offensive to build up trust especially with France for maintaining neutrality in any case.

The relaxation of the situation during summer 1916 is also clearly revealed in the data of Swiss sovereign yields. The markets seem to have registered that the developments on the battlefield made a circumvention of the western front less likely as the battles at Verdun and along the river Somme (after the beginning of July) resulted in heavy losses on both sides reducing the resources of the warring parties substantially.

With regard to domestic events, it is interesting to see that the bond markets remained calm throughout the summer of 1918 – much in contrast to the bourgeois public that according to historians considered the labor movement and its ideas a serious hazard to public order and the political system. The threat assessment profoundly changed in October 1918 following different serious strikes such as the bank employees' strike at the end of September.

All in all, the actions taken by the Swiss government and the military supreme command during WWI seem to have responded to the external perils rather accurately. However, the impact of the war on social cohesion was considerably underestimated and was perceived by the markets as a risk for the country as a whole.

Our study is the first assessing the risk of a neutral country being involved in WWI by using data from sovereign bond yields. While our study does not make historical research less important, it does provide a useful way to evaluate the perceptions of the public at that time and thereby enriching the debate on the risks of war for a neutral country and the suitability of its actions taken.

References

- Bai, J., & Perron, P. (2003). Computation and Analysis of Multiple Structural Change Models. *Journal of Applied Econometrics*, 18, 1-22.
- Bai, J., & Perron, P. (1998). Estimating and Testing Linear Models with Multiple Structural Changes. *Econometrica*, 66, 47-78.
- Bai, J., & Perron, P. (2006). Multiple Structural Change Models: A Simulation Analysis. In D. Corbea, S. Durlauf, & B. E. Hansen, *Econometric Theory and Practice: Frontiers of Analysis and Applied Research* (S. 212-237). Cambridge University Press.
- Bauer, H. (1976). *Die Basler Börse 1876-1976*. Basel: Börsenkammer des Kantons Basel-Stadt.
- Bourse de Genève. (1986). *Bourse de Genève*. Genève: Association de la Bourse de Genève.
- Brown, B. (1988). *Monetary Chaos in Europe: The End of an Era*. London: Croom Helm.

- Brown, W.O. & Burdekin, R.C.K. (2000). Turning points in the U S. Civil War: A British perspective. *Journal of Economic History* 60, 655–669.
- Brown, W.O., Burdekin, R.C.K. (2002). German debt traded in London during the Second World War: A British perspective on Hitler. *Economica* 69, 655–669.
- Clark, C. (2012). *The Sleepwalkers. How Europe went to War in 1914*. Allen Lane, London.
- Ehrbar, H. R. (1976). *Schweizerische Militärpolitik im Ersten Weltkrieg: Die militärischen Beziehungen zu Frankreich vor dem Hintergrund der schweizerischen Aussen- und Wirtschaftspolitik 1914-1918*. Bern: Stämpfli & Cie AG.
- Ferguson, N. (2006). Political risk and the international bond market between the 1848 revolution and the outbreak of the First World War. *The Economic History Review*, 59, 70-112.
- Frey, B.S. & Kucher M. (2000). History as reflected in capital markets: The case of World War II, *Journal of Economic History* 60, 468–496.
- Fuhrer, H.R. & Olsansky M. (2008). Die „Südumfassung“. Zur Rolle der Schweiz im Schlieffen- und im Moltkeplan. In: Der Schlieffenplan. Analysen und Dokumente, Hans Ehlert, Michael Epkenhans und Gerhard P. Gross (Hg.). Paderborn / München / Wien / Zürich 2006. 311-338.
- Fuhrer, H.R. (2003). *Die Schweizer Armee im Ersten Weltkrieg: Bedrohung, Landesverteidigung und Landesbefestigung*. Zürich: NZZ Verlag.
- Gautschi, W. (1988). *Der Landsstreich 1918*. Zürich: Chronos.
- Guex, S. (2012). Öffentliche Finanzen und Finanzpolitik. In P. Halbeisen, M. Müller, & B. Veyrassat, *Wirtschaftsgeschichte der Schweiz im 20. Jahrhundert*. Basel: Schwabe.
- Halbeisen, P., & Straumann, T. (2012). Die Wirtschaftspolitik im Internationalen Kontext. In P. Halbeisen, M. Müller, & B. Veyrassat, *Wirtschaftsgeschichte der Schweiz im 20. Jahrhundert*. Basel: Schwabe.
- Jost, H. U. (2006). Bedrohung und Enge (1914-1945). In B. Mesmer, J.-C. Favez, & R. Broggini, *Geschichte der Schweiz und der Schweizer* (S. 731-820). Basel: Schwabe.
- Kucher, M., & Frey, B. S. (1998). Eine ökonomische Analyse der Bedrohungslage der Schweiz im 2. Weltkrieg. *Swiss Journal of Economics and Statistics*, 134 (4), S. 471-497.
- Meier, R. T., & Sigrist, T. (2006). *Der helvetische Big Bang: Die Geschichte der SWX Swiss Exchange*. Zürich: NZZ Verlag.
- Mittler, M. (2003). *Der Weg zum Ersten Weltkrieg: Wie neutral war die Schweiz*. Zürich: NZZ Verlag.
- Neidhart, L. (2013). *Politik und Parlament der Schweiz. Ein Rückblick in das 20. Jahrhundert*. Zürich: NZZ Verlag.
- Oosterlinck, K. (2003). The bond market and the legitimacy of Vichy France. *Explorations in Economic History* 40, 326–344.
- Röthlisberger, H. C. (1975). *Der politische Standort von Ulrich Wille*. Stäfa: Th. Gut & Co. Verlag.
- Rapold, H. (1988). *Der Schweizerische Generalstab: Zeit der Bewährung? Die Epoche um den Ersten Weltkrieg 1907-1924* (Bd. 5). Basel: Helbing & Lichtenhahn.

- Ruchti, J. (1928). *Geschichte der Schweiz während des Weltkrieges 1914-1918: I. Band: Politischer Teil*. Bern: Paul Haupt.
- Ruchti, J. (1930). *Geschichte der Schweiz während des Weltkrieges 1914-1918: II. Band: Kriegswirtschaft und Kulturelles*. Bern: Paul Haupt.
- Ruffieux, R. (2006). Die Schweiz des Freisinns (1848-1914). In B. Mesmer, J.-C. Favez, & R. Broggini, *Geschichte der Schweiz und der Schweizer* (S. 639-730). Basel: Schwabe.
- Ruoss, E. (1992). *Die Geldpolitik der Schweizerischen Nationalbank 1907-1929: Grundlagen, Ziele und Instrumente*. Zürich.
- Schmid, H., & Meier, R. T. (1977). *Die Geschichte der Zürcher Börse*. Zürich: NZZ Verlag.
- Schmid-Ammann, P. (1967). *Die Wahrheit über den Generalstreik von 1918*. Zürich: Morgarten.
- Schoch, J. (1972). *Die Oberstenaffäre: Eine innenpolitische Krise 1915/1916*. Bern: Lang.
- Schweizerische Nationalbank. (1932). *Die Schweizerische Nationalbank 1907-1932*. Zürich.
- Schweizerische Nationalbank. (1944). *Statistisches Handbuch des Schweizerischen Geld- und Kapitalmarktes*. Zürich.
- Schweizerische Nationalbank. (2007). *Die Schweizerische Nationalbank 1907-2007*. Zürich.
- Sprecher, D. (2000). *Generalstabschef Theophil Sprecher von Bernegg: Seine militärisch-politische Leistung unter besonderer Berücksichtigung der Neutralität*. Zürich: NZZ Verlag.
- Stucki, W. (1924). *Die schweizerischen Effektenbörsen während und nach dem Weltkrieg 1914-1921*. Zürich: Rascher.
- Waldenström, D., & Frey, B. S. (2008). Did nordic countries recognize the gathering storm of World War II? Evidence from bond markets. *Economic History*, 45, S. 107-126.
- Willard, K. L., Guinnane, T. W., & Rosen, H. S. (September 1996). Turning Points in the American Civil War: Views from the Greenback Market. *The American Economic Review*, 86 (4), S. 1001-1018.