

Online Appendix (not for publication)

Institutional Setup of Government Bond Auctions

In this section we briefly discuss the institutional setup of German and Italian government bond auctions, also known as the primary markets. For more details, we refer to [AFME \(2017\)](#). The German Finance Agency is responsible for all public debt management functions in Germany. In Italy the government bond auctions are carried out by the Bank of Italy in collaboration with the Treasury of the Ministry of Economy and Finance. Only a specific group of investors is allowed to participate in the auction process. In Germany this group is the “Bund Issues Auction Group” and in Italy they are the “Authorized Dealers.” These so-called primary dealers have to meet specific requirements such as a minimum amount of successfully submitted bids within a year.²³ The German Treasury uses a multi-price auction process where the winning bids are allotted at the price specified in the bid. For the maturities we consider, the Italian Treasury employs a uniform price auction where the Treasury discretionarily sets the clearing price of the auction and the quantity issued within a range previously announced.

Both governments publish a yearly issuance calendar at the end of every year to inform investors about the auction dates in the upcoming year. Then, at the end of every quarter they publish an issuance schedule with information on the types of bonds and the volume to be issued. A few days (e.g. 6 working days in Germany and 3 working days in Italy) prior to the auction, the agencies post the exact maturity and volume of the bonds, specify the coupon rate and provide additional details. The Online Appendix shows a press release of an auction announcement of a 10-year German bond and a 10-year Italian bond (Figures [A5](#) and [A6](#)). Both documents clearly communicate the issuance volumes, coupon payments, the time frame when bids are accepted and the settlement date among other pieces of information. Finally, the German agency posts an invitation to bid the weekday prior to the tender, to inform about the timing of the auction.

On the day of German auctions, bidding starts at 8:00 am Central European Time (CET). Primary dealers can place their bids until 11:30 a.m., but before 2012 this was 11:00 a.m. Multiple bids at different prices can be placed, but bids must be of par value of no less than one million EUR. Bidders may also choose to issue non-competitive bids with no upper limit on the demanded amount. The price that these bidders must pay is the weighted average of the winning competitive bids. Whether these bids will be filled completely or not will be decided by the agency. Non-competitive bids accounts for around 30% of all bids. At 11:30 a.m. CET the agency collates the bids and decides on the allotment. The decision is made within roughly 5 minutes, after which bidders are notified and the results are published.

This document contains information on the amount of competitive and non-competitive bids received, the allotted volume, the resulting bid-to-cover ratio and the lowest and the average price of the allotted bonds (see Figure [A7](#) in the Online Appendix). In each auction, the German Treasury sets aside a part of the initially announced issuance volume for future secondary market operations. This amount is communicated in the same document.

The Italian auctions are organized in a very similar fashion.^{[24](#)} On the day of the auction, all authorized dealers are allowed to submit their bids through the Italian electronic interbank network. These bids can be continuously adjusted until the closing time, which is 11.00 a.m. After that, the bids collected and sent out to the Treasury Officer who sets the results, publishes the outcome and communicates it to the Bank of Italy. According to the Treasury, this process can take up to 15 minutes. A press statement is then uploaded to the agency's website. An example of these press releases is shown in the Online Appendix (Figure [A8](#)). The document contains the amount of bids received, the amount allotted, the resulting bid-to-cover ratio, the market clearing price the agency chooses and much more. The settlement of the securities is two working days following the auction. After posting the press release with the issuance volume, the Italian Treasury did not have any discretion regarding the allotment volume prior to 2008. It issued 100% of the quantity announced. After 2008 the Treasury allowed itself some flexibility, and now only announces a minimum and maximum amount to be allotted at the auctions. Nonetheless it rarely exercises this option, and most cases the maximum amount is allotted.

FIGURES AND TABLES

Figure A1. Government bond yields of the five largest euro area member country

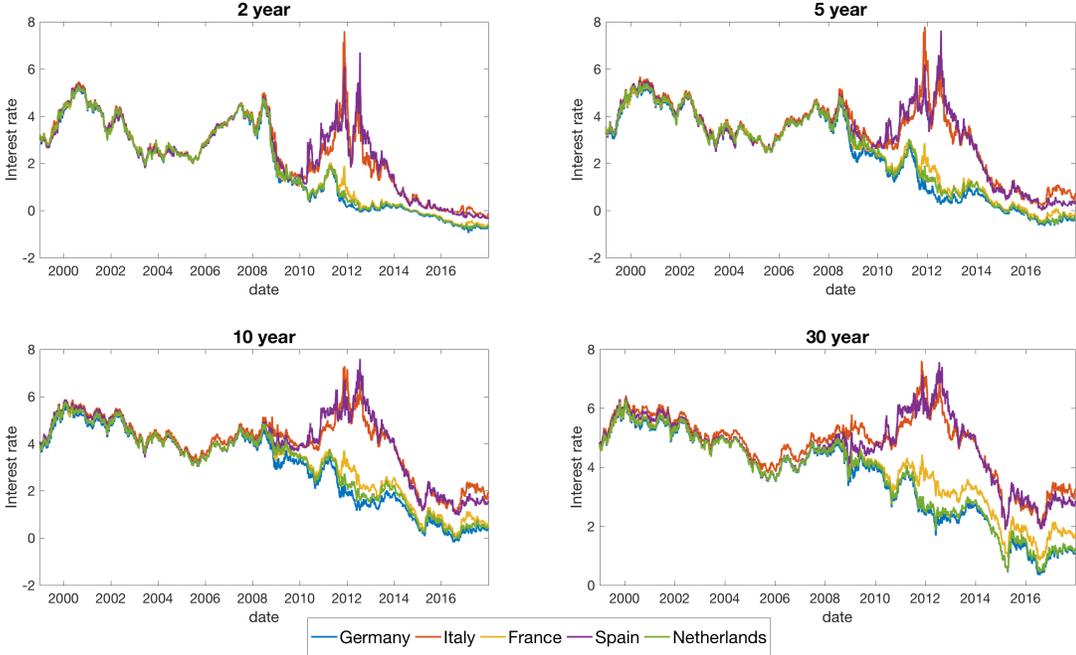
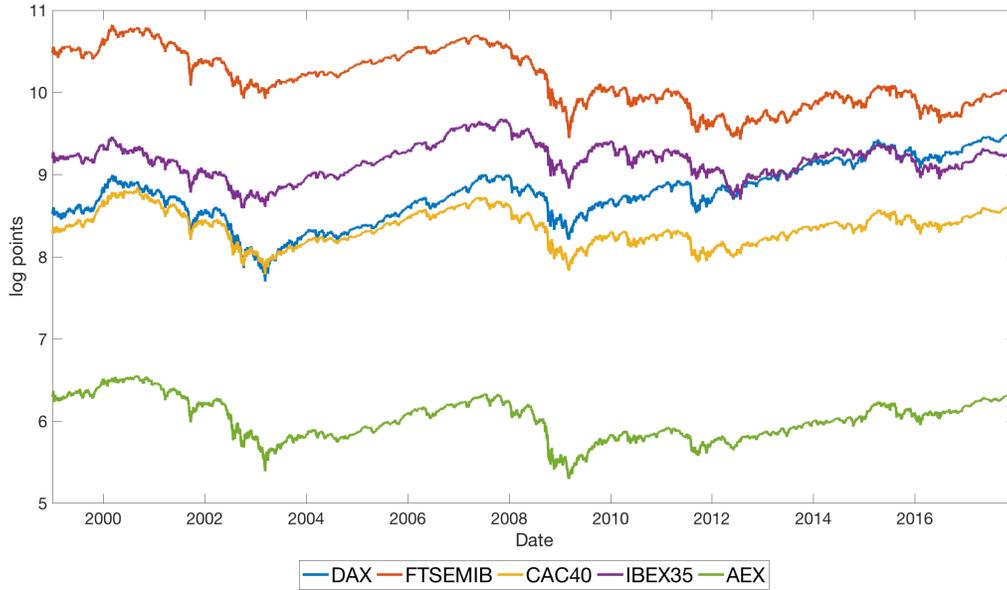


Figure A2. Stock indices of the five largest euro area member country



Note: Germany: DAX, Italy: FTSEMIB, France: CAC40. Spain: IBEX35, Netherlands: AEX. Values in logarithm

Figure A3. CDS spread on German and Italian 10-year government bond

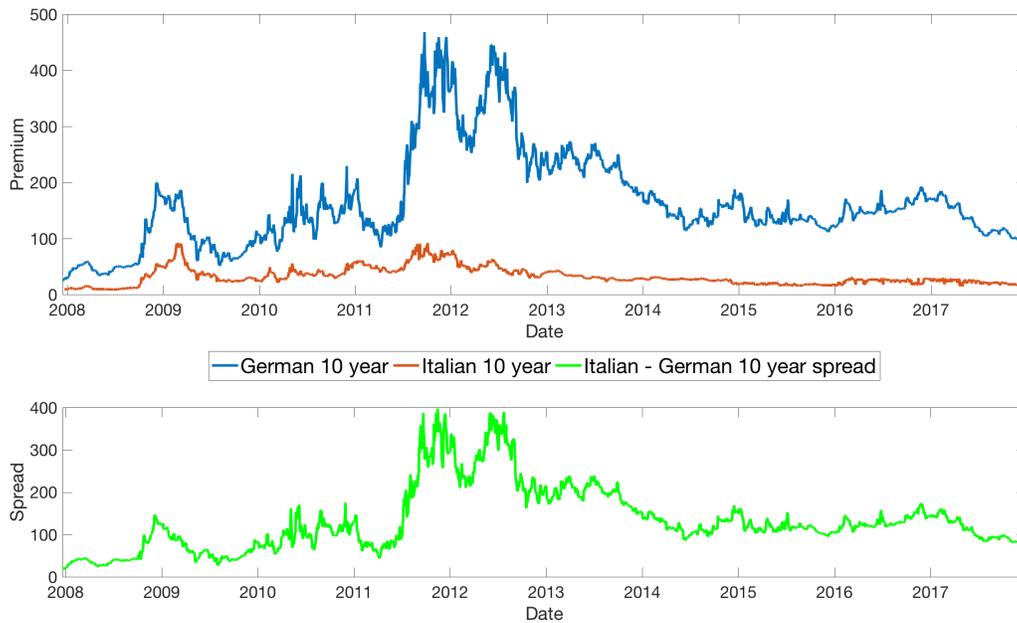


Figure A4. Country Level Index of Financial Stress (CLIFS) and its historical 70th percentile in Germany and Italy

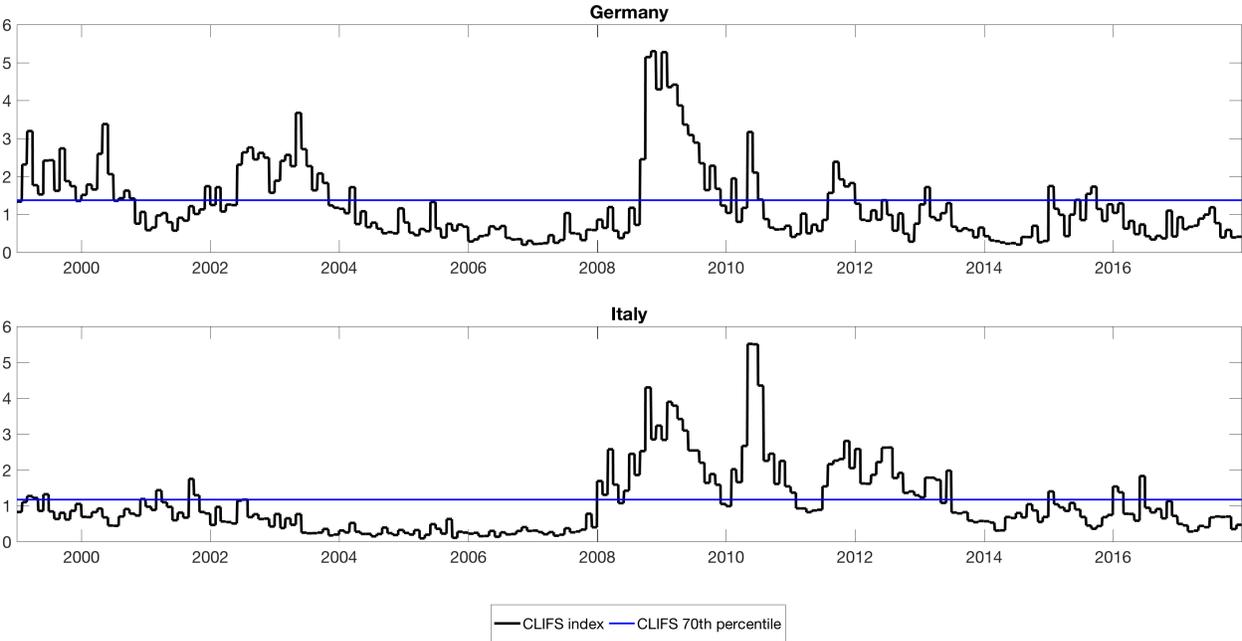


Figure A5. Announcement of the 11 January 2017 10-year German bond auction



Press release

Frankfurt am Main
3 January 2017
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Announcement of auction New 10-year Federal bond issue

As already announced in the issuance calendar for the first quarter of 2017, the Federal Government will launch a new bond issue (maturity: 15 February 2027) by auction on 11 January 2017. An issue volume (auction allotment and amount set aside for secondary market operations) of €5 billion is envisaged. Members of the Bund Issues Auction Group are entitled to bid.

Time schedule of the auction procedure:

Date of invitation to bid:	Tuesday, 10 January 2017
Bidding period:	Wednesday, 11 January 2017 from 8.00 a.m. until 11.30 a.m. Frankfurt time
Stock exchange listing:	Wednesday, 11 January 2017
Value date:	Friday, 13 January 2017

Characteristics of the Federal bond:

Maturity:	15 February 2027
Interest payment:	annually on 15 February, interest begins to accrue as of 13 January 2017
First interest payment:	15 February 2018 for 398 days
ISIN	DE0001102416

The nominal interest rate of the Federal bond will be published on the date of invitation to bid. In case of a nominal interest rate higher than zero the separate trading of registered interest and principal („stripping“) will be possible.

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Figure A6. Announcement of the 30 January 2017 10-year Italian bond auction



Ministero dell'Economia e delle Finanze

PRESS RELEASE

Medium-Long Term Issuances

The Ministry of Economy and Finance announces the following bonds' issuance and the relative subscription calendar:

Underwriting Deadline date for the Public	Deadline date for Presentation of bids in auction strictly prior to 11.00 am	Submission of bids for the supplementary auction no later than 3.30 pm on	Settlement date
January 27, 2017	January 30, 2017	January 31, 2017	February 1, 2017

Type	CCTeu	BTP 5 year	BTP 10 year
Year residual maturity	On the Run	On the Run	On the Run
ISIN Code	IT0005218968	IT0005216491	to be assigned
Tranche	7th	9th	1st
Issue date	Aug 15, 2016	Oct 03, 2016	Feb 01, 2017
Maturity date	Feb 15, 2024	Nov 01, 2021	Jun 01, 2027
Coupon	-	0.35%	2.20%
Nominal yield	0.561%	-	-
Spread	0.75%	-	-
Current coupon	0.287%	-	-
Coupon payment date	Feb 15, 2017	May 01, 2017	Jun 01, 2017(*)
Amount Min offered (mln. €)	1,750	2,250	3,500
Amount Max offered (mln. €)	2,250	2,750	4,000
Accrued coupon days	170	92	0
Placement fee	0.25%	0.25%	0.35%
% add. amount specialists	15%	15%	30%
Amount offered to Specialists (mln. €)	337.500	412.500	1,200.000

(*) First short coupon: 0,725275% with accrual period: 1 Feb 2017 - 1 Jun 2017 (120 days in a 182 semester).
 - After the first, the ordinary cycle will be: 1 Dec - 1 Jun.

The placement mechanism for the above mentioned bonds will be that of a uniform-price (marginal) auction with discretionary determination of allotment price and issued amount within the indicated issuance range.

The issued amount will be set excluding all the bids submitted at prices deemed not to be convenient given market conditions.

The following subjects are allowed to participate in the auction: Italian, EU and non-EU banks, financial brokers and EU and non-EU investment companies as indicated in each issuance decree. They submit bids for their own property or on their clients behalf.

Any bid submitted must contain the reference price. Every dealer can submit a maximum of five bids, which can differ from each other. The minimum bid is 500,000 euro. Any bid inferior to the minimum amount won't be considered. Any bid more than the whole amount offered will be allowed only up to that amount. Bid prices can vary by at least one cent of euro and different changes will be rounded up. Medium and long-term bonds can be subscribed for a minimum amount of 1,000 euro.

They are offered through a uniform-price (marginal) auction referred to the price, without any initial price reference. Dealers' bids have to be transmitted to Bank of Italy within the deadline, described in the "subscription calendar", using the National Interbanking Network with the technical modalities indicated by Bank of Italy itself and well-known by the dealers.

Figure A7. Press release of the 11 January 2017 10-year German bond auction results



Press release

Frankfurt am Main
11 January 2017
Page 1 of 1

Federal bond issue - Auction result -

The result of the auction of 11 January 2017 for the

0.25 % bond of the Federal Republic of Germany of 2017 (2027)
due on 15 February 2027
annual coupon date 15 February
interest begins to accrue on 13 January 2017
first interest payment on 15 February 2018 for 398 days
ISIN DE0001102416

was as follows:

Bids		€ 7,134.00 mn
Competitive bids	€ 1,570.00 mn	
Non-competitive bids	€ 5,564.00 mn	
Allotment		€ 4,017.70 mn
- Lowest accepted price	98.90 %	
- Weighted average price	98.91 %	
- Average yield	0.36 %	
- Allotment		
- for bids at the lowest accepted price	65 %	
- for non-competitive bids	55 %	
Cover ratio	1.8	
Amount set aside for secondary market operations (Own account of the Federal Government) ¹⁾		€ 982.30 mn
Issue volume		€ 5,000.00 mn

1) Placing by the German Finance Agency in the secondary market

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Figure A8. Press release of the 30 January 2017 10-year Italian bond auction results



Ministero dell'Economia e delle Finanze

Auction Results: 10 YEAR BTP
Date: January 30, 2017 - January 31, 2017

ISIN Code	IT0005240830
Tranche	1st - 2nd
Coupon(*)	2.20%
Issue Date	February 01, 2017
Maturity Date	June 01, 2027
Auction Date	January 30, 2017
Settlement Date	February 01, 2017
Amount Max Offered	4,000.000
Amount Min Offered	3,500.000
Amount Bid	5,147.463
Amount Allotted	4,000.000
Allotment Price	98.58
Bid To Cover Ratio	1.29
Gross Yield	2.37%
Accrued Coupon Days	-
Placement Fee	0.35%
Price for Individual Investors	98.580000
Price for fiscal purpose	98.580
Amount Offered to Specialists	1,200.000
Amount Bid to Specialists	2,982.040
Amount Allotted to Specialists	1,200.000

Issue Volume

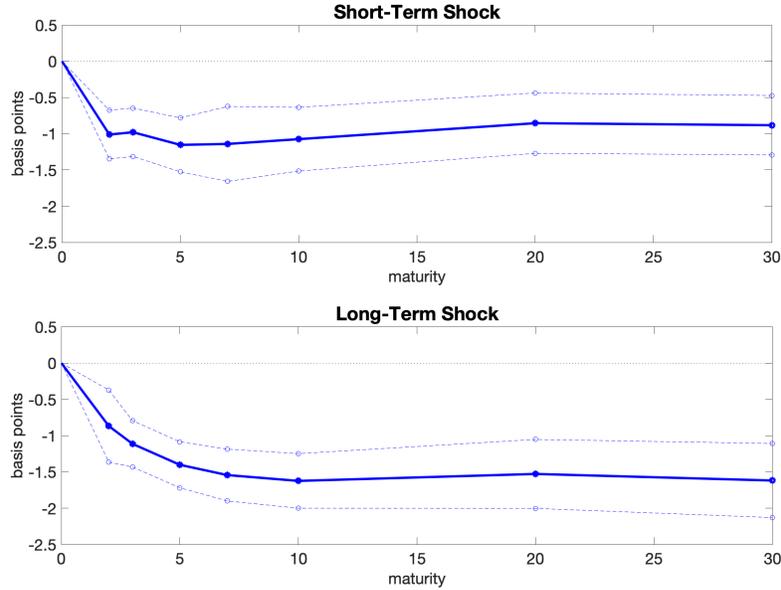
Outstanding	5,200.000
Amounts allotted to Specialists in supplementary placements and/or syndacated	1,200.000

(*) First short coupon: 0.725275% with accrual period: 1 Feb 2017 - 1 Jun 2017 (120 days) - After the first, the ordinary cycle will be: 1 Dec - 1 Jun

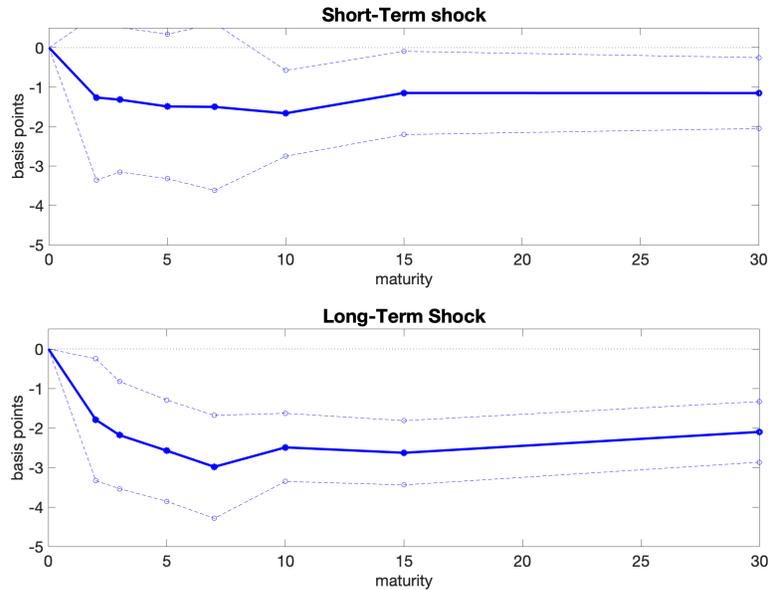
*Nominal Amounts are expressed in millions of Euros.
 Gross Yields are calculated on 365 days basis.*

Figure A9. On impact response of the Treasury yield curve (Bid-to-cover IV regression)

Panel A: Germany

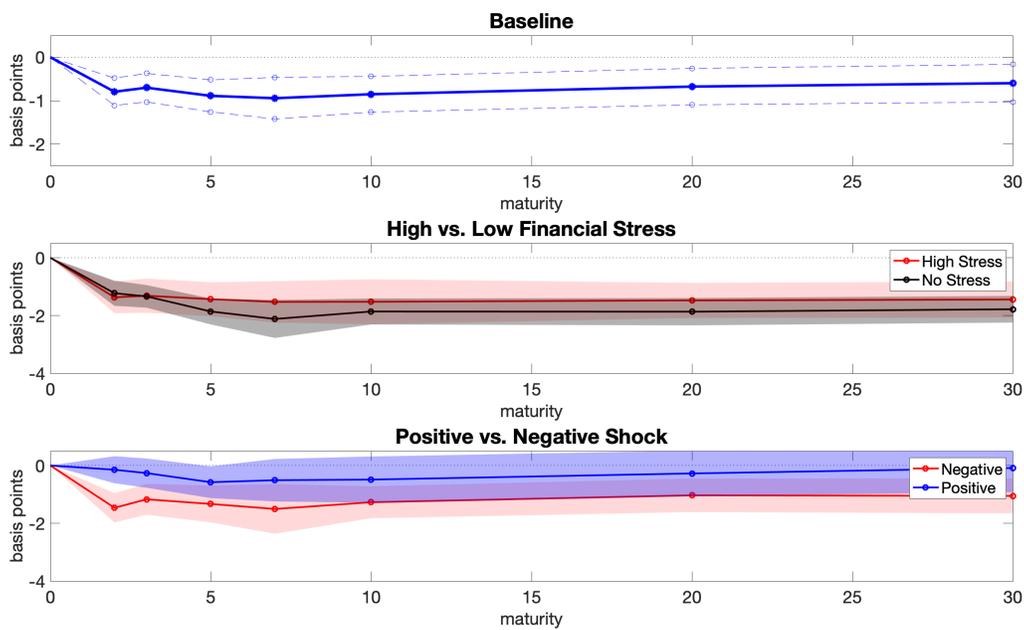


Panel B: Italy



Note: Nodes are the estimated β coefficients from the equation $\Delta R_t = \alpha + \beta \hat{D}_t^{(m)} + \epsilon_t$, for $m \in \{short, long\}$. $\hat{D}_t^{(long)}$ is $D_t^{(long)}$ instrumented by 10 and 30-year auction bid-to-cover and yield gap expected and surprise values, controlling for two lags of the total bid-to-cover ratio. $\hat{D}_t^{(short)}$ is instrumented similarly, using 2 and 5-year auctions. The surprise components obtained as the residuals of univariate AR(4) models. For Italy $D_t^{(short)} = D_t^{(2Y)}$ and $D_t^{(long)} = D_t^{(10Y)}$. $\hat{D}_t^{(m)}$ is then normalized to zero mean, unit variance. Dashed lines are 90% Newey-West confidence intervals.

Figure A10. On impact response of the German Treasury yield curve to the rotated short-term shock



Note: See Figure 6, 7 and 8. $D_t^{(short)}$ is rotated to be uncorrelated with $D_t^{(30Y)}$ and normalized to have zero mean and unit variance.

Table A1: Retained volume in German auctions explained by demand

	(1)	(2)	(3)	(4)	(5)
	2 year	5 year	10 year	30 year	All
Intercept	0.214*** (0.009)	0.246*** (0.014)	0.247*** (0.012)	0.338*** (0.032)	0.243*** (0.006)
Bid-to-cover	-0.029*** (0.005)	-0.042*** (0.009)	-0.046*** (0.008)	-0.115*** (0.024)	-0.043*** (0.004)
Observations	172	142	167	59	540
R^2	0.162	0.135	0.155	0.286	0.172

Note: Regressions of total amount of bids on the retained amount, both scaled by the targeted volume. Column (1) restricts the sample to include only auctions of 2-year bonds, Column (2) restricts the sample to include only auctions of 5-year bonds, (3) restricts the sample to include only auctions of 10-year bonds, (4) restricts the sample to include only auctions of 30-year bonds. Column (5) includes auction with all maturities. Standard errors in parentheses, (*), (**) and (***) denote statistical significance at 10, 5 and 1% respectively.

Table A2: Auction results and high-frequency surprises: Germany

Panel (A): Total bid-to-cover ratio and yield gap					
	(1)	(2)	(3)	(4)	(5)
	$D_t^{(2Y)}$	$D_t^{(5Y)}$	$D_t^{(10Y)}$	$D_t^{(30Y)}$	D_t
Bid-to-Cover	0.007**	0.045***	0.106***	0.141	0.059***
	(0.003)	(0.013)	(0.020)	(0.124)	(0.021)
Yield gap	-0.063**	-0.192*	-0.608***	-2.946**	-0.033***
	(0.031)	(0.099)	(0.215)	(1.376)	(0.005)
Observations	170	140	163	48	536
R^2	0.099	0.146	0.252	0.165	0.085
Panel (B): Expected and surprise components					
	(1)	(2)	(3)	(4)	(5)
	$D_t^{(2Y)}$	$D_t^{(5Y)}$	$D_t^{(10Y)}$	$D_t^{(30Y)}$	D_t
Bid-to-cover (exp.)	-0.003	0.019	0.123**	0.007	0.045
	(0.010)	(0.033)	(0.056)	(0.282)	(0.029)
Bid-to-cover (surp.)	0.010**	0.057***	0.106***	0.185	0.113***
	(0.004)	(0.015)	(0.024)	(0.141)	(0.031)
Yield gap (exp.)	0.171	0.261**	-1.410	29.381	-0.341
	(0.107)	(0.457)	(2.320)	(20.819)	(0.600)
Yield gap (surp.)	-0.096***	-0.224	-0.605***	-3.346**	-1.387***
	(0.033)	(0.104)	(0.226)	(1.370)	(0.248)
Observations	168	138	163	48	524
R^2	0.127	0.176	0.252	0.230	0.092

Note: Panel (A) shows the estimated coefficient of the regression of the bid-to-cover ratio (total bids over targeted volume) and the yield gap (yield at the action minus the secondary market yield the previous day) series on the high frequency demand shocks. Panel (B) shows the estimated coefficient when the expected and the surprise component of the bid-to-cover and the yield gap series enter separately. The expected component is defined as the fitted values, while the surprise is the residual series from an AR(4) model. All regressions include two lagged values of the total ratio, omitted from the tables. Column (1) restricts the sample to include only auctions of 2-year bonds, Column (2) restricts the sample to include only auctions of 5-year bonds, Column (3) restricts the sample to include only auctions of 10-year bonds, Column (4) restricts the sample to include only auctions of 30-year bonds. Column (5) pools auction with all maturities. Standard errors in parentheses. (*), (**) and (***) denote statistical significance at 10, 5 and 1% respectively.

Table A3: Auction results and high-frequency surprises: Italy

Panel (A): Total bid-to-cover ratio and yield gap				
	(1)	(2)	(3)	(4)
	$D_t^{(2Y)}$	$D_t^{(5Y)}$	$D_t^{(10Y)}$	D_t
Bid-to-cover	0.023	0.093	0.184*	0.022
	(0.024)	(0.126)	(0.093)	(0.036)
Yield gap	0.085*	-0.390*	-0.079	-0.018*
	(0.045)	(0.199)	(0.065)	(0.010)
Observations	80	20	102	247
R^2	0.148	0.309	0.104	0.025
Panel (B): Expected and surprise components				
	(1)	(2)	(3)	(4)
	$D_t^{(2Y)}$	$D_t^{(5Y)}$	$D_t^{(10Y)}$	D_t
Bid-to-cover (exp.)	-0.013	0.046	0.243	0.011
	(0.063)	(0.321)	(0.228)	(0.050)
Bid-to-cover (surp.)	0.026	0.155	0.160	0.034
	(0.026)	(0.151)	(0.106)	(0.043)
Yield gap (exp.)	-0.238	-1.344	-1.453	-0.106**
	(0.428)	(0.933)	(1.085)	(0.043)
Yield gap (surp.)	0.088*	-0.379*	-0.073	-0.046
	(0.046)	(0.200)	(0.066)	(0.053)
Observations	80	20	102	247
R^2	0.155	0.405	0.121	0.042

Note: See Table [A2](#).

Table A4: Spillover effects into the US Treasury market

	German shock	Italian shock
2 year	-0.507*** (0.153)	0.052 (0.085)
5 year	-1.117*** (0.472)	-0.011 (0.329)
10 year	-1.118*** (0.461)	-0.128 (0.332)
30 year	-0.984*** (0.326)	-0.125 (0.300)

Note: See Table 2

Table A5: Reaction of Treasury yields and CDS spreads - German sub-sample

Panel (A): Full sample					
	DE	IT	FR	ES	NL
2 year	-0.941*** (0.194)	-0.549* (0.382)	-0.921*** (0.190)	-0.289 (0.449)	-0.964*** (0.155)
5 year	-1.596*** (0.145)	-0.616* (0.385)	-1.388*** (0.167)	-0.354 (0.457)	-1.445*** (0.146)
10 year	-1.780*** (0.177)	-0.596** (0.322)	-1.508*** (0.176)	-0.392 (0.374)	-1.594*** (0.163)
30 year	-1.968*** (0.179)	-0.569** (0.273)	-1.655*** (0.184)	-0.541* (0.337)	-1.877*** (0.167)
2-year CDS	0.211* (0.129)	1.313*** (0.497)	0.353*** (0.135)	1.933*** (0.487)	0.211** (0.096)
10-year CDS	0.207* (0.238)	1.175*** (0.463)	0.386** (0.202)	1.798*** (0.468)	0.202** (0.114)
Panel (B): Sub-sample					
	DE	IT	FR	ES	NL
2 year	-0.787*** (0.144)	-0.188 (0.556)	-0.648*** (0.190)	0.300 (0.614)	-0.782*** (0.149)
5 year	-1.583*** (0.166)	-0.213 (0.578)	-1.274*** (0.210)	0.282 (0.644)	-1.380*** (0.160)
10 year	-1.994*** (0.175)	-0.239 (0.466)	-1.598*** (0.203)	0.111 (0.518)	-1.667*** (0.168)
30 year	-2.144*** (0.185)	-0.099 (0.371)	-1.723*** (0.216)	0.064 (0.438)	-2.008*** (0.177)
2-year CDS	0.085* (0.062)	1.426*** (0.570)	0.348** (0.150)	1.946*** (0.559)	0.132* (0.082)
10-year CDS	0.095 (0.092)	1.266*** (0.534)	0.394** (0.232)	1.794*** (0.538)	1.267 (0.109)

Note: Estimated δ coefficients from $\Delta Y_t = \mu + \delta D_t + \varsigma_t$. D_t is the first principal component of the shock measures, normalized to zero mean and unit variance. Panel (A) shows the estimates for the full sample (1999-2017), Panel (B) displays the estimates after restricting the sample to match the Italian sample (2009-2017). Newey-West standard errors in parenthesis. (*), (**) and (***) denote statistical significance at 10, 5 and 1% respectively. The columns correspond to German (DE), Italian (IT), French (FR), Spanish (ES) and Dutch (NL) assets. The rows correspond to 2-year, 5-year, 10-year and 30-year Treasuries and credit defaults swaps (CDS) written on 2 and 10-year Treasuries.

Table A6: Reaction of equity indices and corporate bond indices - German sub-sample

	Full sample		Sub-sample	
	Equities	Corp. bonds	Equities	Corp. bonds
Germany	-0.260*** (0.090)	-1.129*** (0.185)	-0.131** (0.061)	-1.188*** (0.206)
Italy	-0.300*** (0.082)	-1.177*** (0.187)	-0.267*** (0.081)	-1.176*** (0.416)
France	-0.246*** (0.091)	-1.355*** (0.285)	-0.138*** (0.058)	-1.387*** (0.230)
Spain	-0.291*** (0.092)	-1.091*** (0.320)	-0.198*** (0.082)	-1.195*** (0.442)
Netherlands	-0.257*** (0.104)	-1.106*** (0.285)	-0.124** (0.052)	-1.407*** (0.176)
Euro area	-0.266*** (0.093)	-1.254*** (0.192)	-0.152*** (0.061)	-1.325*** (0.221)

Note: Estimated δ coefficients from $\Delta Y_t = \mu + \delta D_t + \varsigma_t$. The left two columns display the estimates for the full sample (1999-2017), the right two columns display the estimates after restricting the sample to match the Italian sample (2009-2017). D_t is the first principal component of the shock measures, normalized to zero mean and unit variance. Equity indices are the DAX, FTSEMIB, CAC40, IBEX35, AEX, EUROSTOXX in logarithm. Corporate bond indices are the corporate sub-index of the country level Bloomberg Barclays Euro Aggregate Index. Newey-West standard errors in parenthesis. (*), (**) and (***) denote statistical significance at 10, 5 and 1% respectively.

Table A7: Reaction of Treasury yields and CDS spreads - IV regression

Panel (A): Germany					
	DE	IT	FR	ES	NL
2 year	-1.039*** (0.202)	-0.236 (0.406)	-0.816*** (0.194)	-0.261 (0.470)	-0.970*** (0.156)
5 year	-1.409*** (0.152)	-0.355 (0.398)	-1.159*** (0.174)	-0.291 (0.474)	-1.217*** (0.153)
10 year	-1.412*** (0.196)	-0.357 (0.331)	-1.115*** (0.192)	-0.281 (0.381)	-1.224*** (0.173)
30 year	-1.277*** (0.235)	-0.204 (0.281)	-1.031*** (0.227)	-0.205 (0.344)	-1.172*** (0.221)
2-year CDS	0.174* (0.130)	1.315*** (0.497)	0.146 (0.144)	1.646*** (0.499)	0.169** (0.096)
10-year CDS	0.177 (0.138)	1.309*** (0.462)	0.261 (0.207)	1.481*** (0.482)	0.133 (0.113)
Panel (B): Italy					
	DE	IT	FR	ES	NL
2 year	-0.182 (0.183)	-1.231 (1.221)	-0.194 (0.174)	-0.842 (1.067)	-0.242* (0.177)
5 year	-0.287 (0.239)	-1.357* (0.972)	-0.238 (0.264)	-0.808 (0.834)	-0.361* (0.226)
10 year	-0.361* (0.252)	-1.158** (0.660)	-0.355* (0.259)	-0.775* (0.621)	-0.344* (0.236)
30 year	-0.364* (0.266)	-0.744** (0.452)	-0.363* (0.249)	-0.673* (0.434)	-0.336* (0.245)
2-year CDS	-0.071 (0.145)	-0.070 (0.750)	-0.020 (0.190)	-0.511 (0.551)	-0.019 (0.199)
10-year CDS	0.011 (0.249)	0.055 (0.725)	-0.040 (0.202)	-0.382 (0.454)	-0.025 (0.200)

Note: Estimated δ coefficients from $\Delta Y_t = \mu + \delta \hat{D}_t + \varsigma_t$. \hat{D}_t is the first principal component of the high-frequency shock measures, instrumented by the surprise component of the bid-to-cover ratio and yield-gap expected and surprise components pooled together at all maturities and normalized to zero mean and unit variance. The surprise component is obtained as the residuals of a univariate AR(4) models. Newey-West standard errors in parenthesis. (*), (**) and (***) denote statistical significance at 10, 5 and 1% respectively. Panel (A) displays the estimates of the German demand shock, Panel (B) displays the estimates of the Italian shock. The columns correspond to German (DE), Italian (IT), French (FR), Spanish (ES) and Dutch (NL) assets. The rows correspond to 2-year, 5-year, 10-year and 30-year Treasuries and credit defaults swaps (CDS) written on 2 and 10-year Treasuries.

Table A8: Reaction of equity indices and corporate bond indices - IV regression

	Germany		Italy	
	Equities	Corp. bonds	Equities	Corp. bonds
Germany	-0.259*** (0.093)	-0.914*** (0.188)	-0.101* (0.074)	-0.067 (0.193)
Italy	-0.262*** (0.086)	-0.854*** (0.298)	-0.059 (0.113)	-0.399 (0.347)
France	-0.231*** (0.094)	-1.038*** (0.198)	-0.082 (0.090)	-0.251 (0.357)
Spain	-0.303*** (0.095)	-0.801*** (0.329)	-0.033 (0.092)	-0.362 (0.503)
Netherlands	-0.255*** (0.108)	-0.931*** (0.294)	-0.053 (0.057)	-0.164 (0.167)
Euro area	-0.252*** (0.096)	-0.903*** (0.202)	-0.080 (0.081)	-0.198 (0.267)

Note: Estimated δ coefficients from $\Delta Y_t = \mu + \delta \hat{D}_t + \varsigma_t$. \hat{D}_t is the first principal component of the high-frequency shock measures, instrumented by the surprise component of the bid-to-cover ratio and yield-gap expected and surprise components pooled together at all maturities and normalized to zero mean and unit variance. The surprise component is obtained as the residuals of a univariate AR(4) models. Newey-West standard errors in parenthesis. (*), (**) and (***) denote statistical significance at 10, 5 and 1% respectively. Equity indices are the DAX, FTSEMIB, CAC40, IBEX35, AEX, EUROSTOXX in logarithm. Corporate bond indices are the corporate sub-index of the country level Bloomberg Barclays Euro Aggregate Index.

Table A9: Reaction of Treasury yields and CDS spreads - control variables

Panel (A): Full sample					
	DE	IT	FR	ES	NL
2 year	-0.930*** (0.188)	-0.373 (0.360)	-0.873*** (0.176)	-0.116 (0.397)	-0.930*** (0.146)
5 year	-1.573*** (0.141)	-0.475* (0.329)	-1.334*** (0.173)	-0.219 (0.398)	-1.405*** (0.398)
10 year	-1.759*** (0.188)	-0.546** (0.299)	-1.476*** (0.193)	-0.323 (0.333)	-1.569*** (0.177)
30 year	-1.921*** (0.196)	-0.518** (0.264)	-1.617*** (0.185)	-0.491* (0.308)	-1.844*** (0.181)
2-year CDS	0.210* (0.130)	1.308*** (0.457)	0.370** (0.172)	2.102*** (0.487)	0.231** (0.102)
10-year CDS	0.179 (0.151)	1.175*** (0.433)	0.406** (0.202)	1.886*** (0.462)	0.220** (0.103)
Panel (B): Sub-sample					
	DE	IT	FR	ES	NL
2 year	0.001 (0.143)	-3.343*** (0.925)	-0.354** (0.211)	-2.954*** (0.734)	-0.166 (0.166)
5 year	-0.245 (0.226)	-3.807*** (0.808)	-0.470** (0.238)	-3.143*** (0.706)	-0.516*** (0.706)
10 year	-0.368* (0.262)	-3.289*** (0.571)	-0.685*** (0.244)	-2.516*** (0.647)	-0.655*** (0.233)
30 year	-0.271 (0.249)	-2.106*** (0.542)	-0.628*** (0.236)	-1.809*** (0.623)	-0.278 (0.237)
2-year CDS	-0.282*** (0.113)	-1.603** (0.757)	-0.081 (0.217)	-1.004* (0.662)	-0.368*** (0.148)
10-year CDS	-0.508*** (0.168)	-1.398** (0.703)	-0.377** (0.180)	-0.902** (0.538)	-0.413*** (0.145)

Note: Estimated δ coefficients from $\Delta Y_t = \mu + \delta D_t + controls + \zeta_t$. D_t is the first principal component of the shock measures, normalized to zero mean and unit variance. Control variables include lagged dependent variable, lagged change in the domestic stock index, lagged change in the euro area stock index, lagged change in the domestic 10-year government bond yield, lagged change in the euro area government bond index, lagged change in the domestic corporate bond index. Newey-West standard errors in parenthesis. (*), (**) and (***) denote statistical significance at 10, 5 and 1% respectively. Panel (A) displays the estimates of the German demand shock, Panel (B) displays the estimates of the Italian shock. The columns correspond to German (DE), Italian (IT), French (FR), Spanish (ES) and Dutch (NL) assets. The rows correspond to 2-year, 5-year, 10-year and 30-year Treasuries and credit defaults swaps (CDS) written on 2 and 10-year Treasuries.

Table A10: Reaction of equity indices and corporate bond indices - control variables

	Germany		Italy	
	Equities	Corp. bonds	Equities	Corp. bonds
Germany	-0.258*** (0.077)	-1.087*** (0.228)	0.039 (0.075)	-0.178 (0.224)
Italy	-0.291*** (0.074)	-1.041*** (0.282)	0.245*** (0.088)	-0.404 (0.337)
France	-0.235*** (0.074)	-1.295*** (0.198)	0.071 (0.082)	-0.171 (0.343)
Spain	-0.286*** (0.073)	-0.947*** (0.303)	0.116* (0.085)	-0.275 (0.464)
Netherlands	-0.247*** (0.083)	-1.079*** (0.257)	0.033 (0.059)	-0.339** (0.180)
Euro area	-0.256*** (0.077)	-1.164*** (0.204)	0.075 (0.079)	-0.226 (0.253)

Note: Estimated δ coefficients from $\Delta Y_t = \mu + \delta D_t + controls + \varsigma_t$. D_t is the first principal component of the shock measures, normalized to zero mean and unit variance. Control variables include lagged dependent variable, lagged change in the domestic stock index, lagged change in the euro area stock index, lagged change in the domestic 10-year government bond yield, lagged change in the euro area government bond index, lagged change in the domestic corporate bond index. Newey-West standard errors in parenthesis. (*), (**) and (***) denote statistical significance at 10, 5 and 1% respectively. The left two columns display the estimates for the full sample (1999-2017), the right two columns display the estimates after restricting the sample to match the Italian sample (2009-2017).

Table A11: Positive and negative shock estimates in high and low financial stress - Germany

	Low stress			High stress			Test(2)	Test(3)
	Negative	Positive	Test(1)	Negative	Positive	Test(1)		
10-year Treasury yields								
German	-2.232*** (0.338)	-1.543*** (0.260)		-1.765*** (0.702)	-1.423*** (0.503)			
Italian	0.949 (0.903)	-0.811** (0.384)	†	-2.369*** (0.827)	-0.284 (0.690)	†	- - -	
French	-1.642*** (0.450)	-1.454*** (0.202)		-1.534** (0.733)	-1.175** (0.511)			
Spanish	0.952 (0.989)	-0.322 (0.377)		-1.759*** (0.663)	0.101 (1.148)		- -	
Dutch	-1.772*** (0.402)	-1.552*** (0.193)		-1.695*** (0.663)	-1.469*** (0.527)			
CDS on 10-year Treasuries								
German	0.426** (0.199)	-0.006 (0.114)	†	-0.123 (0.246)	0.564 (0.538)		-	
Italian	3.242*** (0.968)	0.687* (0.494)	††	-2.729*** (0.952)	1.104 (1.390)	††	- - -	
Equity indices								
German	-0.303*** (0.114)	-0.099 (0.106)		-0.143 (0.193)	-0.964*** (0.261)	††		+++
Italian	-0.437*** (0.114)	-0.143 (0.119)	†	-0.106 (0.193)	-0.797*** (0.215)	††		+++
French	-0.223*** (0.095)	-0.111 (0.108)		-0.094 (0.181)	-0.987*** (0.258)	† † †		+++
Spanish	-0.391*** (0.118)	-0.194* (0.127)		0.015 (0.130)	-0.929*** (0.260)	† † †	- -	++
Dutch	-0.157** (0.095)	-0.122* (0.087)		-0.144 (0.215)	-1.124*** (0.327)	††		+++
Corporate bond indices								
German	-1.380*** (0.435)	-1.083*** (0.197)		-0.900* (0.580)	-0.640 (0.577)			
Italian	-1.293** (0.654)	-1.091*** (0.329)		-1.230 (1.054)	-1.009** (0.567)			
French	-1.579*** (0.323)	-1.157*** (0.215)		-1.067* (0.678)	-1.336** (0.645)			
Spanish	-1.215* (0.871)	-1.045*** (0.229)		-1.380* (0.941)	-0.385 (0.633)			
Dutch	-1.596*** (0.275)	-1.182*** (0.219)		-1.272** (0.623)	0.396 (1.189)			

Note: Estimated δ coefficients from $\Delta Y_t = C_t S_t (\mu^{(H,N)} + \delta^{(H,N)} D_t) + (1 - C_t) S_t (\mu^{(L,N)} + \delta^{(L,N)} D_t) + C_t (1 - S_t) (\mu^{(H,P)} + \delta^{(H,P)} D_t) + (1 - C_t) (1 - S_t) (\mu^{(L,P)} + \delta^{(L,P)} D_t) + \zeta_t$. D_t is the first principal component of the shock measures normalized to zero mean, unit variance. C_t is a high financial stress indicator, S_t is a negative shock indicator. Newey-West standard errors in parenthesis. (*), (**) and (***) denote statistical significance, (†), (††) and (†††) indicate statistically different estimates within high and low stress states, (-), (-) and (-) indicates statistically different estimates of negative shocks between high and low stress regimes, (+), (++) and (+++) indicate statistically different estimates of positive shocks between high and low stress regimes, at the 10, 5 and 1% level.

Table A12: Positive and negative shock estimates in high and low financial stress - Italy

	Low stress			High stress			Test(2)	Test(3)
	Negative	Positive	Test(1)	Negative	Positive	Test(1)		
10-year Treasury yields								
German	0.218 (0.539)	-1.675*** (0.495)	† † †	-0.424 (0.533)	-0.911** (0.392)			
Italian	-1.684** (0.739)	-4.383*** (0.776)	† †	-2.737*** (0.781)	-2.636*** (0.980)			
French	0.237 (0.407)	-1.667*** (0.595)	† † †	-0.495 (0.566)	-1.056** (0.547)			
Spanish	-1.044* (0.679)	-2.850*** (0.868)		-1.707* (1.059)	-2.725*** (1.136)			
Dutch	-1.167 (0.535)	-1.717*** (0.538)	† †	-0.859** (0.509)	-1.503*** (0.324)			
CDS on 10-year Treasuries								
German	0.156 (0.165)	0.009 (0.223)		-0.480* (0.368)	-1.042*** (0.430)			++
Italian	-0.416 (0.563)	0.647 (0.832)		-1.786 (1.465)	-2.594*** (0.850)			+++
Equity indices								
German	0.107 (0.111)	0.070 (0.119)		-0.161 (0.151)	0.270** (0.127)	† †		
Italian	0.063 (0.106)	0.191* (0.135)		0.144 (0.196)	0.644*** (0.174)	† † †		+
French	0.178* (0.120)	0.073 (0.140)		-0.173 (0.174)	0.427*** (0.130)	† † †	-	+
Spanish	0.163** (0.091)	0.062 (0.164)		-0.107 (0.167)	0.517*** (0.180)	† † †		+
Dutch	0.100 (0.081)	0.042 (0.109)		-0.079 (0.152)	0.229*** (0.084)	† †		
Corporate bond indices								
German	-0.210 (0.404)	-0.802*** (0.325)		0.135 (0.403)	-1.114*** (0.411)	† †		
Italian	-1.114*** (0.318)	-0.695* (0.438)		0.528 (0.876)	-1.358** (0.783)		-	
French	-0.486* (0.320)	-0.914*** (0.344)		1.080* (0.768)	-1.378** (0.621)	† †	-	
Spanish	-0.600 (0.484)	-0.234 (0.662)		0.440 (1.645)	-1.193 (0.989)			
Dutch	-0.450 (0.397)	-0.805*** (0.298)		-0.145 (0.412)	-1.020*** (0.366)			

Note: See Table [A11](#).