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Why does sovereign risk differ for domestic and external debt? Evidence from Scandinavia, 1938–1948

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A B S T R A C T

This study shows empirically that the political costs of sovereign default can differ considerably for domestic and external debt. The analysis uses new evidence from Danish and Swedish bond markets around World War II, a time when markets went from being fully integrated to fully segmented overnight. By linking the exogenous wartime shocks to changes in default costs on domestic and external debt, it is found that these costs explain a significant part of the variation in the sovereign yield spread across markets. The results suggest that governments can choose strategically on which debt, the domestic or the external, to default on, and that this decision hinges on the relative size of the political default costs.

1. Introduction

Domestically issued domestic-currency government debt has for a long time been a major source of public finance for many developed and developing countries (Reinhart et al., 2003; Reinhart and Rogoff, 2008). Despite this fact, standard models of sovereign debt typically focus on the repayment of external government debt, i.e., loans issued in foreign currency to foreign markets. Specifically, when assessing the costs of default these models focus on costs of defaulting on external debt such as deteriorated credit reputation on international capital markets (Eaton and Gersovitz, 1981; Kletzer and Wright, 2000), risk of triggering various forms of direct sanctions (Bulow and Rogoff, 1989a,b) and curbed trade flows (Rose, 2005).

In a more recent sovereign debt default literature, however, researchers argue that the costs of domestic defaults are both quantitatively as important as the costs of external debt defaults and

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qualitatively different in nature. In Drazen (1998) and Di Gioacchino et al. (2005) domestic creditors are characterized as belonging to the constituency upon which the government relies for its political support. Unlike foreign creditors, domestic debt holders are thereby able to credibly threaten to punish sovereigns in case of a domestic default by refusing re-election. Gelpern and Setser (2004) point out that local elites are often large investors in domestic government bonds and that they may hence be expected to exert all their influence to prevent the government from repudiating its domestic debt, possibly even pushing it to instead repudiate its foreign loans.[1] Taken together, these models complement the traditional sovereign default models cited above, their main message being that if the groups holding domestic and external debt, and their means to punish a defaulting sovereign, differ the expected costs of domestic and external defaults will most likely also differ.

Past empirical studies of sovereign defaults have primarily focused on countries' external debt, some examining the explanatory power of the standard models (e.g., Obstfeld and Taylor, 2003; Rose, 2005; Mitchener and Weidenmier, 2010) while others have searched for additional institutional or political factors to either explain changes in market-based risk assessment of external debt (e.g., Mauro et al., 2002; Hilscher and Nosbusch, 2008) or the incidence of actual external debt defaults (Kohlscheen, in press; Bordo and Oosterlinck, 2005). Van Rijckeghem and Weder (2009) examine the likelihood of defaulting on both domestic and external debt. They find that political institutional variables such as democratic standards or type of electoral systems matter, but primarily in conjunction with severe macroeconomic stability, e.g., low levels of inflation. Tomz (2004) studies how individual voter preferences correspond to the expected distributional effects of a domestic debt default, finding that they are well in line with the "political default cost"-channel proposed by the model of Drazen (1998).

This paper examines how changes in the expected costs of defaulting on domestic and external debt influence the spread in sovereign risk between domestic and foreign markets. To my knowledge, this is the first time such an analysis is conducted. The study rests on a unique historical episode, World War II, when a series of exogenous political shocks both shifted the relative cost of domestic and external defaults and abruptly segmented international capital markets. While the exogeneity of the cost shocks is important for the interpretation of the measured effects, capital market segmentation is necessary for being able to contrast the different theories on external and domestic default costs, as it ensures a stable linkage between creditor nationality and debt type with no arbitrage trading or debt buybacks by borrowing governments.

In the empirical analysis, newly assembled market yields on Danish government bonds traded on Danish and Swedish markets during 1938–1948 are used to compute a Danish "sovereign risk spread" between external and domestic debt. Specifically, this relies on separating out all non-risk related yield influences when calculating the spread, e.g., market differences in macroeconomic fluctuations, portfolio diversification opportunities, risk aversion and market microstructure regulations. The resulting sovereign risk spread is then regressed on a set of exogenous wartime shocks that, arguably, influenced the costs for the Danish government to default on its domestic and external debt in different ways.[2]

The paper proceeds as follows. Section 2 describes the institutional settings in the Danish and Swedish secondary bond markets, including details on pricing, trading and regulatory changes in the study period. Section 3 presents the basic empirical methodology and Section 4 discusses the data. In Section 5, the main results along with a robustness analysis are presented. Section 6 concludes.

2. Institutional setting

This section outlines important institutions for the Danish and Swedish secondary government bond markets in the late 1930s and 1940s and discusses the extent to which any of them could have a separate influence on bond market yields. The main messages are the following. First, these markets

[1] Furthermore, Reinhart et al. (2003) argue that another cost of a domestic default is the possibly resulting turbulence on domestic banking markets, which could hurt government finances (Reinhart et al., 2003). Roubini (2001) emphasizes moral and equity reasons for discriminating between domestic and external defaults.

[2] There were trading halts on the Copenhagen Stock Exchange in September 1939 and April-May 1940, but Danish financial newspapers reported the bond quotes on the curb market which were regarded as representative (see Section 2). Moreover, the analysis in section 6 shows that the impact on government yields of these circuit breakers was marginal.

Table 1
Danish and Swedish bond market microstructure around World War II.

	Copenhagen (Denmark)	Stockholm (Sweden)
Bond market facts:		
Main market	Copenhagen Stock Exchange	Stockholm Stock Exchange
Number and types of bonds listed	250 bonds altogether (20 governmental), all domestic and denominated in Danish currency.	60 bonds altogether (15 governmental, 10 foreign). All denominated in Swedish currency.
Reporting frequency	Daily	Biweekly (domestic), weekly (foreign)
Trading volumes 1938–1948 (monthly average).	All bonds: 470 million DKK (MDKK) Danish government bond in the study: 0.14 MDKK ($\approx$ 0.03% of total bond trading)	All bonds: 164 million SEK (MSEK) Danish government bond in the study: 0.04 MSEK ($\approx$ 0.02% of total bond trading)
Monthly average trading volume, total (OTC + Exchange), 1926, 1948–1952.	No information on OTC volumes.	1926: 179.1 MSEK, of which OTC 134.1 MSEK (75%) and Exchange 45 MSEK (25%). 1948: 1,714 MSEK, of which OTC 1,356 MSEK (79%) and Exchange 358 MSEK (21%). 1949–1952 (average): 7,421.1 MSEK, with OTC 6,934.4 MSEK (93%) and Exchange 486.7 MSEK (7%).
Rules and regulations:		
Price limits	1. 9/1/39–9/22/39: Prices 2% below the 8/31/39 level prohibited. 2. 9/23/39–2/23/46: Price decreases of more than 1% per day prohibited.	9/1/39–1/2/40: Price decreases of more than 5–10% per day prohibited..
Trading halts	1. 9/1/39–9/11/39 2. 4/9/40–5/27/40 3. 5/8/45–5/18/45	No trading halts.
Capital controls	Currency transfers restricted from Jan. 1940. Capital in- and outflows stopped from Apr. 1940.	All capital and currency in- and outflows without approval of the Bank of Sweden stopped from Feb. 1940.

Sources: For Copenhagen: data on issues come from stock exchange price lists published in *Finanstidende*; trading volumes come from Statistics Denmark and the daily data of the study; rules and regulations are collected from articles in *Finanstidende*, 10 Apr. 1940, p. 589. For Stockholm: data on issues come from stock exchange price lists; trading volumes come from the stock exchange and a newly collected sample of trading in foreign bonds on the exchange collected every third month during 1938–1948; OTC data for Jan.-Jun. 1926 come from a Banking Inspection survey published in a government proposal (Prop. 1927:56 p. 13) and for 1948 onwards from the Banking Inspection recurrent official publication *Uppgifter om bankerna samt uppgifter om fondkommissionärerna och fondbörs*; rules and regulation data come from Algott (1963) and Valutakommittén (1980), SOU 1980:51, ch. 1.

functioned relatively freely throughout this period and pricing within countries was largely unrestricted, despite wartime regulations that in particular affected the Copenhagen Stock Exchange. Second, trading in the analyzed Danish bonds was continuous in both markets, indicating sufficient levels of market liquidity. Third, integration of Danish-Swedish capital markets was high in the interwar period but broke down completely at the outbreak of World War II. Hence, during the war only domestic (Danish) investors could trade Danish domestic debt in Denmark and only foreign (Swedish) investors could trade Danish external debt in Sweden.

Table 1 presents some stylized facts from the bond markets in Copenhagen and Stockholm. The Copenhagen market was considerably larger in terms of bonds listed and trading. Still, the statistics in Table 1 and contemporary newspaper reportings indicate that trading was continuous and significant in both markets throughout the period, which is important for establishing acceptable levels of price efficiency (Silber, 1991; Longstaff, in press).[3]

[3] For example, Gejl (1989, p. 288) describes the large trading activity on the Copenhagen secondary bond markets during the entire war period, which was driven by high liquidity levels in the economy. Market reports in the newspapers report the same thing (see, e.g., the article "Fondsbørsen og krigen", *Berlingske Tidende*, Jan. 1, 1941, p. 8 or "Obligationsmarkedet" in *Obligationstidende*, Jun. 5, 1940, No. 7).

Market microstructure regulations were similar in Copenhagen and Stockholm during this period, as also shown in Table 1. This suggests an overall limited influence on price differentials from such institutional factors. There is evidence on circuit breakers (right after some wartime events) and price limit, mainly in Copenhagen, but as shown in this paper's robustness section these influences had no lasting effect on market returns.[4]

The integration between Danish and Swedish capital markets varied dramatically between 1938 and 1948. During the interwar period, markets were fully integrated as evidenced by the significant cross-border flows shown in Fig. 1. Important for the present study, however, is that there are no indications in either data or other historical sources that the Danish interwar loans that were floated in Sweden were bought back by Danish investors prior to 1939. The amounts borrowed by the Danish government greatly exceed the purchases by Danes, ruling out any important buyback activity.[5] The historical writings on this period's capital markets also suggest that the Danish government bonds kept in the balance sheets of the large Swedish financial institutions.[6] The Danish contemporary financial press does also not indicate that Danes held large amounts of Danish bonds issued in Sweden.[7] Following the outbreak of World War II, international capital market integration broke down abruptly through the imposition of capital controls. Fig. 1 depicts clearly how the capital flows dropped after late 1939. Notably, the wartime segmentation of Danish and Swedish capital markets was not overridden by third-country markets, at least not via Great Britain and the United States as the flows to and from these markets also stopped after the war outbreak.

New issues of Danish domestic and external government debt could also influence secondary market yields. According to standard asset pricing theory, an increased supply increases the government's debt service load on fiscal inflows which, all else equal, increases the sovereign risk. An increased supply also pushes the secondary market prices of government bonds down or, equivalently, the yields on government bonds up. During 1939–1945, the Danish government issued four new domestic but no new foreign loans, which, if anything, hence should have increased domestic yields and left foreign yields unchanged.[8]

Politically motivated interventions in bond markets is another potential source of distortions of market returns. Most obviously, the government could command the central bank *Nationalbanken* to purchase government debt if the bond price is falling beyond target levels. Taking stock with the available statistical and anecdotal evidence, however, such non-market interference was infrequent and, in any case, not effective in the long run. The Danish bonds held by *Nationalbanken* only increased marginally between June and December 1939, and even decreased during the most critical period, December 1939–June 1940 (Svendsen et al., 1968, p. 16). Furthermore, the monetary policy issues addressed by *Nationalbanken* in the early war years rather concerned how to prevent interest rates from falling too much in the light of the abundant liquidity levels in the Danish economy.[9] In other words, the Danish central bank worked to raise, not reduce, market interest rates during the war period.

[4] On all these events in Denmark, see *Finanstidende* Sep. 6, 1939, p. 1020; Sep. 27, 1939, p. 1077 and Feb. 27, 1946, p. 430. For Sweden, Algott (1963, pp. 182ff) states that market yields were typically unrestricted. The only exception would be around December 1939 after the Soviet invasion of Finland.

[5] Using the data on quarterly flows underlying Fig. 1, one can compare the Danish loans in 1936 (SEK 35 million) or 1938 (SEK 30 million) with the sum of all Danish purchases of securities in Sweden between 1936 and 1940 subtracted by either the average Danish purchases in 1934–1936 or the Swedish purchases of Danish securities. In the first net-of-average case, the possible Danish buybacks represent at most 27 percent of the 1936 loan and 13 percent of the 1938 loan. In the second net-of-Swedish purchases case, the possible buybacks were – 2 percent and – 34 percent for the 1936 and 1938 loans, respectively.

[6] Ohlin (1941, 21–34) provides a detailed survey of the Swedish capital market at this time, showing that the large banks and insurance companies that were underwriters to the Danish loans typically retained most of their underwritten bonds in their own portfolios.

[7] For example, all issues of the Danish financial weekly *Finanstidende* were gone through in search for reports on Danish debt abroad, which would signal an interest among Danes in Denmark for this debt. However, the only instance when this was found was in June 12, 1940, and then the Danish debt in Sweden is described, or even defined, as "the Danish bonds that is owned by Swedes" (p. 761).

[8] Statistics Denmark (1969), pp. 205–206.

[9] In fact, new treasuries and long-term government bond loans were issued and higher cash reserve ratios for the banking system were imposed (Johansen, 1986, pp. 87–90; Hoffmeyer, 1968, pp. 229–231, 240–249).

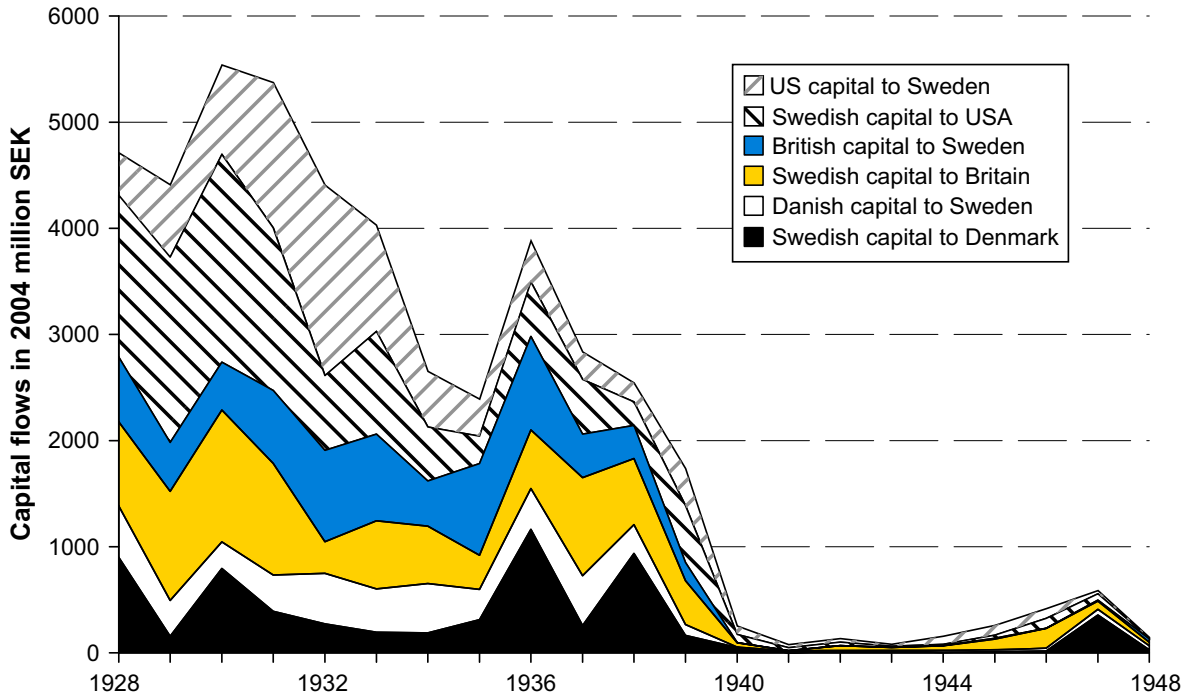

Fig. 1. Cross-border portfolio flows intermediated by Swedish financial intermediaries, 1928–1948. Notes and sources: "Swedish financial intermediaries" are the 40–50 commercial banks and stock brokers reporting to the Swedish Banking Inspection. The source is the Banking Inspection's "Bankbolags och vissa fondmäklares värdepappersaffärer med utlandet" in *Ekonomiska Meddelanden*.

3. Estimation methodology

The estimation approach is based on relating differences in sovereign risk between domestic and foreign markets with changes in the relative cost of defaulting on domestic versus external debt. For this purpose, one needs to separate out all sovereign yield spreads influences—nominal and real—that are not associated with default risk such as macroeconomic fluctuations (expected inflation differentials), portfolio allocation (market interest rate and stock market return differentials) and differences in institutional market microstructure constraints.[10] Specifically, the variables of interest are:

Macroeconomic fluctuations: In order to characterize the influence coming from inflation rate differences a set of parity relationships from international economics are used. In the uncovered interest rate parity (UIP), nominal yields should be equal across markets once expected depreciation is controlled for. The real interest rate parity (RIP) states that real yields should equalize across markets (at least in the "long run").[11] While the UIP and RIP concepts are admittedly stylized, they are widely used in studies of the role of macroeconomic factors to the level of market integration and interest rate differentials (see, e.g., Jackson and Lothian, 1993; Lothian, 2002; Lothian and Wu, 2005).

Portfolio allocation factors: The cost of holding fixed-income securities also depends on the variability of market interest rates (the interest rate risk) as well as the returns to other investment opportunities (Cuthbertson, 1996, ch. 9). In order to accounted for these influences on sovereign spreads, differentials in market interest rates and stock market returns are included in the estimations.

Institutional differences: Changes in market microstructure constraints, e.g., price limits and trading halts (Charemza and Majerowska, 2000) and illiquidity (Silber, 1991; Longstaff, in press), can have sizeable effects on recorded asset returns. Section 2 showed that most bond market institutions (e.g., taxes on cash flows, commission fees and market liquidity) were either the same in Denmark and

[10] All *identical* yield determinants across debt types and markets, such as the term premium in this paper, cancel out entirely.

[11] The RIP result draws on a combination of UIP and the relative purchasing power parity (PPP), which states that expected depreciation should correspond to the differences in expected inflation.

Sweden or did not change during the study period, implying that they enter as constants in the empirical estimations. As for the circuit breakers in Copenhagen, a separate analysis in Section 6.1 shows that they had no lasting effect on sovereign spreads.

Political costs of defaulting on domestic and external government debt: In the introduction, two complementary literatures on sovereign debt default were discussed. One of them focuses exclusively on the costs of defaulting on external debt, which are a deteriorated international credit reputation (e.g., Eaton and Gersovitz, 1981; Kletzer and Wright, 2000), direct sanctions (Bulow and Rogoff, 1989a,b) or curbed trade flows (Rose, 2005). The other literature emphasized the role of costs of domestic defaults, mainly in the form of political punishments coming from deprived domestic creditors also being voter groups (Drazen, 1998; Di Gioacchino et al., 2005) or local special interests (Gelpern and Setser, 2004). In order to analyze whether these costs really influenced the market-assessed sovereign risk on Danish external and domestic debt in the 1930's and 40's, I employ the exogenous political wartime shocks to Denmark and the Danish government that arguably affected the domestic and external default costs differently. Specifically, the theoretical sovereign debt models are applied to the political and economic historiography of Denmark and Sweden and then used to deduct shifts in the *relative cost* of defaulting on domestic versus external debt following each of these severe shocks.[12]

In Table 2, the resulting theory- and history-based classifications of relative default costs are presented. During the initial pre-war period, Denmark faced high default costs on all debt types. External default costs were high, since Denmark had a default-free credit history and hence, potentially high reputational costs in terms of more expensive future borrowing. Domestic costs were also high, since bondholding was widespread among the Danish people and, accordingly, the creditors were likely to be a large part of the government's constituency.[13] The first severe political shock came with the outbreak of World War II, when external default costs were reduced for two reasons. First, the reputational costs of a default are likely to be smaller if the default is driven by exogenous fiscal shocks, as during wars, and not purely by the will of sovereigns. Second, historians report that the Danish government disliked the fact that in early 1940, the Swedish government refused to promise to support of Denmark in case of an attack (Lidegaard, 2005, p. 150). The domestic default costs remained high, however, since the economic difficulties caused by the war made the Danish people more inclined to check that the government did not try to inflate away public debt, e.g., by printing extra money.[14]

The German occupation on April 9, 1940 profoundly changed the Danish political situation. The Danish government did remain in office controlling most fiscal and political issues. Still the Germans came to tax the country heavily and practically gained the residual control of the country. Historians emphasize that the Germans were keen on keeping the Danish people reasonably satisfied during the war in order to prevent any disruptions in the important Danish-German trade and to keep occupation costs low (Johansen, 1986, p. 72). This hence suggests that the domestic default costs remained high for the Danish government. The Swedish creditors, however, became considerably more worried by this development. Germany was a notorious sovereign debt defaulter since several years and its occupation of Denmark was not interpreted positively with respect to the Danish foreign debt. Contemporaries in Sweden also seem to have expected at least a partial default, triggered by the Germans.[15]

[12] The periodization largely relies on the historical descriptions of Johansen (1986, ch. 4–6) and Lidegaard (2005). Oosterlinck and Landon-Lane (2006) study how the effect of political shocks during World War I affected Russian government bond price differentials, but they use a different definition of shocks (deriving them from the time-series properties and not theoretical sovereign debt models) and focus on other questions than the ones focusing on costs of domestic and external default.

[13] All Danish loans issued in Sweden in the 1930's were fully subscribed, but not without problems. A Swedish commentator said about the 1936 loan that it was "over-subscribed to a surprisingly large degree considering the risk associated with the Danish economic and political affairs. (…) The underwriters did, however, recognize these risks by setting the effective interest rate significantly higher than would have been the case for an equivalent loan by Finland or Norway" (*Affärsvärlden*, May 14, 1936, p. 500) [*own translation*]. Interestingly, this skepticism was not present when the 1938 loan was overtaken at par (*Affärsvärlden*, Nov 10, 1938, p. 1188).

[14] See, e.g., Johansen (1986, p. 72) and *Finanstidende* Mar. 13, 1940, pp. 484f. See also the analysis by Waldenström and Frey (2008) of pre-war threat assessments in the Nordic countries during 1938–1940, which supports the notion of the war outbreak and the German occupation as large political shocks.

[15] *Affärsvärlden* May 4, 1940, p. 396.

Table 2
Explaining the yield differentials across markets, 1938–1948.

Period	C_D	C_E	$\frac{C_D}{C_E}$	$\Delta\frac{C_D}{C_E}$	Political events driving the costs of sovereign default.
Prewar: 1938:1–1939:8	High	High	1		Denmark had no past defaults and integrated capital markets made it impossible to discriminate between bondholder nationalities, which is the reason why default costs were equally high for all parties and debt types.
War: 1939:9–1940:3	High	Med	>1	+	*Event: Outbreak of World War II (Sept. 1, 1939).* The war reduced external default costs, partly since reputational costs are lower for wartime defaults and partly as historians report how the Danish government disliked a Swedish refusal in the early 1940 to assist Denmark in case of war. Domestic default costs remained high as contemporary sources report that the Danish people were aware of the risk of the government trying to deflate away its domestic debt.
Occupation: 1940:4–1943:8	High	Low	>>1	+	*Event: German occupation (April 9, 1940).* Despite the occupation, historians report that the Danish government remained in place to govern local politics and fiscal matters and that the German occupant, wanting undisrupted trade flows and small occupation costs, wanted the support and compliance of the Danish people. Swedish creditors felt considerably more worried and seem to have expected at least a partial default triggered by the Germans.
Martial: 1943:9–1945:5	Med	Low	>1	–	*Event: Germany dissolves the Danish government and introduces martial law (Aug. 29, 1943).* Germany takes political and fiscal control over Denmark, which clearly signals a reduced concern about the Danish people and reduced costs of a domestic default. The cost of external default was arguably unchanged and low.
Peace: 1945:6–1948:12	High	High	1	–	*Event: Peace (May 8, 1945).* Back to pre-war Scandinavian relations.

Note: C_E and C_D denote costs of external debt default, C_D = cost of a domestic debt default. The periodization largely relies on the historical descriptions of Johansen (1968, ch. 4–6) and Lidegaard (2005).

A third political shock in Denmark occurred in August 29, 1943, when the Germans, after a long raid by the Danish resistance movement, finally dissolved the Danish government, proclaimed martial law and took control over most political and fiscal issues (Johansen, 1986, p. 87). If anything, this must have reduced the ability of the Danish people to punish the domestic debtor, i.e., now the German occupants, thereby reducing domestic costs of default. By contrast, the costs of an external default hardly changed after this event as they were already on a quite low level. Finally, the peace in May 1945 was a major political event that restored the Danish debt servicing policy to its pre-war situation. This restoration is evidenced by the issuance of a new Danish loan to the Swedish bond market in 1947 (which is visible in Fig. 1 as an increase in the Swedish capital export to Denmark that year).

Adding up, the estimation using nominal yield spreads and hence, the UIP framework is:

$$NomSpread_{ED,t} = \beta_0 + \beta_1 NomIntDiff_t + \beta_2 NomMarkDiff_t + \delta_j T_j + e_t, \quad (1)$$

where $\text{NomSpread}_{\text{ED},t}$ denotes the spread between secondary market yields on nominal external (E) and domestic (D) debt at time t,[16] NomIntDiff_t is the difference between short-run interest rates on foreign and domestic markets, NomMarkDiff_t is the equivalent difference between the return on stock market portfolios, and T_j are the dummy variables capturing the impact of the changes in relative

[16] The UIP is commonly tested as $s_{t+n} - s_t = \alpha + \delta(\text{SPREAD}_{DE}) + \varepsilon_t$ (see, e.g., Lothian and Wu, 2005; Chinn, 2005), with a predicted δ of unity. Since this study defines the spread as SPREAD_{ED} and puts it on the left-hand side, the predicted UIP-coefficient is negative.

default risk described above and in Table 2.[17] The equivalent equation using real yield spreads and the RIP framework is

$$RealSpread_{ED,t} = \gamma_0 + \gamma_1 RealIntDiff_t + \gamma_2 RealMarkDiff_t + \delta_j T_j + e_t, \quad (2)$$

where $RealSpread_{ED,t}$, $RealIntDiff_t$ and $RealMarkDiff_t$ are the real variants of the market differentials defined above, with details on the variables described in Section 4. Both Eqs. (1) and (2) are estimated with OLS, using Newey and West (1987) standard errors to control for the potential serial correlation in the residuals caused by overlapping observations of the *ex post* forward rates.

4. Data

The main bond data used are yields to maturity calculated from end-of-month bid prices of Danish long-run government bonds issued in Denmark and Sweden and traded at the Copenhagen and Stockholm Stock Exchanges during 1938–1948.[18] Since Eqs. (1) and (2) are based on cancelling out all non-risk factors explaining the Danish yield spreads across markets, the Danish government bonds from each market were selected to match each other as closely as possible. These are the 4% 25-year loan of 1934 issued in Danish *kronor* and traded in Copenhagen, and the 4% 20-year loan of 1936 issued in Swedish *kronor* and traded in Stockholm. The coupons for both these loans were paid semiannually. As noted by Statistics Denmark (1969, p. 226), the 1934 loan was prematurely redeemed in July 1950 but I have not found any indications or announcements of this in the financial chronicle *Finanstidende* in the years preceding the event and hence, disregard this early call in the yield calculations. Available official documentation and financial press in both countries suggest that all bondholders, both home and abroad, received coupon payments throughout the period.[19]

Fig. 2 depicts the nominal yields of the analyzed loans.[20] One may take notice of the relatively low yield levels of the Danish domestic loan traded in Copenhagen, with a yield not exceeding five percent at any point in time and exhibiting a downward sloping trend during the war. These low yields were discussed intensely among contemporary commentators and have also been subject of several postwar investigations. The bottom line is that they were driven by extraordinary high levels of liquidity and large income increases in the Danish wartime economy in combination with a shortage of most consumer goods as well as low levels of new issues on the capital market. This created an excess demand which pressured domestic interest rates down under a high trading activity on secondary markets.[21] Furthermore, almost the exact same development with high levels of domestic liquidity and low and decreasing domestic government bond yields during the war was observed in other European countries that were also occupied by Nazi Germany.[22]

A complementary dataset for analyzing the impact of the price limits and trading halts practiced in Copenhagen was collected on a daily basis from the newspaper *Berlingske Tidende* for the period July 1, 1939–June 30, 1940, i.e., the period of the most important shocks to the microstructure. The data cover

[17] Including expected depreciation (measured as *ex post* forward rate) explicitly in this equation is difficult due to the long periods of fixed exchange rates between Sweden and Denmark (see Fig. 4), during which depreciation does not vary. However, most of the effect on spreads coming from expected depreciation should enter through the expected inflation differential.

[18] Prices come from Statistical Yearbook of Denmark (table *Københavns Børskurs (Køber) for Obligationer*) and the Swedish financial chronicle *Affärsvärlden*. During the closure of the Copenhagen exchange in April–May 1940, prices came from the OTC market (*Finanstidende* 22 May 1940, p. 700).

[19] For Sweden, the Bond Catalogues of the Swedish Banker's Association as well as *Affärsvärlden* were closely searched for any information about halted or stopped debt service. But as reported by the Danish newspaper *Finanstidende* in the mid-1940, the Danish government indeed sustained its debt service to foreign creditors unlike what could be expected (*Finanstidende* 12 Jun. 1940, p. 761).

[20] I also checked the results using other yield concepts (current yield, yield to average life) and bonds (Copenhagen: 3.5% consol of 1888; Stockholm: 3.5% 20-year loan of 1938) without finding any notable effect on the results.

[21] For detailed discussions of the Danish wartime economy and the evolution of domestic interest rates, see Olsen (1962, p. 27), Johansen (1986, p. 87) and Nyboe Anderson (1947, pp. 272–288).

[22] See Oosterlinck (2000, 2003) for studies of the wartime yields of French and Belgian domestic debt.

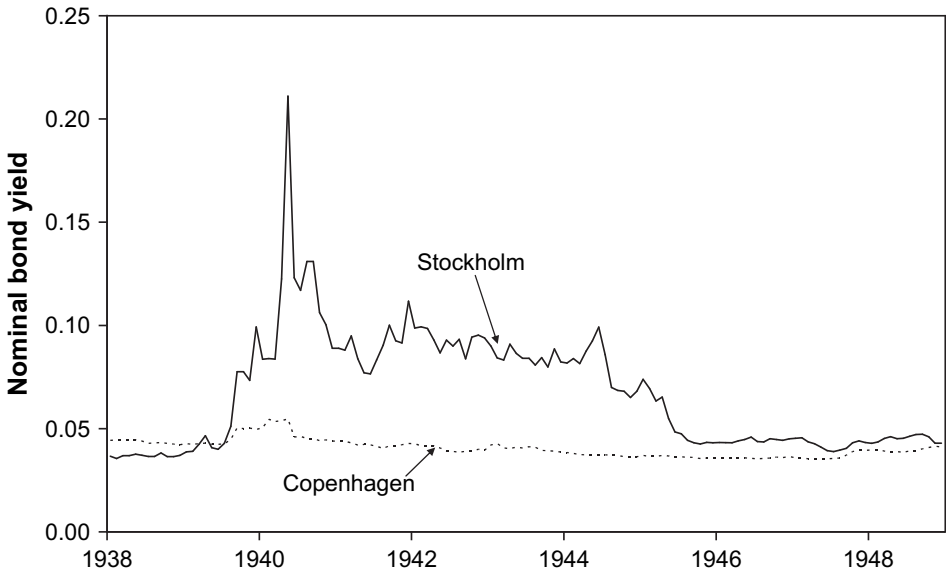

Fig. 2. Danish long-term government bond yields as quoted in Copenhagen and Stockholm, 1938–1948. *Sources:* See text.

daily prices and volumes for three different kinds of bonds: one government bond (issued in 1934, see above) and two 4% bonds issued by the local credit associations in Copenhagen and Østifterne.[23]

Data on market interest rates are based on the official central bank discount rates from both countries. Nominal market portfolio returns are monthly stock market capital gains with real returns calculated by deflating these returns with monthly inflation (see below). These two variables are shown in Fig. 3.

Expected inflation rates are based on monthly cost of living indices, *CLI*, for Denmark (Statistics Denmark) and Sweden (Statistics Sweden), with the expected annual inflation rate over the coming n months being $\pi_{t+n} = [(CLI_{t+n} - CLI_t)/CLI_t]^{12/n}$, where the ratio in the exponent annualizes the inflation rate. While most studies set $n = 12$ to get a straightforward measure of annual inflation expectation, the bond yields assume that bond are held until they mature (as in "yield to maturity"), implying a much larger n. In order to avoid the ambiguity of this measurement issue, I use both $n = 12$ and $n = [120, 252]$, corresponding to the period 1938–1948 during which n descended from 252 (21 years) to 120 (10 years) (see Fig. 4). The *ex post* rate of the expected inflation difference between markets for debt types E and D (based on RIP underlying Eq. (2)) then equals $\pi_{E,t+n} - \pi_{D,t+n} = (\pi^e_{E,t+n} - \pi^e_{D,t+n}) + \varepsilon_t$. Using changes in *CLI* as an inflation proxy may be problematic, since both Denmark and Sweden practiced commodity price controls for most of the wartime period. But replacing the *CLI* with a nominal stock market index, which is arguably better for capturing especially high levels of "true" inflation, does not cause any significant differences in the main findings of the study.

5. Econometric results

Table 3 displays the results from the estimations using nominal (Eq. (1)) and real (Eq. (2)) sovereign spreads. The main finding is that the spread between Danish external and domestic government yields responded significantly to the default cost shocks displayed in Table 2 and, importantly, in a way consistent with the predictions of the domestic default cost models of Drazen (1998) and others. In particular, the outbreak of World War II significantly increased sovereign risk spreads from pre-war levels by between 250 and 370 basis points (*T(War)*), depending on the specification. This effect is in

[23] These two loans were selected as they were described as the most "popular" among Danish investors and hence, an upper bound on trading volumes. In the bond lists, they were denoted as follows: *Kjøbenhavns Kreditforening* (1933–2007, 9 S.) and *Østifternes Kreditforening* (1934–2009, 14 S.)

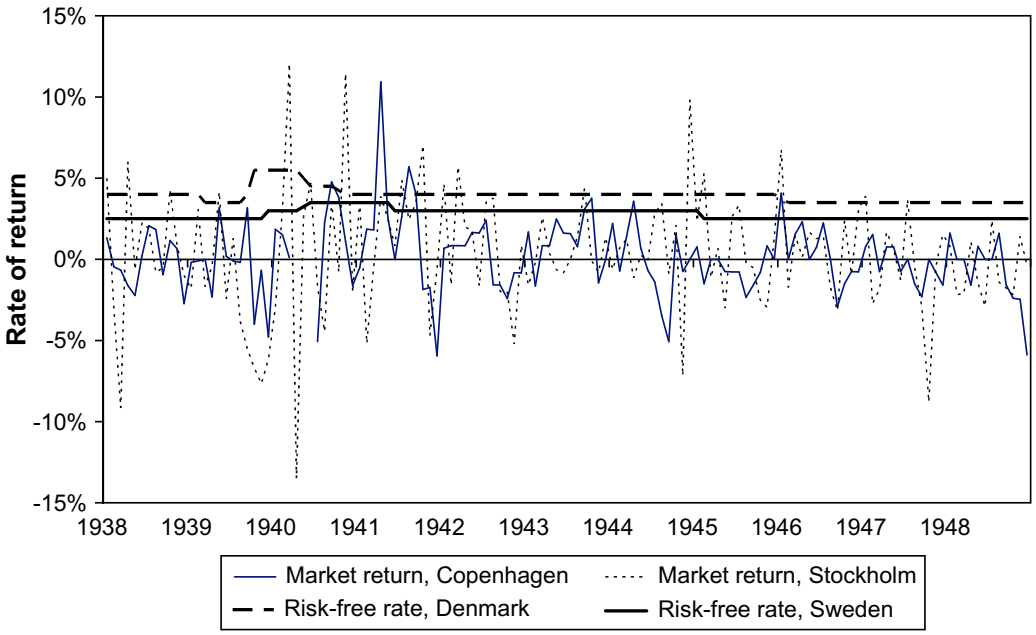

Fig. 3. Returns on the risk-free rate and stock market portfolio in Copenhagen and Stockholm, 1938–1948. Notes: Market portfolio returns are nominal capital gains on the composite stock price indexes recorded on the Copenhagen and Stockholm Stock Exchanges. Risk-free rates are the discount rates of each country's central bank. For sources, see text.

line with the reduction of the relative external default cost as explained in Section 4 and Table 2. The second severe political shock was the German invasion of Denmark in April 1940, which was followed by three years of German occupation. As stated in Table 2, the domestic political situation was largely unchanged and domestic default costs hence remained high. By contrast, expected external default

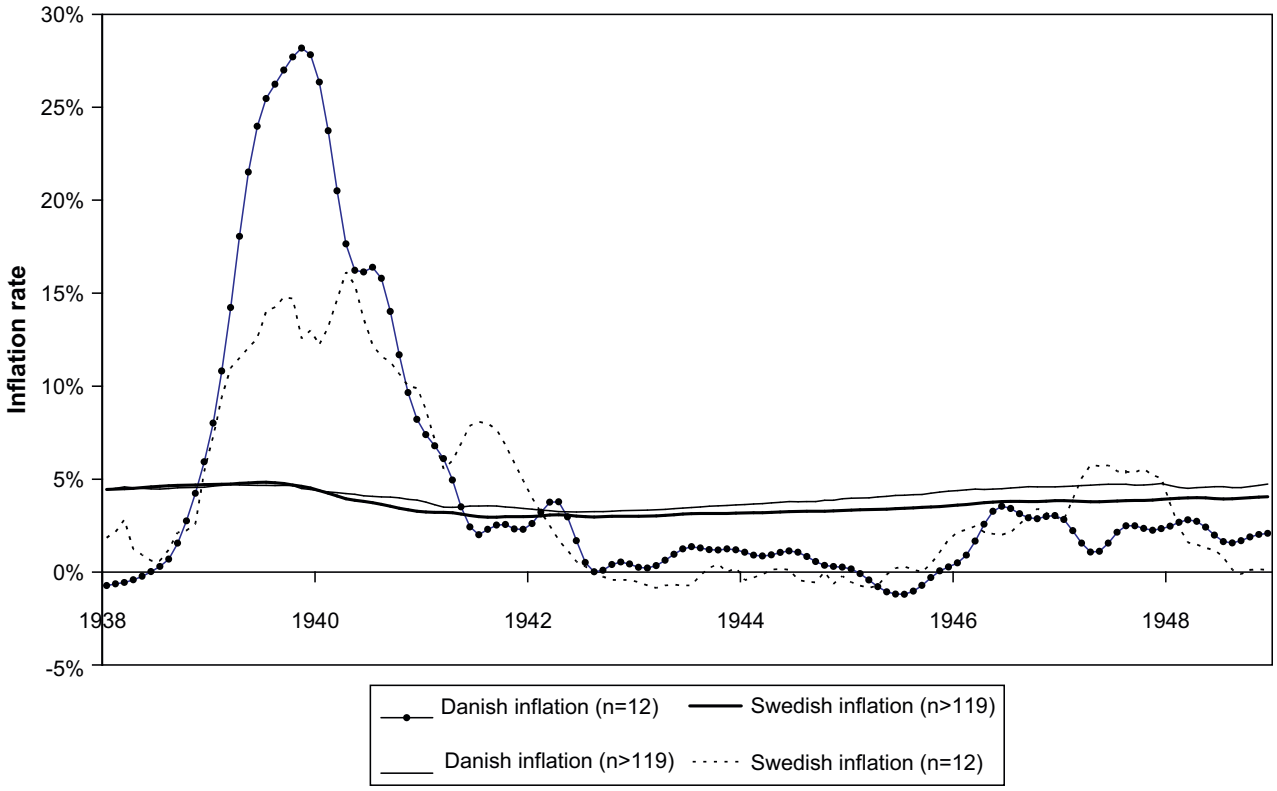

Fig. 4. Inflation rates in Sweden and Denmark, 1938–1948. *Sources:* See text.

costs dropped further as a result of the new political and fiscal influence of the notorious defaulter Germany. Fully in line with this prediction, the estimated change in sovereign risk spread, i.e., *T(Occupation) – T(War)*, showed an increase by between 150 and 340 basis points.

The third wartime shock to relative sovereign default costs was when Germany dissolved the Danish government and proclaimed martial law in late August 1943. According to Table 2, this event reduced domestic default costs, while it did not affect the already low external default costs. Hence, the relative cost of a domestic default decreased, which is precisely what the point estimate *T(Martial) – T(Occupation)* indicates, namely a decrease in sovereign risk spread by 270–370 basis points. The last wartime shock according to Table 2 was the end of the war in May 1945, which basically restored Danish pre-war debt servicing policies and thereby, roughly equalized expected default costs across debt types. The estimates in Table 3 fully reinforce this picture by reporting a decrease in the sovereign risk spread, *T(Martial) – T(Peace)*, by between 260 and 360 basis points. This drop eliminated the remaining wartime spread and hence, supports the theoretical and historical predictions of Table 2.

All regression constants are small and, expect in one case, insignificantly different from zero. This indicates that sovereign spread were virtually zero during periods of full market integration. Furthermore, a zero intercept is fully in line with for the theoretical predictions of the RIP (in the real spread estimations). As for market interest rate differentials, they are positively related to the real spreads estimations and largely insignificant (though with a positive sign) in the case of the nominal spread. The difference between market portfolio returns, finally, seems to have no effect at all on government bond spreads. While somewhat surprising, this may simply reflect the relatively high variation in market returns as indicated in Fig. 3.

6. Robustness checks

6.1. Controlling for microstructure

If the wartime price limits practiced on the Copenhagen Stock Exchange influenced quoted market yields, this could mean that the results from the spreads estimations are flawed (Charemza and Majerowska, 2000). I examine if this was the case by analyzing the daily price movements and trading

Table 3
Sovereign spreads and relative default costs, 1938–1948.

	$NomSpread_{ED}$		$RealSpread_{ED}$			
	(1)	(2)	(3)	(4)	(5)	(6)
T(War)	0.036*** (0.006)	0.031*** (0.004)	0.039*** (0.005)	0.039*** (0.006)	0.131*** (0.024)	0.031*** (0.004)
T(Occupation)	0.058*** (0.005)	0.064*** (0.007)	0.056*** (0.005)	0.058*** (0.006)	0.041 (0.027)	0.069*** (0.007)
T(Martial)	0.035*** (0.004)	0.036*** (0.004)	0.034*** (0.003)	0.036*** (0.004)	0.021 (0.025)	0.042*** (0.004)
T(Peace)	0.008*** (0.002)	0.009*** (0.002)	0.007*** (0.002)	0.010** (0.004)	−0.021 (0.025)	0.017*** (0.002)
NomIntDiff	0.416 (0.390)					
NomMarkDiff	0.013 (0.026)					
RealIntDiff			1.004*** (0.046)	0.666* (0.342)		
RealMarkDiff			0.028 (0.020)	0.017 (0.026)		
Constant	0.004 (0.005)	−0.001 (0.002)	0.011*** (0.001)	0.007 (0.005)	0.021 (0.024)	−0.003 (0.002)
n (months in inflation horizon)			12	(120,252)	12	(120,252)
Observations	129	132	129	129	132	132
F-statistic	85.7	36.9	459.2	102.3	60.0	53.9
R^2	0.87	0.75	0.96	0.87	0.56	0.75

Note: Dependent variables are nominal ($NomSpread_{ED}$) and real ($NomSpread_{ED}$) spreads between Danish long-term external and domestic government bonds based on market prices in Stockholm and Copenhagen. *T* denotes time dummies following Table 2, NomIntDiff and RealIntDiff are the nominal and real differentials between Swedish and Danish central bank discount rates, and NomMarkDiff and RealMarkDiff the same for stock market returns. *n* is the inflation horizon in numbers of months, either 12 (annual) or between 120 and 252 (10–21 years) as described in Section 4. ***, ** and * denote statistical significance at the 1%-, 5%- and 10%-levels, respectively. Newey and West (1987) heteroskedasticity and autocorrelation consistent standard errors with maximum 6 lags are in parentheses.

volumes of three individual bond loans in Copenhagen, one governmental (Fig. 5a) and two issued by local credit associations (Fig. 5b and c). Except for the weeks after the war outbreak in September 1939, when trading vanished due to a rigid price floor restriction (see Table 1), trading were active and prices freely fluctuating throughout the period between mid-1939 and mid-1940. Contemporary sources confirm this picture.[24] Hence, the wartime price limits in Copenhagen had no lasting effect on recorded price levels and should therefore not be of any significance to the main spread analysis of this paper.

6.2. Controlling for risk aversion

Another explanation to having large sovereign spreads across debt typs that does not involve any default risk differentials is differences in risk aversion across investor groups. This explanation originates from Roubini (2001) in his explanation of spikes in the recent sovereign spreads (over the U.S. yield) for countries with default-free histories and otherwise well-behaved fundamentals. I evaluate this alternative hypothesis by estimating risk premiums of the investors on both domestic (Danish) and foreign (Swedish) markets using different variants of a single-asset time series CAPM. Since government bonds are not often treated as the risky asset in CAPM, I employ two concepts of bond returns to avoid any measurement problems: monthly yields and monthly holding period returns.[25] The wartime segmentation of Scandinavian bond markets necessitates the use of two different types of market portfolios. Whenever markets were segmented, I use a local stock market portfolio which means estimating a standard CAPM with domestic yields and market returns for both countries. When markets were integrated, however, I calculate a "Scandinavian" stock market portfolio since investors may have held securities in both markets. This portfolio includes returns from both the Copenhagen and Stockholm markets at equal weights. Then an international CAPM is fitted (Karolyi and Stulz, 2003). Returns are throughout converted into home currencies, i.e., DKK (SEK) for Danish (Swedish) investors:

$$z_t = \alpha_k + z^L_t \beta_k + \nu_t, \quad k = Full,\ Prewar,\ War,\ Postwar, \tag{3}$$

$$z_t = \alpha_k + z^S_t \beta_k + \nu_t, \quad k = Full,\ Prewar,\ War,\ Postwar, \tag{4}$$

where $z_t \equiv h_t - r_t$ is the excess return on Danish government bonds, $z^L{}_t \equiv R^m{}_t - r_t$ the excess return on the local portfolio, $z^S_{it} \equiv R^{mS}{}_t - r_t$ the excess Scandinavian market return, α_k constants, β_k beta for periods $k =$ "Full" (1938:1–1948:12), "Prewar" (1938:1–1939:8), "War" (1939:9–1945:5) and "Postwar" (1945:6–1948:12) and ν_t a random error. The sample sizes are arguably small and to handle this, I use bootstrapped standard errors with 2000 replications for each sub-period. Moreover, outliers cause heteroskedastic and non-normal residuals, and to account for this, I fit robust CAPM regressions throughout.[26] Finally, it should be noted that single-asset CAPM regressions are inherently noisy, and the overall goodness of fit is therefore expected to be relatively low.

The results in Table 4 clearly show that the variation in the estimated betas across time periods and countries is small, with the Danish betas being slightly larger than the Swedish ones. In other words, the recorded asset returns do not indicate any spikes in risk aversion among either Danish or Swedish investors during this time period, hence rejecting Roubini's (2001) alternative explanation. The result holds across all specifications of the CAPM model ("Local" or "Scandinavian") and the concept of bond returns (yield or holding period return).

[24] Contemporary news writings describe how volumes vanished in September 1939 (see *Finanstidende* 20 Sep. 1939, p. 1058; *Obligationstidende* 27 Sep. 1939) but resumed thereafter (*Obligationstidende* 5 Jun. 1940, p. 17).

[25] Monthly holding period returns to bonds may be more comparable to the monthly stock returns used. They are calculated as $h_t = (C_t + P_t - P_{t-1})/P_{t-1}$ for monthly accrued coupon C_t and bond price P_t.

[26] Robust regressions basically eliminate gross outliers by computing Huber-biweight iterations that allow observations to be weighted more evenly in the loss function.

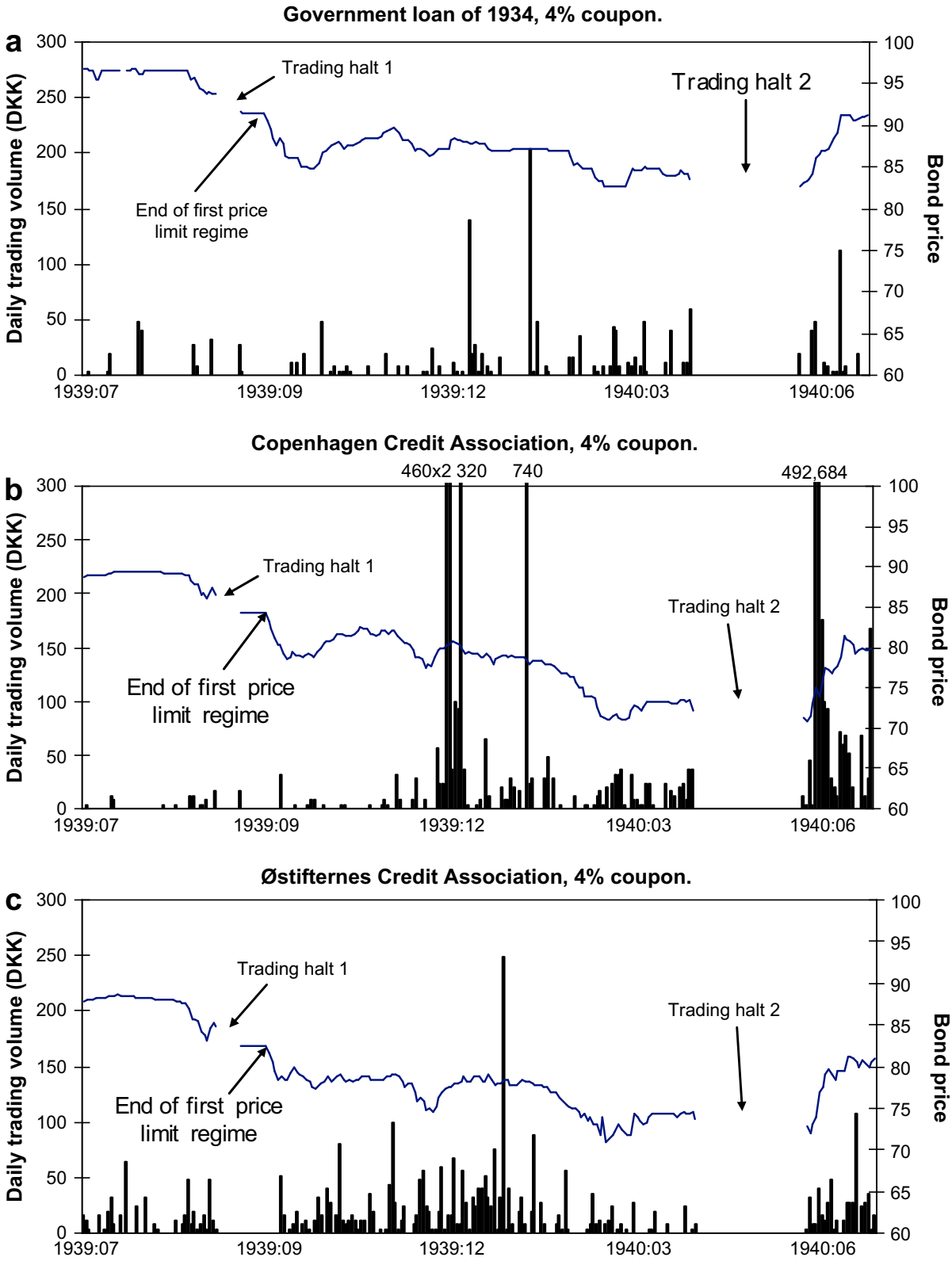

Fig. 5. Daily prices and volumes at the Copenhagen Stock Exchange, 1939–1940. *Source:* Daily market reports in the newspaper *Berlingske Tidende*.

7. Concluding remarks

This paper examines how sovereign risk depends on the location of trade and the nationality of investors, as suggested by a recent strand of sovereign debt research. Specifically, I analyze market

Table 4
Risk aversion of Danish and Swedish bond investors, 1938–1948.

Period (k), Market (i)	CAPM	Sovereign yields			Holding period returns			Obs.
		α_{ik}	β_{ik}	$Pr.>F$	α_{ik}	β_{ik}	$Pr.>F$	
k = Full (1938:1–1948:12)								
i = Copenhagen	Local	0.001*** (0.000)	0.024*** (0.008)	0.004	0.001** (0.000)	0.082*** (0.022)	0.000	129
	Scandinavian	0.001* (0.000)	0.015* (0.021)	0.064	0.001* (0.000)	0.074*** (0.021)	0.001	129
i = Stockholm	Local	0.002*** (0.000)	0.005 (0.005)	0.319	0.006* (0.003)	0.062 (0.086)	0.475	132
	Scandinavian	0.002* (0.000)	0.019 (0.132)	0.0153	0.005* (0.003)	0.012 (0.132)	0.926	129
k = Prewar (1938:1–1939:8)								
i = Copenhagen	Local	0.000 (0.000)	0.002 (0.007)	0.214	0.002 (0.002)	0.128 (0.110)	0.167	20
	Scandinavian	0.001*** (0.000)	0.000 (0.007)	0.680	0.002 (0.002)	0.114 (0.099)	0.064	20
i = Stockholm	Local	0.001*** (0.000)	0.000 (0.003)	0.903	0.004 (0.006)	0.161 (0.378)	0.176	20
	Scandinavian	0.001*** (0.000)	0.000 (0.004)	0.969	0.002 (0.002)	0.313 (0.531)	0.077	20
k = War (1939:9–1945:5)								
i = Copenhagen	Local	0.003*** (0.000)	0.009 (0.010)	0.233	0.002*** (0.001)	0.086*** (0.036)	0.016	66
	Scandinavian	0.003*** (0.000)	0.008 (0.009)	0.303	0.002** (0.001)	0.073 (0.047)	0.046	66
i = Stockholm	Local	0.004*** (0.012)	0.002 (0.007)	0.630	0.020* (0.012)	0.025 (0.445)	0.909	69
	Scandinavian	0.004*** (0.000)	0.007 (0.007)	0.303	0.020* (0.011)	0.090 (0.635)	0.795	66
k = Postwar (1945:5–1948:12)								
i = Copenhagen	Local	0.000*** (0.000)	0.002 (0.002)	0.294	0.000 (0.000)	0.029 (0.039)	0.387	43
	Scandinavian	0.000*** (0.001)	0.001 (0.001)	0.286	0.000** (0.001)	0.015 (0.050)	0.597	43
i = Stockholm	Local	0.001* (0.001)	0.001 (0.001)	0.162	0.002 (0.001)	0.067 (0.043)	0.212	43
	Scandinavian	0.001*** (0.000)	0.002 (0.001)	0.202	0.001 (0.001)	0.008 (0.065)	0.922	43

Note: Huber-Biweight robust CAPM regressions (6a) and (6b) with bootstrapped standard errors (with 2000 replications) for all sub-periods. Dependent variable is excess return (either sovereign yields or holding period returns) on Danish sovereign debt over the risk-free rate. "Local" and "Scandinavian" CAPM refer to the use of either a local portfolio or an equally-weighted Copenhagen-Stockholm portfolio. Subscript i is market place and k is periods "Full", "Prewar", "War" and "Postwar". [a], [b] and [c] denote significance at the 1%-, 5%- and 10%-levels, respectively.

yields on Danish government debt, continuously traded in Denmark and Sweden during 1938–1948, a period full of political shocks and also a wartime segmentation of capital markets in Scandinavia. By linking the exogenous wartime shocks to changes in the costs of domestic and external sovereign defaults, I find that these costs explain a significant part of the variation in the sovereign risk spread across markets. This finding is robust to a multitude of tests and the inclusion of additional factors potentially driving the yield spread, such as differences in macroeconomic fluctuations, portfolio allocation opportunities, local risk aversion and microstructure institutions.

Altogether, this is one of the first studies that provides an empirical backing to the recent literature on sovereign debt of, e.g., Drazen (1998), Reinhart et al. (2003) and Reinhart and Rogoff (2008), that emphasizes the importance of both domestic and external government debt and, in particular, that sovereigns may choose strategically on which of these debts to default depending the size of their political and economic costs.

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References

Affärsvärlden, Various issues. Stockholm.
Algott, S., 1963. Stockholms Fondbörs 100 år. AB Nordiska Bokhandeln, Stockholm.
Berlingske Tidende, Various issues. Copenhagen.
Bordo, M., Oosterlinck, K., 2005. Do political changes trigger debt default? And do defaults lead to political changes? Paper presented at the Conference on the Political Economy of International Finance PEIF.
Bulow, J., Rogoff, K., 1989a. A constant recontracting model of sovereign debt. Journal of Political Economy 97 (1), 155–178.
Bulow, J., Rogoff, K., 1989b. Sovereign debt: is to forgive to forget? American Economic Review 97 (1), 43–50.
Charemza, W.W., Majerowska, E., 2000. Regulation of the Warsaw stock exchange: the portfolio allocation problem. Journal of Banking and Finance 24 (4), 555–576.
Chinn, M.D., 2005. The (partial) rehabilitation of interest rate parity in the floating era: longer horizons, alternative explanations, and emerging markets. Journal of International Money and Finance 25 (1), 7–21.
Cuthbertson, K., 1996. Quantitative Financial Economics. Stocks, Bonds and Foreign Exchange. Wiley, Chichester.
Di Gioacchino, D., Ginebri, S., Sabani, L., 2005. Public debt repudiation in a monetary union: the role of the geographical allocation of domestic debt. Working Paper No. 81. Università Degli Studi Di Roma La Sapienza, Rome.
Drazen, A., 1998. Towards a political-economic theory of domestic debt. In: Calvo, G., King, M. (Eds.), The Debt Burden and its Consequences for Monetary Policy: Proceedings of a Conference held by the International Economic Association at the Deutsche Bundesbank, Frankfurt, Germany. St. Martin's Press, New York, NY.
Eaton, J., Gersovitz, M., 1981. Debt with potential repudiation: theoretical and empirical analysis. Review of Economic Studies 48 (2), 289–309.
Finanstidende. Various issues, Copenhagen.
Gejl, I., 1989. Indenfor snorene. Fondbørsvekselerernes historie – især til 1945. Erhvervsarkivet, Aarhus.
Gelpern, A., Setser, B., 2004. Domestic and external debt: the doomed quest for equal treatment. Georgetown Journal of International Law 35 (4), 795–814.
Hilscher, J., Nosbusch, Y., 2008. Determinants of sovereign risk: macroeconomic fundamentals and the pricing of sovereign debt. Unpublished Working Paper, Brandeis University, Waltham, MA.
Hoffmeyer, E., 1968. Perioden 1931–1960. In: Svendsen, K.E., Hansen, S.A., Olsen, E., Hoffmeyer, E. (Eds.), Dansk pengehistorie 1700–1960, Bind 2. Danmarks Nationalbank, Odense, pp. 1914–1960.
Jackson, P.S., Lothian, J.R., 1993. The behavior of bond yields across exchange-rate regimes and the integration of capital markets. Greek Economic Review 15 (2), 1–28.
Johansen, H.C., 1986. The Danish Economy in the Twentieth Century. Croom Helm, London.
Karolyi, A.G., Stulz, R.M., 2003. Are financial assets priced locally or globally? In: Constantidines, G., Harris, M., Stulz, R.M. (Eds.), Handbook of the Economics of Finance. North-Holland, Amsterdam.
Kletzer, K.M., Wright, B.D., 2000. Sovereign debt as intertemporal barter. American Economic Review 90 (3), 621–639.
Kohlscheen, E. Sovereign risk: constitutions rule. Oxford Economic Papers, in press.
Lidegaard, B., 2005. Kampen om Danmark 1933–1945. Gyldendal, Copenhagen.
Longstaff, F.A. Financial claustrophobia. Asset pricing in markets with illiquid assets. American Economic Review, in press.
Lothian, J.R., 2002. The internationalization of money and finance and the globalization of financial markets. Journal of International Money and Finance 216, 699–724.

Lothian, J.R., Wu, L., 2005. Uncovered interest rate parity over the past two centuries. Unpublished Working Paper, GSB Fordham University, New York, NY.
Mauro, P., Sussman, N., Yafeh, Y., 2002. Emerging market spreads: then versus now. Quarterly Journal of Economics 117 (2), 695–733.
Mitchener, K.J., Weidenmier, M.D., 2010. Supersanctions and sovereign debt repayment. Journal of International Money and Finance 29 (1), 19–36.
Newey, W.K., West, K.D., 1987. A simple positive semi-definite, heteroscedasticity and autocorrelation consistent covariance matrix. Econometrica 55 (3), 703–708.
Nyboe Anderson, P. (Ed.), 1947. Laanerenten. En teoretisk og historisk undersøgelse med særligt henblik paa renteudviklingen i Danmark. Nyt Nordisk Forlag, Copenhagen.
Obligationstidende. Various issues, Copenhagen.
Obstfeld, M., Taylor, A.M., 2003. Sovereign risk, credibility and the gold standard: 1870–1913 versus 1925–31. Economic Journal 113 (487), 1–35.
Ohlin, B., 1941. Kapitalmarknad och räntepolitik. KF, Stockholm.
Olsen, E., 1962. Danmarks økonomiske historie siden 1750. Copenhagen University, Copenhagen.
Oosterlinck, K., 2000. Les anticipations des marchés obligataires belges de 1939 à 1944. Cahiers d'Historie du Temps present 6, 151–182.
Oosterlinck, K., 2003. The bond market and the legitimacy of Vichy France. Explorations in Economic History 40 (4), 326–344.
Oosterlinck, K., Landon-Lane, J.S., 2006. Hope springs eternal – French bondholders and the Soviet Repudiation 1915–1919. Review of Finance 10 (4), 1–29.
Reinhart, C., Rogoff, K.S., 2008. The forgotten history of domestic debt. NBER Working Paper no. 13946. Cambride, MA.
Reinhart, C., Rogoff, K.S., Savastano, M.A., 2003. Debt Intolerance. Brookings Papers on Economic Activity 1, 1–74.
Roubini, N., 2001. Why should the foreign creditors of Argentina take a greater hit/haircut than the domestic ones: on the economic logic, efficiency, fairness and legality of 'discriminating' between domestic and foreign debt in sovereign debt restructurings. Unpublished Working Paper. Stern School of Business, New York, NY.
Rose, A.K., 2005. One reason countries pay their debts: renegotiation and international trade. Journal of Development Economics 77 (1), 189–206.
Silber, W.L., 1991. Discounts on restricted stock: the impact of illiquidity on stock prices. Financial Analysts Journal 47 (4), 60–64.
Statistics Denmark, 1969. Kreditmarkedsstatistik. Statistiske undersøgelser Nr. 24, Copenhagen.
Svendsen, K.E., Hansen, S.A., Olsen, E., Hoffmeyer, E., 1968. Odense. In: Dansk pengehistorie 1700–1960, Bind 3. Danmarks Nationalbank. Bilag.
Tomz, M., 2004. Voter sophistication and domestic preferences regarding debt default. Unpublished Working Paper, Stanford University, Palo Alto, CA.
Van Rijckeghem, C., Weder, B., 2009. Political institutions and debt crises. Public Choice 138 (3–4), 387–409.
Valutakommittén, 1980. Valutareglering och ekonomisk politik. Expertrapporter från Valutakommittén, SOU 1980:51, Stockholm: Allmänna förlaget.
Waldenström, D., Frey, B.S., 2008. Did Nordic countries recognize the gathering storm of world war II? Evidence from the bond markets. Explorations in Economic History 45 (2), 107–126.