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The cost of firms' debt financing and the global financial crisis

by Daniele Pianeselli and Andrea Zaghini

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THE COST OF FIRMS' DEBT FINANCING
AND THE GLOBAL FINANCIAL CRISIS

by Daniele Pianeselli[*] and Andrea Zaghini[**]

Abstract

We provide an assessment of the determinants of the risk premium paid by non-financial corporations on long-term bonds. By looking at 5,500 issues in the period 2005-2012, we find that the turbulence in the sovereign debt market has been a major driver of corporate risk in recent years. Compared with 2005-07, the three years preceding the global financial crisis, in 2010-12 Italian, Spanish and Portuguese firms paid an additional premium of between 70 and 120 basis points on average due to the negative spillovers from the sovereign debt crisis, while German firms received a discount of 40 basis points.

JEL Classification: G38; G32.

Keywords: corporate bonds, risk-premium, too-big-to-fail, sovereign debt crisis.

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1. Introduction[1]

We study the evolution of the risk premium on debt financing faced by non-financial corporations when issuing log-term bonds. We focus on a market measure of the risk of debt issuance: the asset swap (ASW) spread, which is the difference between the bond yield and a corporate risk-free rate.[2] In particular, to identify the actual cost of market funding, we look at the ASW spread on the day of bond placement. In fact, the secondary market pricing of any debt security is a measure of the soundness and creditworthiness of the issuing institution in that moment, but it does not change the cost borne by firms on already issued bonds. Thus we differentiate from the literature on corporate bonds with respect to two aspects: on the one hand, we do not investigate the timing and the reasons supporting the firms' decision to finance themselves via debt (Cantillo and Wright 2000; Barry et al. 2009), since we look directly at the gross issuance; on the other hand, we depart from the literature analysing credit spread dynamics in the secondary market (Collin-Dufresne et al. 2001; Elton et al. 2001; Driessen 2005), since we focus on the actual funding cost faced on the primary market.

The papers closest to ours are Morgan and Stiroh (2001), Sironi (2003) and Cardillo and Zaghini (2012) which, relying on market spreads on new bonds, analyse the determinants of the risk premium on bank debt. In particular, Cardillo and Zaghini (2012) find that both implicit and explicit guarantees by the sovereign have a substantial role in

[2] The ASW spread is the spread over the LIBOR (EURIBOR) which is paid on the floating leg of an asset swap contract in order to make the present value of the floating leg and fixed leg equal. Since we focus on corporate bonds we prefer to rely on the reference corporate market rate as our benchmark. In addition, instead of using *ad hoc* interpolated yield curves of sovereign securities we relied on a publicly provided measure.

shaping the wholesale cost of bond issuance by banks, with significant differences between AAA-rated and lower-rated countries. While the literature acknowledges the relevance of the link between the sovereign and the domestic banking system and the possibly vicious interactions among them in "bad times" (Gerlach et al. 2010, CGFS 2011, De Grauwe and Ji, 2013), the role of the sovereign with respect to the funding of non-financial firms is almost neglected. In this paper we want to fill this gap by assessing the role of the sovereign – among other variables – in determining the cost of funding by firms.

Our initial sample consists of 6,140 bonds – with maturity longer than 1 year – issued by non-financial corporations in the euro area, the UK and the US over the period 2005-2012. The time span gives us the possibility to examine two different phases of the recent financial turmoil: the turbulent period following the subprime mortgage crisis and the collapse of Lehman Brothers, and the later period of sovereign debt crisis which affected several euro-area economies.

Table 1 shows a common pattern across geographic areas in the development of the issuance activity: the annual amount of new debt, after a weak 2005, more than doubled between 2006 and 2012. The placement volume shows a steady upward path with two peaks in 2009 and 2012. All in all, we have 4,324 bonds placed by companies headquartered in the US, 1,401 in the euro area and 415 in the UK. About two thirds of the overall euro-area issuance are due to French and German firms with 529 and 368 bonds, respectively.[3] At the firm level, the average issuance of bonds is rather similar across countries, ranging from 4.0 bonds in the UK, to 4.4 in the euro area and 5.1 in the US.

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[3] Nationality and industry group are those of the parent company. Data related to euro area are available for 13 countries (Austria, Belgium, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal and Spain).

Table 1: Issuance characteristics by country and size

Euro Area	Number of issues				Number of issuers				Volume				ASW				Stat		
Size	TOT	S	M	L	TOT	S	M	L	TOT	S	M	L	TOT	S	M	L	T1	T2	Med
2005	6	2	2	2	6	2	2	2	2.5	0.2	0.3	2.0	91	225	44	3	12.3	29.0	24.6
2006	113	19	37	57	47	15	16	16	49.9	7.1	17.0	25.8	37	117	36	12	6.9	27.9	19.2
2007	93	16	41	36	45	14	15	16	53.1	6.0	17.2	29.9	42	99	23	39	11.6	35.2	22.5
2008	142	51	28	63	49	17	14	18	73.5	21.6	14.7	37.2	138	112	162	148	18.2	30.2	26.5
2009	284	57	89	138	114	38	39	37	201.0	28.8	61.0	111.2	247	285	213	253	9.4	24.9	17.7
2010	228	46	67	115	113	39	36	38	112.6	15.1	30.1	67.4	207	333	211	155	4.2	22.6	10.2
2011	201	35	63	103	100	32	34	34	93.1	10.3	26.5	56.2	208	333	225	155	4.0	25.7	10.1
2012	334	63	84	187	144	47	48	49	150.6	17.5	34.5	98.6	229	367	249	174	6.1	26.7	10.2
Total	1401	289	411	701	319	150	106	63	736.2	106.5	201.3	428.5	188	264	183	161	9.1	27.8	17.6

UK	Number of issues				Number of issuers				Volume				ASW				Stat		
Size	TOT	S	M	L	TOT	S	M	L	TOT	S	M	L	TOT	S	M	L	T1	T2	Med
2005	7	2	1	4	5	2	1	2	4.5	0.4	0.8	3.3	22	13	73	14	24.4	46.8	25.9
2006	39	8	9	22	15	5	5	5	20.3	2.2	5.6	12.5	52	68	101	26	5.0	20.6	9.0
2007	35	5	17	13	12	4	4	4	17.7	1.7	9.2	6.7	51	73	56	35	6.4	32.0	16.3
2008	57	9	30	18	20	7	6	7	35.3	4.6	15.5	15.2	177	315	162	132	11.9	28.4	19.7
2009	97	13	36	48	34	11	12	11	43.3	3.5	9.6	30.2	254	356	283	204	3.8	21.4	10.9
2010	46	10	16	20	28	9	10	9	21.0	2.6	7.0	11.3	230	302	245	183	1.7	7.3	4.3
2011	43	14	9	20	22	7	7	8	21.4	6.0	5.0	10.3	236	307	295	159	4.4	26.9	9.5
2012	91	18	25	48	45	15	15	15	50.2	5.2	14.1	30.9	233	425	236	158	3.3	11.9	8.7
Total	415	79	143	193	104	47	35	22	213.5	26.3	66.7	120.5	194	296	206	144	7.6	24.4	13.0

US	Number of issues				Number of issuers				Volume				ASW				Stat		
Size	TOT	S	M	L	TOT	S	M	L	TOT	S	M	L	TOT	S	M	L	T1	T2	Med
2005	81	15	15	51	40	13	13	14	32.9	2.6	3.0	27.2	32	82	88	1	4.8	16.5	6.9
2006	270	44	52	174	113	37	38	38	123.5	10.7	18.1	94.7	85	204	156	34	3.9	15.4	6.3
2007	538	109	138	291	224	77	72	75	222.3	24.4	44.1	153.7	108	215	130	57	3.0	9.9	5.0
2008	510	93	128	289	206	72	66	68	210.6	17.8	35.3	157.4	200	281	216	166	4.1	13.2	8.2
2009	697	120	160	417	292	99	96	97	285.4	27.2	50.9	207.3	304	414	363	250	4.0	13.1	6.7
2010	639	117	164	358	285	96	93	96	238.3	30.3	57.2	150.8	196	328	214	145	3.3	10.7	5.8
2011	711	129	163	419	281	95	95	91	261.9	35.5	61.7	164.7	173	312	189	123	4.6	13.4	7.0
2012	878	160	221	497	400	134	132	134	395.9	46.6	83.8	265.5	213	385	243	145	3.4	10.9	6.1
Total	4324	787	1041	2496	851	387	277	187	1,770.7	195.1	354.2	1,221.4	193	317	224	140	3.9	12.9	6.5

NOTE.– Volume in billion of euro; ASW spread in basis points. For each year, issuers by country are divided into three size groups (Small, Medium, Large) based on total assets: the two threshold values (tertiles) and the median are reported in the last three columns (billion of euro).

Sources: Dealogic and Thomson Reuters Datastream

Bearing in mind these main stylised facts, we focus on two characteristics which significantly influence the ability to tap the bond market: firm size and rating class. As for the former, size affects the ability to issue bonds because of the fixed cost associated to the public placement as searching, monitoring and agency costs (Blackwell and Kidwell 1988).

Large firms with bigger issues can cope better with these costs, since they are able to generate significant economies of scale (Denis and Mihov 2003). In our sample, the share of bonds issued by small firms (first tertile by total assets) ranges from 18.2 to 20.6 per cent, and it is even smaller in volume (from 11 per cent in the US to 12.3 in the UK and 14.5 in euro area).

Table 2: ASW spread by country and issuer rating

Country		2005	2006	2007	2008	2009	2010	2011	2012	Total
Italy	IG	-11	46	41	228	225	159	241	267	194
		1	*4*	*13*	*6*	*26*	*13*	*13*	*22*	*98*
	HY		205			403	519	403	477	389
			2			*1*	*1*	*3*	*2*	*9*
Germany	IG	40	6	19	153	217	103	156	96	121
		2	*44*	*18*	*38*	*74*	*36*	*33*	*77*	*322*
	HY		161	157		476	510	427	489	455
			1	*2*		*3*	*12*	*13*	*15*	*46*
France	IG		30	16	91	219	139	142	165	135
			32	*41*	*71*	*91*	*84*	*81*	*92*	*492*
	HY			221		584	375	364	446	410
				3		*4*	*9*	*7*	*14*	*37*
Spain	IG	26	38	35	171	173	96	214	290	165
		1	*6*	*4*	*4*	*15*	*10*	*9*	*16*	*65*
	HY		321			634	688	537	489	590
			1			*1*	*6*	*3*	*2*	*13*
Greece-Ireland-Portugal	IG		64		345	234	184	224	546	294
			3		*4*	*8*	*4*	*5*	*7*	*31*
	HY					504	596	655	621	601
						3	*6*	*2*	*11*	*22*
Euro Area	IG	91	23	31	133	230	138	158	173	150
		6	*107*	*87*	*140*	*270*	*185*	*167*	*275*	*1,237*
	HY		289	206	467	582	495	442	488	470
			6	*6*	*2*	*14*	*44*	*35*	*57*	*164*
United Kingdom	IG	22	52	51	177	224	179	174	177	161
		7	*39*	*35*	*57*	*89*	*40*	*39*	*78*	*384*
	HY					591	570	833	564	607
						8	*6*	*4*	*13*	*31*
United States	IG	21	34	67	183	251	132	126	130	141
		77	*222*	*446*	*477*	*602*	*516*	*607*	*680*	*3,627*
	HY	232	321	303	439	638	464	443	502	462
		4	*48*	*92*	*33*	*95*	*123*	*104*	*198*	*697*

NOTE.– ASW spread in basis points, number of placements in italics.

Sources: Dealogic and Thomson Reuters Datastream

Regardless of the geographic location, the ASW spread firms pay at issuance is significantly higher for smaller issuers. Companies from the first tertile often pay a premium

between two and three times that of firms from the third tertile. In addition, the financial crisis seems to have hit firms of the same size differently across geographic area. During the first phase of the financial turmoil (2007-2008), the ASW spread increases more for large than small companies in the US and euro area, while it is the other way around for the UK. However, from 2009 the difference in the ASW spread paid by small and large firms significantly increases (to reach the maximum in 2012) in each of the three economies (194 bp in euro area, 240 bp in the US and 267 bp in the UK).

By distinguishing between *"Investment Grade"* and *"High Yield"* (henceforth IG and HY), Table 2 reports the pattern of the issuance premium by rating classes. In the period considered, the risk premium increases in all areas and for both rating classes. In the euro area, in 2006, the average ASW spread for IG issues is 6 bp in Germany and 46 bp, 38 bp and 64 bp in Italy, Spain and the GIP group (Greece, Ireland and Portugal), respectively. However, the IG placement in the UK and the US pays an ASW spread (34 bp and 52 bp, respectively) somewhat higher than the euro area average (23 bp). In the same year, risk premia for HY issues are considerably higher: they range from 161 bp in Germany to 321 bp in Spain and the US.

As for the financial crisis period, in the US and the UK, the ASW spread substantially increases for IG issues in the early phase of the distress in the subprime mortgage market (2007 and 2008), and after a peak in 2009, it levels off at a lower level. The pattern is similar for HY placements by firms in the US, while it is more erratic in the UK given the reduced issuance of HY bonds. In the euro area there are sizeable differences across countries: Germany exhibits a development relatively similar to that of US and UK bonds with IG rating, but not to that of HY placements. In particular, while for German IG bonds the average ASW spread reaches 217 bp in 2009 to decline to 96 bp in 2012, for HY

issues the spread fluctuates around the 2009 levels also in the following years, thus not showing signs of a recovery.

An even clearer effect of the sovereign bond crisis can be detected in Italy, Spain and GIP countries. The ASW spread for IG placements significantly increases for Italian firms during the first phase of the financial crisis. The risk premium considerably widens compared to Germany, France and Spain in 2008, when the spread reaches 228 basis points. After a very difficult 2009, in 2010 the financing conditions on bond markets tend to improve and head back towards pre-crisis times, at least as credit spreads are concerned: Italy moves in accordance with all the other countries, even though only the issuances from GIP countries pays a higher ASW spread. However, in 2011 and 2012, when the government bond crisis after Ireland and Portugal hits also Italy and Spain, a decoupling from France and Germany becomes evident. While in Italy and Spain the ASW spread increases significantly to reach the maximum in 2012, it decreases in Germany and it increases only slightly in France. Italian and Spanish IG issues pays in 2012 around 170 bp and 200 bp, respectively, more than German bonds within the same rating class. Instead, the cost of the HY issuance behaves in a similar way in the four countries; in 2012 the average ASW spread ranges from 446 bp in France to 489 bp in Spain and Germany.

2. Econometric evidence

In order to empirically assess the determinants of the premium on corporate bonds we propose a panel regression of the ASW spread paid at issue by firms over the 8 years from 2005 to 2012. From the complete set of bonds for which the ASW spread is available, our analysis is restricted to around 5,500 issues for which we have the complete list of bonds' characteristics. They are issued by 1,100 firms headquartered in 15 countries (13 euro-area countries, the UK and the US). The value of the premium paid on bonds is determined by

several factors, including the characteristics of the issuer (such as size and industry group), those of the bond (such as issuance volume and maturity), and of course the market sentiment. It can also reflect the creditworthiness of the sovereign: in fact, as it is the case for banks, the sovereign rating is almost everywhere perceived by market participants as a cap for the risk assessment of issuing institutions.

Our empirical investigation tries to disentangle the contribution of each characteristic of the four groups. We thus run the following regression by means of pooled OLS with time dummies to take into account the market dynamics:

$$spread_i = \alpha_0 + \sum \alpha_j V_{i,j}^{issuer} + \sum \alpha_k V_{i,k}^{bond} + \sum \alpha_l V_{i,l}^{country} + \sum \alpha_z D_z^{time} + \varepsilon;$$

where spread is the ASW spread at issue of each bond, V_j^{issuer} are the variables characterizing the issuer (size, leverage, industry, rating), V_k^{bond} are the variables of the bond features (volume, maturity, currency, rating), $V_l^{country}$ are the variables associated with the country of residence of the parent issuer (rating, CDS spread, geographic area), D_z^{time} are (yearly) time dummies which take into account the market conditions at the time of issuance. In the regressions all exogenous variables are taken at time t (the exact issuance day) with the exception of balance sheet data which refer to the end of the previous year (i.e., they area taken from the last available annual balance sheet).[4]

Table 3 reports the summary statistics of the main variables employed in the regression procedure, excluding dummy variables.

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[4] Our analysis focuses on the determinants of the price of issued bonds, but do not take into account other possible channels through which the crisis might have influenced the funding ability of a given firm. For instance when the creditworthiness of an issuer deteriorates it might decide to diminish the amount to be issued or issue bonds of a shorter maturity. In addition, it might opt to postpone the issuance or even to find a different channel of funding.

Table 3. Summary statistics

	Observations	Mean	Median	Std. Dev.	Max	Min
ASW spread	5,427	185	140	174	1,072	-155
Leverage	5,427	54	51	31	99	0.1
Total asset	5,427	91	24	180	544	2.8
Duration	5,427	3,745	2,931	3,365	36,680	365
Volume	5,427	448	351	389	3,720	0.6
Firm Rating	5,427	12	12	3.6	20	2.0
Bond Rating	5,427	13	13	3.6	20	2.0
Sovereign Rating	5,427	20	20	1.1	25	1.0
Sovereign CDS	5,427	70	42	770	3,703	1.3
Issuer CDS	5,050	103	57	147	3,120	3.8
Employees	1,994	90,947	49,861	179,136	2,100,000	22

ASW spread is the difference between the bond yield and the fixed-leg rate of a swap contract with the same maturity (basis points). Leverage is the ratio between debt and debt+equity multiplied by 100. Total asset is the firm balance sheet value of all assets (billion of euros). Duration is the bond maturity at issuance (days). Volume is the face value of the bond (million of euro). Firm Rating, Bond Rating and Sovereign Rating are the average of the ratings provided by Moody's, Fitch and Strandard&Poors linearised between 0 (C-) and 25 (AAA). Issuer CDS and Sovereign CDS are the average of the daily credit default swap for 5-year contracts computed in the 15-day period before the bond issuance (basis points). Employees is the number of employees working for the non-financial corporation.

We start with a basic specification and then we add some variables at each estimation round; we report only the estimates for which the explanatory variables turned out to be significantly different from zero. The first column of Table 4 shows that the standard characteristics of the issue have the expected sign: the longer the duration and the larger the volume, the higher the cost at issue. Also the currency denomination in euro seems to abate the ASW spread paid by firms (negative coefficient). Note that the positive sign of the issuance size may reflect the fact that the market negatively assesses the increased debt burden, or simply that, in order to place a larger issue, firms are required to pay a higher spread (Shi 2003). In addition, the estimated coefficient of the bond rating has the expected negative sign (a better rating leads to a smaller risk-premium).[5]

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[5] The standard errors reported in Table 4 and 5 are the robust standard errors proposed by White (1980). We also compute clustered standard errors at the country and sector level, which confirm the significance of the coefficients.

In order to take into account the possible non-linearities in the relationship between the premium on bond and the firm dimension highlighted in the previous section, in the panel regression we introduce the variable size (expressed as total assets) both in levels and squared. The results confirm the non-linearity hypothesis with a positive coefficient for levels and a negative coefficient for squared values, which suggests a lesser premium required on large firms.[6] As far as other firm-specific characteristics are concerned, the leverage and the firm rating have, as expected, a positive and a negative coefficient, respectively.

The second column of Table 4 shows instead that the implicit guarantee provided by a sound sovereign has a beneficial effect on the ASW spread paid by firms. In fact, the coefficient of the sovereign rating turns out to be negative and the coefficients of both bond rating and issuer rating do not change.[7] This effect is similar to that detected for the banking system (Grande et al. 2011; Lindh and Schich 2012; Cardillo and Zaghini 2012): a high sovereign rating reflects a positive market assessment of the soundness of public finances, which in turn means room of manoeuvre to intervene in the economy with expansionary measures when needed (via direct support to the economy as a whole or targeted industry interventions). In addition, rating agencies are giving raising importance to the growth outlook of scrutinised economies, thus a high sovereign rating hints at a favourable economic framework for domestic firms' activity. The estimated coefficient suggests that an

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[6] However, it turns out that the beneficial effect of the size, i.e. a negative effect on the overall premium (which can be though of as the equivalent of the too-big-to-fail implicit support provided by governments to systemic banks), kicks in only at a very large dimension. In fact, from the estimated coefficients, it can be computed that only firms with a total asset from around 400 billions of euro enjoy a discount on the ASW spread paid at issue.

[7] By interacting the "Sovereign Rating" variable with two time dummies (non-crisis period and crisis period), it turns out that the negative coefficient is significantly higher in absolute terms during the phases of financial distress.

increase in the sovereign rating by one notch reduces the spread paid at issue by domestic

firms by 10 basis points.[8]

Table 4: OLS regressions over the whole sample[1]

Leverage	**0.5742** ***	**0.5657** ***	**0.5627** ***	**0.4384** ***	**0.4464** ***
	0.0840	0.0834	0.0865	0.0756	0.0768
Total Assets	**0.2568** ***	**0.2540** ***	**0.2338** ***	**0.2880** ***	**0.2847** ***
	0.0160	0.0163	0.0183	0.0171	0.0172
Total Assets^2	**-0.0006** ***	**-0.0005** ***	**-0.0005** ***	**-0.0006** ***	**-0.0006** ***
	0.0000	0.0000	0.0000	0.0000	0.0000
Duration	**0.0047** ***	**0.0047** ***	**0.0049** ***	**0.0065** ***	**0.0065** ***
	0.0005	0.0005	0.0005	0.0005	0.0005
Volume	**0.0320** ***	**0.0308** ***	**0.0318** ***	**0.0231** ***	**0.0241** ***
	0.0047	0.004759	0.004896	0.004307	0.004304
Issuance in euros	**-19.822** ***	**-25.550** ***	**-19.170** ***	**-19.344** ***	**-17.085** ***
	4.5230	4.5511	4.5533	4.0554	4.6065
Firm Rating	**-10.091** ***	**-9.8168** ***	**-11.808** ***	**-12.138** ***	**-12.071** ***
	2.0012	2.0025	1.9758	1.8250	1.8222
Bond Rating	**-28.950** ***	**-28.951** ***	**-27.571** ***	**-30.065** ***	**-29.999** ***
	1.9447	1.9433	1.9240	1.7877	1.7866
Sovereign Rating		**-10.483** ***	**-10.805** ***	**-13.157** ***	**-12.587** ***
		1.4751	1.5087	1.4847	1.5152
Consumer Goods			**-28.706** ***	**-30.682** ***	**-31.073** ***
			6.1777	5.4298	5.4287
Utilities			**-14.141** **	**-34.029** **	**-33.436** **
			5.9166	5.2449	5.2313
Industrials			**16.379** ***	**11.524** ***	**11.204** ***
			6.2794	5.5610	5.5732
Oil			**39.124** ***	**20.496** ***	**22.113** ***
			7.2483	6.5584	6.6079
Basic Materials			**-24.136** ***	**-29.359** ***	**-28.495** ***
			6.5993	5.7904	5.7969
Telecommunication			**-25.826** ***	**-38.975** ***	**-38.289** ***
			8.0008	6.9629	6.9960
Financial Crisis				**140.83** ***	
				4.2065	
Sovereign debt crisis				**29.139** ***	
				3.0938	
EA * Financial crisis					**124.82** ***
					6.9979
Non-EA * Financial crisis					**145.11** ***
					4.7097
EA * Debt crisis					**36.242** ***
					5.7970
Non-EA * Debt crisis					**27.469** ***
					3.3082
R-squared	**0.481**	**0.485**	**0.498**	**0.606**	**0.607**

*(1) Dependent variable: ASW spread; included observations: 5,427; White (1980) robust standard errors & covariances; symbols ***, ** and * denotes statistical significance at 1% 5% and 10%, respectively.*

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[8] Cardillo and Zaghini (2012) estimate that the implicit guarantee provided by a triple-A sovereign may add up to a reduction of the premium of about 80 bp. Following their framework over the same time spam, we estimate that the reduction amounts to 21 bp for the non-financial corporations.

When looking at the industry group we detect a precise pattern with firms belonging to *consumer goods*, *utilities*, *basic materials* and *telecommunication* paying a statistically significant smaller premium on bond issuance, while those from *industrials* and *oil* paying a larger premium (Table 4, third column).

In order to take into account the time dynamics of the ASW spread we introduce two time dummies in the regression. Focusing on the first wave of the financial crisis (2008 and 2009), we estimate an increase of 141 bp in the premium paid by non-financial corporations in that period, while the second wave of the crisis – which from the second half of 2010 took the form of a sovereign debt crisis – brings about a relatively smaller increase of around 30 bp in the ASW spread (fourth column).

However, given that the two waves of the crisis are felt differently across geographic areas, we interact the time dummies with two sub-samples: euro-area firms and "UK plus US" (non-EA) firms. The last column of Table 4 shows that the first wave of the crisis, which originated in the summer 2007 in the US subprime mortgage market, hits US and UK firms in 2008 and 2009 in a more painful way than euro-area peers (145 bp and 125 bp, respectively). Whereas, the opposite is true for the second wave of the financial turbulence, which hits primarily euro-area corporations, with an increase in the ASW spread paid at issuance of 36 bp versus 27 bp for non euro area firms.[9]

Given that the sovereign debt crisis is felt differently also within the euro area, we further investigate the issue by focusing on firms from the euro area only, which consists of a set of 1,200 bonds issued by 300 non-financial corporations.

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[9] Both differences are statistically significant according to the standard Wald test.

Table 5: OLS regressions for the euro area[1]

	(1)	(2)	(3)	(4)	(5)
Leverage	0.5527 ***	0.4787 ***	0.4786 ***	0.4959 ***	0.4507 ***
	0.1356	0.1334	0.1402	0.1416	0.1402
Total Asset	-0.1246 *	-0.1728 **	-0.0738 *	-0.0320	-0.0783 *
	0.0675	0.0554	0.0420	0.0465	0.0448
Duration	0.0073 ***	0.0074 ***	0.0064 ***	0.0063 ***	0.0073 ***
	0.0013	0.0013	0.0013	0.0013	0.0014
Volume	0.0562 ***	0.0508 ***	0.0494 ***	0.0531 ***	0.0374 ***
	0.0089	0.0089	0.0086	0.0089	0.0085
Issuance in euros	-26.800 ***	-25.099 ***	-15.906 **	-12.939 *	-18.965 **
	8.3594	8.1367	7.8036	7.8102	7.7046
Firm Rating	-22.668 ***	-21.563 ***	-18.478 ***	-17.432 ***	-16.715 **
	6.0944	6.0616	6.1126	6.2561	6.5566
Bond Rating	-18.929 ***	-18.067 ***	-27.238 ***	-27.932 ***	-30.078 ***
	6.0402	5.9990	6.3501	6.4285	6.5850
Sovereign Rating		-11.872 ***	-10.831 ***	-11.941 ***	-5.5021 **
		1.4279	1.4765	2.1019	2.8956
Oil			84.011 ***	77.813 ***	92.200 ***
			18.8065	18.9229	15.0365
Basic Materials			57.512 ***	56.629 ***	56.549 ***
			18.9416	18.7868	16.8399
Consumer G&S			-27.372 ***	-29.751 ***	-16.845 *
			11.2387	11.2590	9.1608
T&T			-19.610 *	-21.613 *	-19.816 **
			12.2547	12.2773	9.7494
Germany				-22.713 ***	
				8.5711	
Italy				-40.301 **	
				18.0638	
Spain				-2.0770	
				19.6864	
Portugal				15.709	
				31.4365	
Ireland				-11.004	
				32.1462	
GER*Financial Crisis					72.959 ***
					12.4322
ITA*Financial Crisis					54.521 **
					25.3089
SPA*Financial Crisis					45.590 **
					22.6261
POR*Financial Crisis					71.093 *
					49.8823
IRE*Financial Crisis					179.07 ***
					13.3718
GER*Debt Crisis					-41.754 ***
					10.3408
ITA*Debt Crisis					66.705 ***
					25.5322
SPA*Debt Crisis					87.169 ***
					25.9905
POR*Debt Crisis					119.07 ***
					39.9507
IRE*Debt Crisis					17.053
					46.7349
R-squared	0.471	0.497	0.532	0.538	0.563

(1) Dependent variable: ASW spread; included observations: 1126; White (1980) robust standard errors & covariances; symbols ***, ** and * denotes statistical significance at 1% 5% and 10%, respectively.

The first column of Table 5 shows that the basic characteristics and even the magnitude of the coefficients are maintained also in the restricted euro-area sample, with the

only exception of size: total assets in levels has the expected negative sign – even though the statistical significance is weaker – and non-linearities do not appear any more. At the same time, it is confirmed that a sound creditworthiness of the sovereign reduces the premium at issue (second column). Finally, when looking at the industry breakdown, we have that firms from *Telecommunication & Technology* and *Consumer Goods & Services* pay a smaller premium, whereas those from *Oil* and *Basic material* pay a higher ASW spread (third column).[10]

In order to control for cross-country differences within the euro area, we introduce a dummy variable for each country involved in the sovereign debt crisis and Germany (fourth column). The country coefficients show that, ceteris paribus, German firms get a 23 bp smaller premium at issuance. Also Italian firms show a discount on their bond placement (40 bp), most likely due to the fact that only major Italian corporations (ENEL, ENI and FIAT) tap regularly the bond market. At the same time, the coefficient is not statistically significant for Spain, Portugal and Ireland.

When considering the crisis period specifically divided into the first and second wave of turmoil, we find that in the period 2008-2009 all firms in the sample, regardless of the nationality, face an increase in the ASW spread paid when issuing medium- to long-term bonds, ranging from the 46 bp of Spanish firms to the 179 bp of Irish firms. The striking difference concerns the sovereign debt crisis period which involves mainly Southern European countries: firms headquartered in Italy, Spain and Portugal witness an increase in

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[10] Firms operating in the basic materials industry pay an additional premium with respect to other firms in the euro area, while it is the contrary in the US. This might be due to: 1) the different overall specialization pattern in the two economies; 2) the fact that there are less raw materials in Europe than US.

the premium paid of 67, 87 and 119 basis points, respectively. At the same time German firms are able to get a reduction in the ASW spread of 42 bp.

The negative spillover from the sovereign debt market to the private sector, which characterises the issuance of bank bonds,[11] seems to affect also non-financial firms adding a second channel of influence from the sovereign to the corporate sector. In fact, in addition to the circumstance that a poor sovereign creditworthiness increases the ASW spread paid by domestic firms with respect to non-financial corporations headquartered in sounder countries (the direct effect of the sovereign rating found over the whole sample), the sovereign debt crisis adds a burden only on firms from the weakest states, widening the gap with firms from higher rated states. The case of German firms is striking: during the first wave of the financial crisis, when the sovereign debt market is not yet affected, they face a significant increase in the premium paid at issuance – in line with firms from Italy, Spain and Portugal – however, when the market overhaul of the sovereign risk assessment takes place, German firms are able to get a sizable reduction in the premium paid.

3. Conclusion

The paper provides a broad overview of the recent trend in the medium to long-term funding cost faced by non-financial firms in the US, the UK and the euro area. In particular, we study the dynamics of the premium paid at issuance by non-financial corporations and analyse the contribution of several factors to the cost incurred by firm when issuing bonds. We focus on the asset swap spread at issuance which is a measure of the actual cost faced by firms on each bond net of the risk-free component (which can not be diversified away).

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[11] For a thorough analysis of the different channels through which sovereign risk affects bank funding conditions and viceversa see CGFS (2011) and Gerlach et al. (2010).

Indeed, the ASW spread reflects the market assessment of the firm risk at the moment of the bond placement and represents the idiosyncratic additional cost for the firm.

In order to disentangle the factors affecting the cost at issue, we propose an empirical investigation based on around 5,500 bonds issued between January 2005 and December 2012. The time span allows us to analyse the two phases of the global financial crisis: the early financial crisis which followed the collapse of the subprime mortgage market and the demise of Lehman Brothers, and the later euro-area sovereign debt crisis. As for the latter, starting from mid 2010, concerns about the sustainability of public finances in several euro-area countries and the possibility of the break-up of the euro (the so called reversibility risk) lead to a sharp deterioration of the perceived sovereign creditworthiness. In parallel with the worsening of funding conditions of the domestic country and the related sovereign downgrades by the rating agencies, many non-financial corporations suffer the same fate with increasing CDS spreads and widespread downgrades by several notches.

The econometric evidence shows that the soundness of public finances (proxied by the sovereign rating) plays a substantial role in shaping the cost of bond issuance, in particular in the euro area. We find that the backing of a sound sovereign provides an important implicit support to the domestic private issuer, while weaker governments add a burden on the funding cost of domestic firms. In fact, during the sovereign debt crisis firms headquartered in Italy, Spain and Portugal pay between 66 and 119 basis points of extra premium due to the negative spillover from the sovereign debt market turbulence. On the contrary, while German firms face a significant increase in the premium paid at issuance in the early phase of the financial crisis – in line with firms from Italy, Spain and Portugal – they get a sizable reduction in the ASW premium (42 basis points) during the sovereign debt crisis. Thus, our

findings suggest that the vicious linkage between the sovereign and banking system acknowledged by the literature extends also to non-financial corporations.

References

Barry C.B., S.C Mann, V. Mihov and M. Rodriguez (2009), "Interest rate changes and the timing of debt issues", *Journal of Banking and Finance*, Vol.33, No.4, pp.600-608.

Blackwell D. and D. Kidwell (1988), "An investigation of cost differences between public sales and private placements of debt", *Journal of Financial Economics*, Vol. 22, pp.253–278.

Cantillo M and J. Wright (2000), "How do firms choose their lenders? An empirical investigation", *Review of Financial Studies*, Vol.13, No.1, pp.155-189.

Cardillo A. and A. Zaghini (2012), "The recent trends in long-term bank funding", Bank of Italy Occasional Paper No.137.

Collin-Dufresne P., R.S. Goldstein and J. Spencer Martin (2001), "The Determinants of Credit Spread Changes ", *Journal of Finance* , Vol. 56, No. 6, pp.2177-2207.

CGFS, Committee on the Global Financial System (2011), "The impact of sovereign credit risk on bank funding conditions", CGFS Papers, No. 43.

De Grauwe P. and Ji Y.(2013), "Self-fulfilling crises in the Eurozone: An empirical test", *Journal of International Money and Finance*, Vol.34, pp.15-36.

Denis D.J. and V.T. Mihov (2003), "The choice among bank debt, non-bank private debt, and public debt: evidence from new corporate borrowings", *Journal of Financial Economics*, Vol. 70, No. 1, pp. 3–28.

Driessen J. (2005), "Is Default Event Risk Priced in Corporate Bonds?", *Review of Financial Studies*, Vol.18, No.1, pp.165-195.

Elton E.J., M.J. Gruber, D. Agrawal and C. Mann (2001), "Explaining the Rate Spread on Corporate Bonds", *Journal of Finance* , Vol.56, No.1, pp.247-277.

Gerlach, S, Schulz A. and Wolff G. (2010), "Banking and sovereign risk in the euro area" CEPR DP No. 7833.

Grande G., Levy A., Panetta F. and Zaghini A. (2011), "Public guarantees on bank bonds: effectiveness and distortions", *OECD Journal: Financial Market Trends*, Vol. 2011, No. 2.

Lindh S. and Schich S. (2012), "Implicit guarantees for Bank Debt: Where Do We Stand?", *OECD Journal: Financial Market Trends*, Vol. 2012, No.1.

Morgan D.P. and K.J. Stiroh (2001), "Market discipline of banks: the asset test", *Journal of Financial Services Research*, Vol.20 No.2-3, pp.195-208.

Shi, C. (2003), "On the trade-off between the future benefits and riskiness of R&D: a bondholders' perspective", *Journal of Accounting and Economics*, Vol.35, pp.227-254.

Sironi, A. (2003), "Testing for market discipline in the European banking industry: evidence from subordinated debt issues", *Journal of Money, Credit and Banking*, Vol.35, pp.443-472.

White, H. (1980), "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity", *Econometrica*, Vol.48, No.4, pp.817–838.

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V. CUCINIELLO, *The welfare effect of foreign monetary conservatism with non-atomistic wage setters*, Journal of Money, Credit and Banking, v. 43, 8, pp. 1719-1734, **TD No. 810 (June 2011).**

A. CALZA and A. ZAGHINI, *welfare costs of inflation and the circulation of US currency abroad,* The B.E. Journal of Macroeconomics, v. 11, 1, Art. 12, **TD No. 812 (June 2011).**

I. FAIELLA, *La spesa energetica delle famiglie italiane*, Energia, v. 32, 4, pp. 40-46, **TD No. 822 (September 2011).**

R. DE BONIS and A. SILVESTRINI, *The effects of financial and real wealth on consumption: new evidence from OECD countries,* Applied Financial Economics, v. 21, 5, pp. 409–425, **TD No. 837 (November 2011).**

F. CAPRIOLI, P. RIZZA and P. TOMMASINO, *Optimal fiscal policy when agents fear government default*, Revue Economique, v. 62, 6, pp. 1031-1043, **TD No. 859 (March 2012).**

2012

F. CINGANO and A. ROSOLIA, *People I know: job search and social networks*, Journal of Labor Economics, v. 30, 2, pp. 291-332, **TD No. 600 (September 2006).**

G. GOBBI and R. ZIZZA, *Does the underground economy hold back financial deepening? Evidence from the italian credit market*, Economia Marche, Review of Regional Studies, v. 31, 1, pp. 1-29, **TD No. 646 (November 2006).**

S. MOCETTI, *Educational choices and the selection process before and after compulsory school*, Education Economics, v. 20, 2, pp. 189-209, **TD No. 691 (September 2008).**

P. PINOTTI, M. BIANCHI and P. BUONANNO, *Do immigrants cause crime?*, Journal of the European Economic Association , v. 10, 6, pp. 1318–1347, **TD No. 698 (December 2008).**

M. PERICOLI and M. TABOGA, *Bond risk premia, macroeconomic fundamentals and the exchange rate*, International Review of Economics and Finance, v. 22, 1, pp. 42-65, **TD No. 699 (January 2009).**

F. LIPPI and A. NOBILI, *Oil and the macroeconomy: a quantitative structural analysis,* Journal of European Economic Association, v. 10, 5, pp. 1059-1083, **TD No. 704 (March 2009).**

G. ASCARI and T. ROPELE, *Disinflation in a DSGE perspective: sacrifice ratio or welfare gain ratio?,* Journal of Economic Dynamics and Control, v. 36, 2, pp. 169-182, **TD No. 736 (January 2010).**

S. FEDERICO, *Headquarter intensity and the choice between outsourcing versus integration at home or abroad*, Industrial and Corporate Chang, v. 21, 6, pp. 1337-1358, **TD No. 742 (February 2010).**

I. BUONO and G. LALANNE, *The effect of the Uruguay Round on the intensive and extensive margins of trade,* Journal of International Economics, v. 86, 2, pp. 269-283, **TD No. 743 (February 2010).**

S. GOMES, P. JACQUINOT and M. PISANI, *The EAGLE. A model for policy analysis of macroeconomic interdependence in the euro area,* Economic Modelling, v. 29, 5, pp. 1686-1714, **TD No. 770 (July 2010).**

A. ACCETTURO and G. DE BLASIO, *Policies for local development: an evaluation of Italy's "Patti Territoriali",* Regional Science and Urban Economics, v. 42, 1-2, pp. 15-26, **TD No. 789 (January 2006).**

F. BUSETTI and S. DI SANZO, *Bootstrap LR tests of stationarity, common trends and cointegration,* Journal of Statistical Computation and Simulation, v. 82, 9, pp. 1343-1355, **TD No. 799 (March 2006).**

S. NERI and T. ROPELE, *Imperfect information, real-time data and monetary policy in the Euro area,* The Economic Journal, v. 122, 561, pp. 651-674, **TD No. 802 (March 2011).**

G. CAPPELLETTI, G. GUAZZAROTTI and P. TOMMASINO, *What determines annuity demand at retirement?,* The Geneva Papers on Risk and Insurance – Issues and Practice, pp. 1-26, **TD No. 805 (April 2011).**

A. ANZUINI and F. FORNARI, *Macroeconomic determinants of carry trade activity,* Review of International Economics, v. 20, 3, pp. 468-488, **TD No. 817 (September 2011).**

M. AFFINITO, *Do interbank customer relationships exist? And how did they function in the crisis? Learning from Italy*, Journal of Banking and Finance, v. 36, 12, pp. 3163-3184, **TD No. 826 (October 2011).**

R. CRISTADORO and D. MARCONI, *Household savings in China,* Journal of Chinese Economic and Business Studies, v. 10, 3, pp. 275-299, **TD No. 838 (November 2011).**

P. GUERRIERI and F. VERGARA CAFFARELLI, *Trade Openness and International Fragmentation of Production in the European Union: The New Divide?,* Review of International Economics, v. 20, 3, pp. 535-551, **TD No. 855 (February 2012).**

V. DI GIACINTO, G. MICUCCI and P. MONTANARO, *Network effects of public transposrt infrastructure: evidence on Italian regions,* Papers in Regional Science, v. 91, 3, pp. 515-541, **TD No. 869 (July 2012).**

A. FILIPPIN and M. PACCAGNELLA, *Family background, self-confidence and economic outcomes,* Economics of Education Review, v. 31, 5, pp. 824-834, **TD No. 875 (July 2012).**

2013

F. CINGANO and P. PINOTTI, *Politicians at work. The private returns and social costs of political connections*, Journal of the European Economic Association, v. 11, 2, pp. 433-465, **TD No. 709 (May 2009).**

F. BUSETTI and J. MARCUCCI, *Comparing forecast accuracy: a Monte Carlo investigation*, International Journal of Forecasting, v. 29, 1, pp. 13-27, **TD No. 723 (September 2009).**

D. DOTTORI, S. I-LING and F. ESTEVAN, *Reshaping the schooling system: The role of immigration*, Journal of Economic Theory, v. 148, 5, pp. 2124-2149, **TD No. 726 (October 2009).**

A. FINICELLI, P. PAGANO and M. SBRACIA, *Ricardian Selection*, Journal of International Economics, v. 89, 1, pp. 96-109, **TD No. 728 (October 2009).**

L. MONTEFORTE and G. MORETTI, *Real-time forecasts of inflation: the role of financial variables*, Journal of Forecasting, v. 32, 1, pp. 51-61, **TD No. 767 (July 2010).**

E. GAIOTTI, *Credit availablility and investment: lessons from the "Great Recession"*, European Economic Review, v. 59, pp. 212-227, **TD No. 793 (February 2011).**

A. ACCETTURO e L. INFANTE, *Skills or Culture? An analysis of the decision to work by immigrant women in Italy,* IZA Journal of Migration, v. 2, 2, pp. 1-21, **TD No. 815 (July 2011).**

A. DE SOCIO, *Squeezing liquidity in a "lemons market" or asking liquidity "on tap"*, Journal of Banking and Finance, v. 27, 5, pp. 1340-1358, **TD No. 819 (September 2011).**

M. FRANCESE and R. MARZIA, *is there Room for containing healthcare costs? An analysis of regional spending differentials in Italy,* The European Journal of Health Economics (DOI 10.1007/s10198-013-0457-4), **TD No. 828 (October 2011).**

G. BARONE and G. DE BLASIO, *Electoral rules and voter turnout,* International Review of Law and Economics, v. 36, 1, pp. 25-35, **TD No. 833 (November 2011).**

E. GENNARI and G. MESSINA, *How sticky are local expenditures in Italy? Assessing the relevance of the flypaper effect through municipal data,* International Tax and Public Finance (DOI: 10.1007/s10797-013-9269-9), **TD No. 844 (January 2012).**

A. ANZUINI, M. J. LOMBARDI and P. PAGANO, *The impact of monetary policy shocks on commodity prices*, International Journal of Central Banking, v. 9, 3, pp. 119-144, **TD No. 851 (February 2012).**

S. FEDERICO, *Industry dynamics and competition from low-wage countries: evidence on Italy*, Oxford Bulletin of Economics and Statistics (DOI: 10.1111/obes.12023), **TD No. 879 (September 2012).**

FORTHCOMING

A. MERCATANTI, *A likelihood-based analysis for relaxing the exclusion restriction in randomized experiments with imperfect compliance*, Australian and New Zealand Journal of Statistics, **TD No. 683 (August 2008).**

M. TABOGA, *The riskiness of corporate bonds*, Journal of Money, Credit and Banking, **TD No. 730 (October 2009).**

F. D'AMURI, *Gli effetti della legge 133/2008 sulle assenze per malattia nel settore pubblico,* Rivista di Politica Economica, **TD No. 787 (January 2011).**

E. COCOZZA and P. PISELLI, *Testing for east-west contagion in the European banking sector during the financial crisis,* in R. Matoušek; D. Stavárek (eds.), Financial Integration in the European Union, Taylor & Francis, **TD No. 790 (February 2011).**

R. BRONZINI and E. IACHINI, *Are incentives for R&D effective? Evidence from a regression discontinuity approach,* American Economic Journal : Economic Policy, **TD No. 791 (February 2011).**

F. NUCCI and M. RIGGI, *Performance pay and changes in U.S. labor market dynamics*, Journal of Economic Dynamics and Control, **TD No. 800 (March 2011).**

O. BLANCHARD and M. RIGGI, *Why are the 2000s so different from the 1970s? A structural interpretation of changes in the macroeconomic effects of oil prices*, Journal of the European Economic Association, **TD No. 835 (November 2011).**

F. D'AMURI and G. PERI, *Immigration, jobs and employment protection: evidence from Europe before and during the Great Recession,* Journal of the European Economic Association, **TD No. 886 (October 2012).**

R. DE BONIS and A. SILVESTRINI, *The Italian financial cycle: 1861-2011,* Cliometrica, **TD No. 936 (October 2013).**