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Multilateral Loans and Interest Rates: Further Evidence on the Seniority Conundrum

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Multilateral Loans and Interest Rates: Further Evidence on the Seniority Conundrum

Abstract

During Europe's sovereign-debt crisis, interest rate spreads have been highly correlated with the share of multilateral loans that were considered senior to private markets. As both variables are potentially endogenous, we follow two different approaches to analyze the direction of causality. First, we use a set of IV regressions where the differences between sovereign ratings serve as instruments. Second, we analyze a new panel-survey dataset on seniority and interest rate expectations. In both approaches, we find evidence for the seniority conundrum – i.e., a positive impact of multilateral loans on interest rate spreads.

JEL-Codes: F340, G120, H810.

Keywords: government bond spreads, creditor seniority, recovery rate, interest rate, sovereign debt.

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1. Introduction

The pattern of interest rates in Europe has been the center of debate on public rescue policies in recent years. De Grauwe and Ji (2013) first pointed out that interest rates are not well explained by macroeconomic fundamentals, a result confirmed by several other researchers (e.g., Aizenman et al., 2013; Beirne and Fratzscher, 2013). This detachment from fundamentals has often been taken as evidence for the existence of multiple equilibria and the short-term nature of liquidity shortages in Europe.

Chamley and Pinto (2011) and Gros (2010) pointed out an alternative explanation:[2] They argue that investors might have been worried about the preferred credit status of public rescue packages. In Steinkamp and Westermann (2014), we illustrated that interest rate spreads of 10-year government bonds vis-à-vis Germany have indeed been highly correlated with the share of multilateral loans in total government debt of the countries in crisis. We have interpreted this share as a proxy for the senior tranche of public debt and documented that the partial correlation is robust to the inclusion of the literature's standard control variables.

The correlation between interest rates and the share of senior-tranche lending, however, can clearly be endogenous. On the one hand, public rescue packages drive private investors into a junior position vis-à-vis official-sector creditors and lower their expected recovery rate. Private markets thus require a higher marginal interest rate after the IMF, the ESM and other senior lenders enter the market.[3] On the other hand, there is a policy motivation behind these rescue packages: They aim to keep interest rates reasonably low and target the interest rate spreads of countries in crisis. The causality can plausibly run both ways.

In this paper, we take two different approaches to disentangle the effects. First, we estimate the magnitude of a possible senior-tranche effect using instrumental variables (IV) regressions. Second, we analyze recently released survey data of the ifo institute. This data is now available with a panel dimension, which allows us to pursue a differences-in-differences identification strategy.

As a first instrument in our IV regressions, we take advantage of heterogeneity in rating-agency decisions that allows us to construct a proxy of expectations about recovery values: While some rating agencies base their decisions on both the probability of default and expected recovery values, others assess the probability of default only. The difference between these ratings – transferred to a numerical scale – is our first instrument for the senior-tranche variable.

Second, we employ recent advancements in the econometrics of IV regressions. We follow the identification approach suggested by Lewbel (2012) to exploit heteroscedasticity in the first-stage

[2] See also Mody (2014).

[3] For theoretical models analyzing the link between marginal interest rates and senior lending, see Corsetti et al. (2006), Bolton and Jeanne (2009), Saravia (2010), as well as Chamley and Pinto (2013). More generally, the link between bond prices and the seniority of lenders is modeled for government bonds in Bartolini and Dixit (1991) and for corporate bonds in Black and Cox (1976).

regression. By imposing higher moment restrictions, this IV technique yields consistent estimates even in the absence of external instruments. A complementary use of these instruments may further increase estimation efficiency.

Last, we also use lagged values as instruments. We consider this as a third approach to tackle the potential endogeneity issue, as lagged values of the senior tranche are unlikely to be determined by contemporaneous interest rate spreads.

In all of our IV regressions, the senior-tranche proxy variable is statistically significant at the five percent level, confirming earlier findings about the partial correlation without instruments. The coefficients are, in most cases, somewhat larger. This suggests that while multilateral lending has an increasing effect on interest rate spreads in net terms, there also seems to be a lowering gross effect. Multilateral lending may decrease default probabilities by temporarily bridging liquidity shortages of countries in crisis, while rescue packages may dampen recovery rates at the same time. Our IV results thus reconcile the "seniority conundrum" with the conventional view about the effects of bailout packages on interest rates.[4]

Our second empirical approach is to analyze the data of the World Economic Survey conducted by the ifo Institute in April 2013 and July 2015. As part of their worldwide business-climate survey, the ifo added a question about seniority expectations regarding different parts of rescue funds in Europe. At the same time, the survey contains information about interest rate expectations, and other control variables like GDP growth, debt, trade balances, perceived over- or undervaluation of the exchange rate and others. In the spirit of a differences-in-differences analysis, we use this new expert survey to investigate whether participants, who changed their opinion about the seniority stance also changed their interest rate expectations. In a set of probit regressions, we find these effects to be quantitatively important and highly significant.

2. Data and instruments

In order to solve the endogeneity issue, we need a set of instruments that fulfill two criteria: (i) It must be correlated with the share of multilateral loans in total debt, and (ii) under the null hypothesis, it should not have an independent effect on the interest rate.

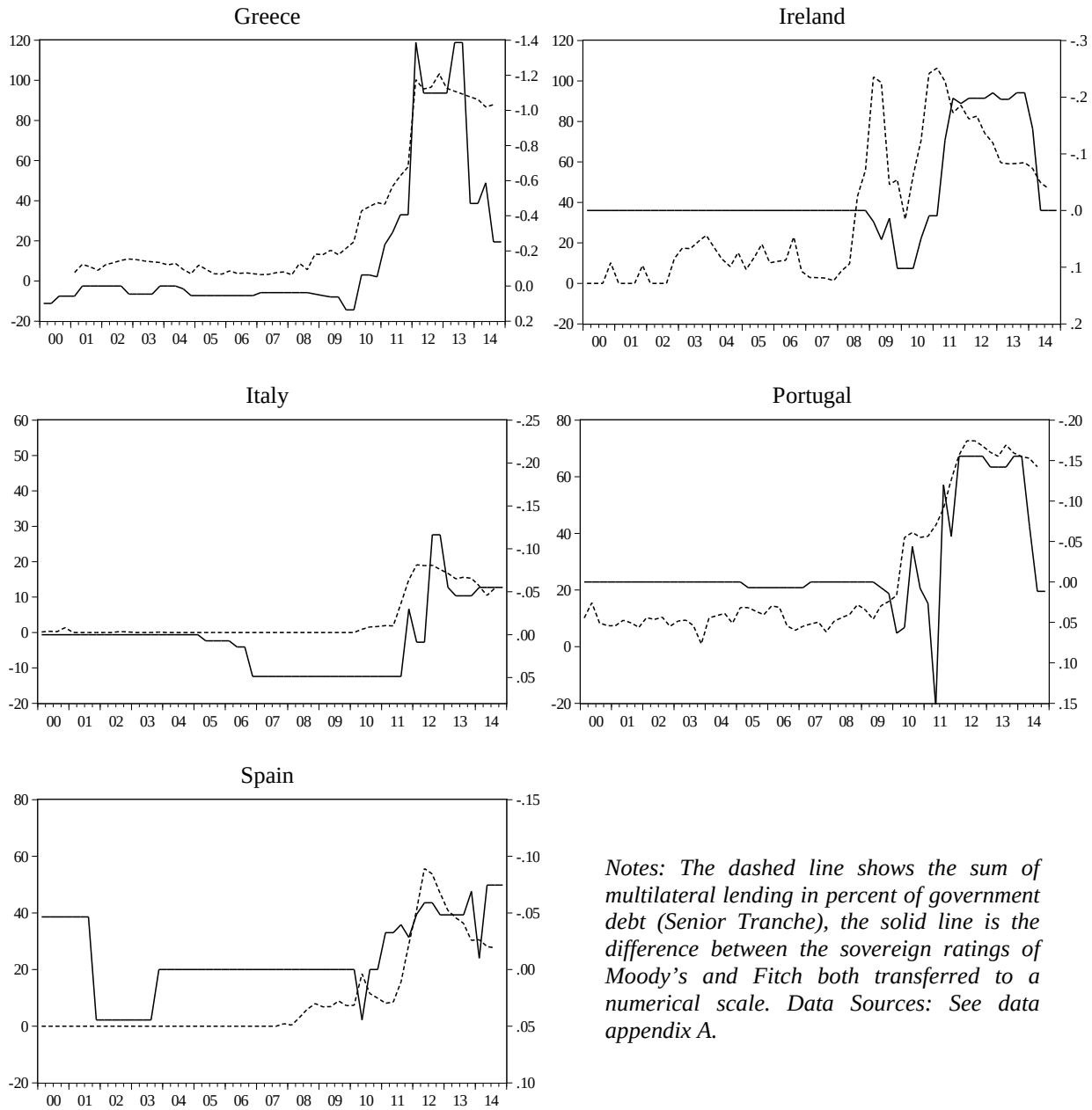
The first instrument we use is based on the evaluations of rating agencies. These ratings are useful to construct instrumental variables for two reasons. Unlike the official sector, they are not policy

[4] Dooley and Stone (1993) and Dooley et al. (1996) point out the empirical relevance of creditor seniority in determining sovereign debt prices during the 1980s Latin American debt crisis. Also, in the cases of the 1998 Russian crisis, seniority clauses seemed to matter, as noted by Kharas et al. (2001). Bulow et al. (1992), on the other hand, argue that official lending has no negative effects on private investors, as the volume effect of official lending is always greater than or equal to the effects of relative subordination. Lastly, Ritschl (1996) argues that post-WWI Germany lost access to international private credit markets because of changes in the seniority stance of reparations – i.e., *already existing* official debt. When discussing historical case studies of seniority, however, one needs to keep in mind that the amount of emergency lending in the case of the euro crisis is unprecedented in its volume (see, e.g., Barkbu et al., 2012).

motivated to target interest rates and reduce spreads. They are designed as neutral observers of the markets and do not intentionally drive interest rates up or down.

Furthermore, they can be used to derive a proxy for expectations about recovery values. The rating agency Moody's jointly assesses the probability of default and the potential loss given default. Standard and Poor's and Fitch, on the other hand, base their assessments on the default probability only (see, for instance, Gaillard, 2011, and references therein). The difference between these two measures is illustrated in Figure 1. This difference is highly correlated with the share of multilateral loans (IMF, EFSF, ESM, etc.) in total government debt. This is particularly the case for Greece and Portugal, and for Ireland, Italy, and Spain to a somewhat lesser extent.

Figure1: Senior Tranche and Rating Differential



Notes: The dashed line shows the sum of multilateral lending in percent of government debt (Senior Tranche), the solid line is the difference between the sovereign ratings of Moody's and Fitch both transferred to a numerical scale. Data Sources: See data appendix A.

3. IV Regressions

In Table 1, Column 1, we first show the partial correlation between the interest rate spreads and the senior tranche proxy in a standard model of interest rates without instruments, used for instance by De Grauwe and Ji (2013). It is an updated version of Table 2 in Steinkamp and Westermann (2014). The senior tranche variable is statistically significant. The strength of the partial correlation indicates that a one percentage point increase in senior tranche lending is associated with an increase in the interest rate spread by 0.064 percentage points. Consistent with De Grauwe and Ji (2013), we also find that countries' real growth is another important determinant of interest rate spreads in the euro area. Other determinants occasionally significant are the debt-to-GDP ratio, the current account as a share of GDP and the real effective exchange rate.

In Columns (2)–(7), we re-estimate this benchmark regression with several different instruments. First, we use the instrument based on rating decisions, described in the previous section. When taking the difference between Moody's and Standards and Poor's ratings (Set A), we find that the coefficient estimate of the parameter is nearly identical to our benchmark. When we use the difference between Moody's and Fitch (Set B) instead, the coefficient becomes substantially larger, with a value of 0.170.

We also use a new approach by Lewbel (2012) that exploits heteroscedasticity in the first stage of the regression. This IV technique yields consistent estimates by imposing higher moment restrictions even when valid external instruments are unavailable or weak. We are using $(\mathrm{Z} - \bar{\mathrm{Z}})\hat{\varepsilon}_1$ as the identifying instrument, where Z is the vector of exogenous variables excluding the senior tranche, $\bar{\mathrm{Z}}$ is the vector of means of the Z variables, and $\hat{\varepsilon}_1$ is the residual of the first-stage regression explaining the senior-tranche variable with the Z variables. A Breusch–Pagan test rejects homoscedasticity of the first-stage regression at the 1% level, indicating that this approach is indeed valid for our dataset. Again, the coefficients are either similar to (Set B), or somewhat larger (Sets C and E) than, our original estimate.

Finally, we also use lagged values of the senior-tranche variable as instruments (Set F). Again, we find that the coefficient increases slightly compared to our benchmark regression, but it is relatively close to our benchmark.

All of our instruments seem strong in the sense that the first-stage regressions have *F*-statistics considerably larger than 10. Thus, they help explain the senior tranche in the first step of the two-stage least squares approach. Furthermore, we do not find evidence of problems associated with under- or overidentifcation.

With regard to the endogeneity of the senior-tranche variable, we find mixed evidence in our specification tests. In the majority of specifications, we do not reject the null that the senior tranche can be treated as exogenous. The results in column (2), however, point to the potential endogeneity of the senior tranche, as the null of exogeneity is rejected at the 5% level of significance. Given this uncertainty about a possible two-sided causality, an instrumental variables approach seems warranted.

Table 1: Two-step Least Squares Instrument Variables Regressions

Dependent Variable: 10y Government Bond Spreads							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		TWO-STEP IV REGRESSIONS					
	SIMPLE OLS	External Instruments		Internal Instruments - Lewbel	Combined Approach		Internal Instruments - Lagged Values
		Set A	Set B	Set C	Set D (A + C)	Set E (B + C)	Set F
Senior Tranche	0.064***	0.063**	0.170***	0.072***	0.061***	0.082***	0.069***
	(4.22)	(1.97)	(3.39)	(3.04)	(3.17)	(3.19)	(3.98)
Debt/GDP	0.006	0.010	-0.077*	-0.001	0.012	-0.008	0.001
	(0.53)	(0.38)	(1.94)	(0.04)	(0.65)	(0.37)	(0.07)
Current Account/GDP	0.015	0.011	-0.051*	0.010	0.012	0.003	0.014**
	(1.06)	(0.55)	(1.69)	(0.56)	(0.75)	(0.16)	(2.15)
REER	0.039	0.116**	-0.116	0.026	0.119***	0.019	0.060*
	(0.84)	(2.08)	(1.43)	(0.69)	(3.54)	(0.47)	(1.84)
Real GDP Growth	-0.293*	-0.273***	-0.234***	-0.288***	-0.274***	-0.283***	-0.295***
	(2.10)	(4.76)	(3.58)	(5.69)	(5.72)	(5.63)	(5.84)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (within)	0.71	0.72	0.52	0.70	0.70	0.69	0.70
Observations	691	674	681	691	674	681	647
First Stage F-Stat.	-	80.573	88.048	106.896	131.124	102.170	120.167
H_0: Underid.	-	13.209***	16.648***	29.358***	33.290***	34.195***	82.515***
H_0: Not Overid.	-	Exactly id.	Exactly id.	4.678	5.773	5.887	5.916
H_0: Exogenous	-	0.007	4.713**	1.657	0.320	1.257	0.039

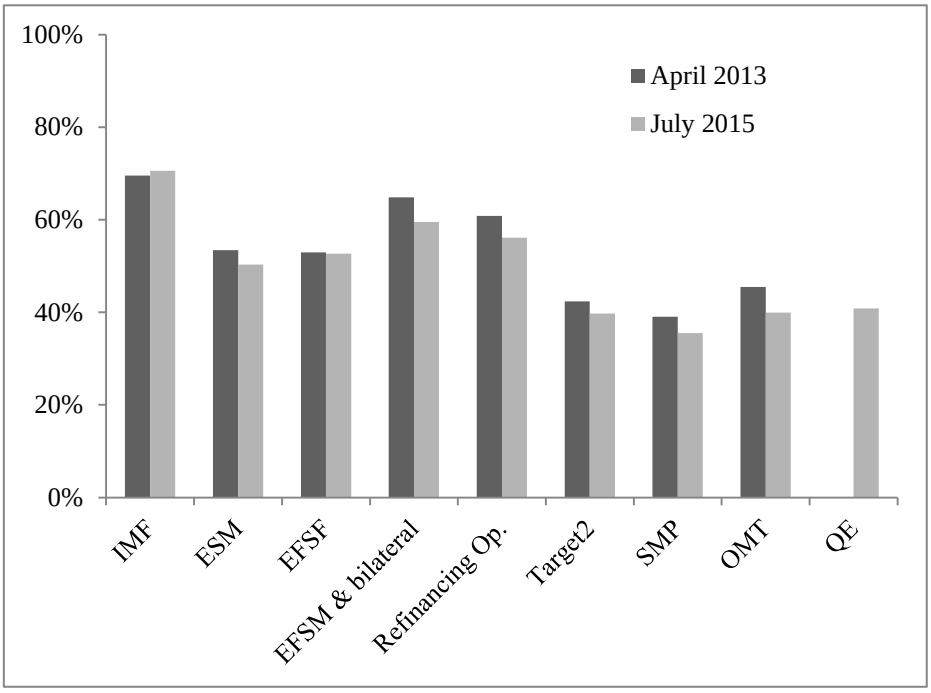
*Notes: Robust t-statistics in parentheses; *, **, *** indicate variables significant at 10%, 5%, and 1% level respectively. Table shows a simple OLS regression in the first column. Columns (2)-(7) report two-step IV regressions using different sets of instrumental variables for senior tranche lending. In the lower part of the table, we report p-values of several specification tests as well as the F-Statistic of excluded instruments from the first stage regression. As an underidentification test, we apply the Kleibergen-Paap rk LM statistic. As a test of overidentification, we use Hansen's J-Statistic. Based on the difference of two Sargan-Hansen statistics, we also test whether the senior tranche can be treated as exogenous. Data Sources: See data appendix A.*

4. Microeconometric Evidence from an Expert Survey

Our second empirical identification approach is to analyze survey data about interest rate expectations. In this survey dataset of individual experts, the endogeneity issue is likely to be considerably smaller than in the macro time series. Furthermore, as the same experts were interviewed twice, we can use the panel structure of our dataset for identification.

The first wave of the survey was conducted by the ifo Institute in Munich in April 2013 and was analyzed in our earlier article (Steinkamp and Westermann, 2014). Survey participants were asked whether they expected certain parts of the rescue funds to have a preferred-creditor treatment in case of default.[5] As Figure 2 illustrates, there were substantial differences among the institutions. The IMF is considered to be the most senior creditor, while the ECB's bond purchases under the Securities Markets Programme (SMP) are expected to be the least senior. Overall, however, a substantial share of respondents expects at least some of the institutions to enforce a preferred treatment.

Figure 2: Seniority Expectations



Notes: Graph shows percentage of respondents expecting the respective type of debt to be treated senior compared to private market creditors (Obs. = 907 in April 2013, Obs. = 823 in July 2015). Data source: World Economic Survey, ifo institute. For details, see data appendix A.

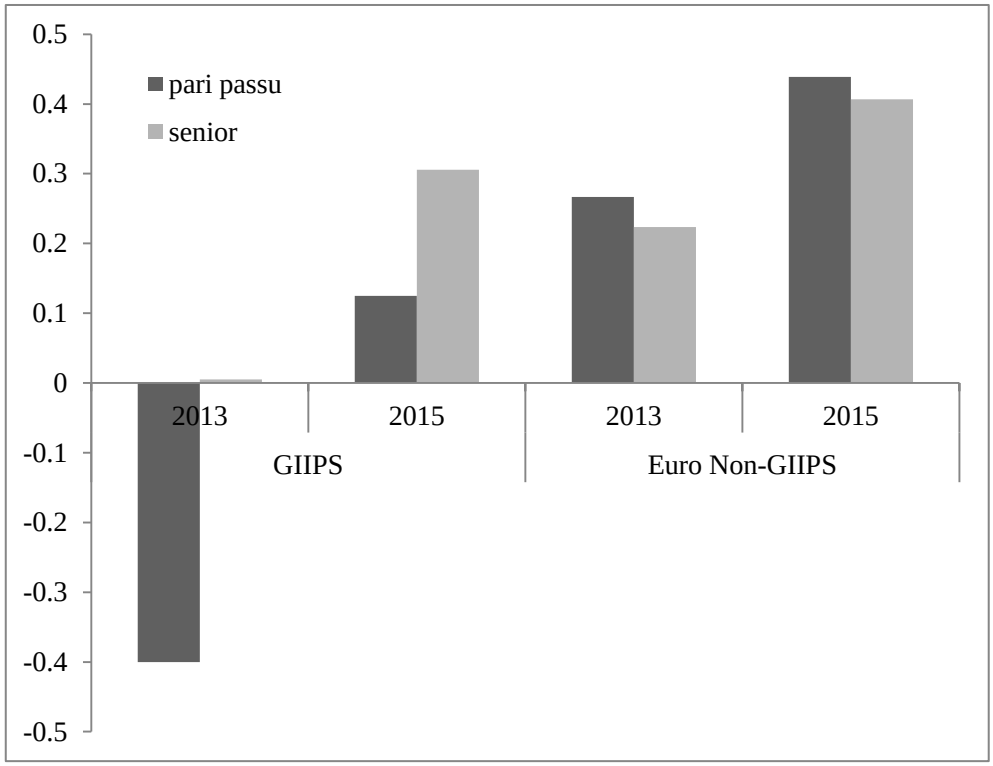
Figure 2 also includes the average responses of the second wave of the survey, conducted in July 2015. Although seniority expectations did not change much on average, there is substantial variation

[5] The exact question was "In a case of default (or debt restructuring) of a member country of the European Monetary Union, do you expect the following public creditors to get preferred treatment (i.e., have senior status), compared to private sector creditors?" See also Appendix B, which discusses questionnaire design, sample composition, and data cleaning in more detail.

over time between the two waves of the survey. Nearly 32% of respondents see either more or less institutions as senior lenders compared to their first answer in April 2013.

These seniority expectations are interesting when compared with the interest rate expectations in different subgroups. Figure 3 shows considerable variation across crisis and non-crisis countries in both surveys.

Figure 3: Interest Rate Expectations



Notes: Table shows the average interest expectation of different subsamples. Expectation is measured [-1, 0, +1] indicating falling, stalling or rising interest rate expectations, respectively. Only euro area respondents with repeated participation in the survey have been included (Obs. = 426). In the case of respondents from the GIIPS countries (Greece, Ireland, Italy, Portugal and Spain) with seniority expectations the interest expectation is – on average – exactly zero. Data source: World Economic Survey, April 2013 and July 2015, ifo institute.

Considering first the respondents in crisis countries, we see that only respondents with pari passu expectations in 2013 also expected interest rates to fall. Those, who expected the institutions to be senior to private markets, expected interest rates to be constant on average. In 2015, we observe a similar pattern: Those with seniority expectations anticipate the interest rate to rise much more strongly.[6] Interestingly, the reversed pattern is visible in the non-crisis euro area countries, which are among the main creditors in the euro crisis: In this subgroup of countries, respondents expected rising interest rates, both in 2013 and 2015. But the magnitude of this expectation is stronger for those respondents who expect the institutions to be treated pari passu with private markets.

[6] The same patterns hold when Cyprus is included in the list of countries in crisis. At the time of the first survey, as of April 2013, Cyprus had not received any rescue credits, which is why we decided to classify Cyprus as a noncrisis country in the following regression analysis and – for consistency – in the graphs above.

More formally, we analyze the survey data in a (panel) probit regression, summarized in Table 2. Our specifications follow a strategy in the spirit of a differences-in-differences analysis: First, we expect the seniority stance to be associated with interest rate expectations, but only in the subsample of crisis countries (i.e., countries that received help from at least one of the above institutions). Second, we exploit differences over time. Respondents changing their mind about the seniority of lenders might also change their expectation about interest rates.

The first aspect is analyzed in columns (1)–(5) of Table 2. Column (1) looks at the influence of the seniority expectation on respondents' probability of expecting a rising interest rate in a pooled probit regression.[7] In this simple regression, we find no statistically significant results. In column (2), we then include an interaction term of the seniority expectation times a dummy for the GIIPS countries (Greece, Ireland, Italy, Portugal, and Spain). A pattern similar to the one visible in Figure 3 emerges: While respondents from GIIPS countries are less likely to expect rising interest rates, the same is not the case if – at the same time – they expect official lenders to enforce a preferred treatment. These effects are statistically significant at the 1% level.

Column (3) adds a set of control variables similar to the macro-level regressions in the first part of the paper. The results remain roughly the same: Respondents from the GIIPS countries are 23.8 percentage points less likely to expect rising interest rates compared to respondents from other countries. However, when these respondents also expect rescue packages to (implicitly) come with senior status, this increases the probability of expecting a rising interest rate by 30.4 percentage points. Again, these results are statistically significant at the 1% level. Other factors influencing the interest rate expectation seem to be the perception of public debt being a problem for the respective country and the expectation about real economic growth. Experiencing a debt problem increases the probability of expecting a rising interest rate by 6.4 percentage points, while an increase in real GDP expectations reduces the probability by 2.0%.

In columns (4) and (5), we analyze the cross-sectional data of each wave of the survey individually. In both regressions, we again find a statistically significant influence of GIIPS respondents' seniority expectations on the probability of expecting rising interest rates. Some differences between the two waves of the survey are visible though. First, the seniority effect seems to be weaker in April 2013, a time when interest rates where on a continuously downward path. Second, while trade deficits and growth expectations seemed to be important factors in determining the interest rate expectation in 2013, debt seems to be back in the focus in 2015.

[7] We also estimated all regressions of Table 2 using ordered probit and linear probability models. The results were very similar but are less intuitively to describe. Results are available upon request.

Table 2: WES Survey Probit Regressions

Dependent Variable: Interest Rate Expectation							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Pooled Probit			Cross-Section Probit		Panel Probit	2SLS-IV Probit
				1st wave	2nd wave		
Senior	0.016	-0.008	0.014	0.030	0.037	0.051	-1.001*
	(0.51)	(0.25)	(0.46)	(0.80)	(0.75)	(0.57)	(1.66)
GIIPS	-0.061	-0.250***	-0.238**	-0.159*	-0.326*	-0.761*	-1.748***
	(1.57)	(3.82)	(2.05)	(1.88)	(1.71)	(1.92)	(3.11)
Senior × GIIPS		0.281***	0.304***	0.154**	0.368**	0.980**	2.487***
		(4.48)	(2.79)	(1.98)	(2.09)	(2.53)	(3.26)
Debt problem			0.064*	0.033	0.089**	0.214***	0.072
			(2.73)	(0.98)	(2.41)	(2.82)	(0.63)
Trade Deficit			0.020	0.057**	-0.012	0.068	-0.079
			(0.96)	(2.09)	(0.35)	(1.04)	(0.64)
Exchange Rate			-0.009	0.005	0.003	-0.038	0.045
			(0.41)	(0.16)	(0.08)	(0.57)	(0.39)
Real GDP Growth			-0.020**	-0.028***	-0.021	-0.058**	-0.062
			(2.34)	(2.95)	(1.47)	(2.09)	(1.34)
Further Controls	no	no	yes	yes	yes	yes	yes
Random Effects	no	no	no	no	no	yes	no
(Pseudo) R^2	0.00	0.01	0.01	0.06	0.03	0.03	0.02
Obs.	1035	1035	958	440	412	852	941

*Notes: Table shows estimated average marginal effects of different probit models. z-values are given in parentheses. *, **, *** indicate significance at the 10%, 5%, or 1% level respectively. Standard errors are clustered at the country level, resulting in roughly 120 clusters. The dependent variable is coded 1 if respondents expect rising interest rates, zero otherwise. The seniority dummy is 1 if respondents expect at least half of the official creditors to be senior, zero otherwise. We control for the participants assessment of how much of a problem they see in the countries debt level (coded [0, 1, 2] for "not important", "very important" and "most important", respectively), their expectation about the development of the trade balance [%], the real GDP growth [%] and the expected direction of change in the exchange rate compared to the US dollar. Survey participants have also been asked about their assessment on how much of a problem they see in the issues like competitiveness, public deficits, trade openness, capital shortage, government policy, inflation and unemployment. These variables are included in the "further controls" set. Data source: World Economic Survey, April 2013 and July 2015, ifo Institute. See also data appendix B.*

In column (6), we use the time variation in our dataset. Estimating a panel probit model with random effects enables us to control for unobserved heterogeneity across respondents.[8] The results are quite comparable to the cross sections but the magnitudes of the coefficients are even greater.

As a further robustness check, we exploit the panel structure in the dataset to estimate a two-step instrumental variable regression, presented in column (7). As instruments for the seniority expectations, we use the first lagged values – i.e., respondent's seniority expectation from the first wave of the survey.[9] In line with the previous results, the seniority effect remains statistically significant in this regression, albeit with yet higher coefficients. In net terms, respondents from GIIPS countries with seniority expectation have a 73.9-percentage-point increased probability of expecting a rise in interest rates – again compared to non-GIIPS respondents without seniority expectation. Furthermore, we find no evidence of an endogeneity problem of the Senior and Senior×GIIPS variables in the survey dataset: A Wald test does not discard the null of exogeneity at any common level of statistical significance ($\chi_2^2 = 3.13, \text{Prob} > \chi^2 = 0.21$).

5. Conclusions

Rescue packages' seniority clauses can have unintended side effects. The European Central Bank, for instance, recognized the importance of this issue when designing the Outright Monetary Transactions (OMT) program, which followed the earlier Securities Markets Program (SMP). Both programs are buying government bonds of countries in crisis on secondary markets. However, while the earlier SMP program was explicitly senior, the ECB promised to treat the OMT program pari passu. Interestingly, interest rates started to rise after the SMP interventions, but declined when the OMT program was announced.

In this paper, we provide further evidence of the empirical link of creditor seniority and interest rate spreads in a panel-regression framework. Our findings are consistent with a causal positive impact of the share of multilateral loans in total government debt on interest rate spreads in Europe. The magnitude of coefficients in the majority of our IV regressions suggests that this partial positive effect coexists with a reduction of interest rates that may be triggered by the absolute level of rescue packages themselves. We, thus, reconcile what some authors have termed the seniority conundrum of rescue packages with a more conventional view of rescue packages as a means to lower the funding costs of countries in crisis.

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[8] We choose random effects over fixed effects because MLE does not consistently estimate coefficients in a nonlinear model with fixed effects.

[9] Furthermore, the first-stage regression fulfills the common rule of thumb of an F-statistic greater 10, indicating that the instrument is not a weak one. In addition to the IV-probit regression, we also estimated an ordered probit model and a linear probability model in a two-stage IV regression. Again, the results remain robust. Also, we follow the extensively developed literature on specification testing in the linear model and find no evidence of weak-, over-, or underidentification.

In a survey dataset, we document that this finding is consistent with expectations of economic experts. We show that those survey participants who believe that rescue institutions will have a senior status also expect higher interest rates. In a set of (panel) regressions, we also document that this difference is statistically significant.

From a policy perspective, these findings are important for the design of future bailout packages and emergency lending. They suggest that the institutions involved should be aware that interest rate spreads are more closely related to a theoretical asset-price model, based on fundamentals and seniority rankings, than the earlier literature has found. They may furthermore face the predicament that loans with a super-senior status – as currently have been debated in the case of Greece – may increase net funding costs and impede the subject country's access to private capital markets.

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7. Appendix A: Data Appendix for Macro-Level Regressions

Table 3: Data Sources and Definitions

Variable	Definition	Sources	Notes
Interest Rate Spread	Spread of the countries' secondary market yield of a composite 10-year government bond vis-a-vis Germany [% pts.]	OECD - Monthly Monetary and Financial Statistics (Series: 'Long-term interest rates, Per cent per annum'), For gaps in series of Luxembourg: International Financial Statistics (Series: 'Interest Rates, Government Securities, Government Bonds', Code: 61. . .ZF)	
Senior Tranche	Amount of multilateral lending and official institutions' debt holdings relative to total gross government debt [%]	(i) IMF loans: International Financial Statistics (Series: 'Use of Fund Credit (UFC)'; Code: .2TL.ZF); (ii) EFSM and bilateral loans: Websites of the European Commission (http://ec.europa.eu/economy_finance/ eu_borrower/efsm/), Ministerial statements of HM Treasury; (iii) TARGET2-loans: national central bank's balance sheets (see Steinkamp and Westermann (2014) for details); (iv) EFSF/ESM loans: Websites of the European Financial Stability Facility (http://www. efsf.europa.eu) and the European Stability Mechanism (http://www.esm.europa.eu); (v) Securities Markets Programme: Thomson Reuters Datastream (Series: 'Sec. Markets Prog. Amount'; Code: S244FC)	With regard to the SMP holdings, we assume the ECB bought the bonds equally distributed in the same relative amounts as it held in the end of 2012 (see ECB press release February 21st , 2013). We exclude loans of about 1 bn. € from Sweden and Denmark to Ireland since the exact disbursement dates are unknown.
Ratings	Sovereign ratings from S&P, Moody´s and Fitch [numerical scale]	"Fitch – Complete Sovereign Rating History", Feb 14, 2014; Moody´s "sovereign rating history", June 14, 2013; Standard and Poor´s Website. Updated using Bloomberg news.	We follow the common approach to transform ratings into a linear numerical scale (see, e.g., Afonso et al. (2012), Kräussl (2005)).
Debt/GDP	General gross government debt relative to GDP [%]	Eurostat (Series: 'Gross Government Debt'; Code: gov_q_ggdebt)	
Current Account/GDP	(Net) current account balance relative to GDP [%]	Eurostat (Series: 'Current Account'; Code: bop_q_c) until 2013Q4, updated to 2014Q4 using national central bank data.	For Belgium, data for 2000Q1 to 2001Q4 are unavailable.
REER	Real effective exchange rate, based on the consumer price index (2005=100)	International Financial Statistics (Series: 'Real Effective Exchange Rate, Consumer Price Index'; Code: ..RECZF)	
Real GDP Growth	Year-on-year percentage change of real gross domestic product	International Financial Statistics (Series: 'Gross Domestic Product, Real'; New code: NGDP_R)	

Notes: We thank Ashoka Mody and Milan Nedeljkovic for replicating our original dataset and pointing out some corrections of the disbursement dates of multilateral loans in Steinkamp and Westermann (2014).The corrected and updated dataset is available upon request (regression results in our earlier paper were not affected).

8. Appendix B: Data Appendix for Micro-Level Regressions

Sample, Variables and Questionnaire Design

Since 1981, the ifo Institute has asked about 1,000 experts worldwide about development in their country. These respondents are on average well-informed people who work in leading positions or conduct economic research within their institutions. About 65% of the panelists work for international corporations, 10% work each in economic research institutes and chambers of commerce, 5% in consulates and embassies and the last 5% in multilateral organizations (such as OECD and IMF), foundations, media or small-scale enterprises. More information on the ifo's survey datasets in general, and the World Economic Survey in particular, can be found in Seiler (2012) and in the references therein. A complete description of the variables used in our survey regression analysis can be found on the webpage of the ifo (doi: 10.7805/ebdc-wes-2014).

The ifo Institute allowed us to add the question displayed in Figure 4 on seniority expectations to their regular World Economic Survey in April 2013 and July 2015.

Figure 4: WES question on seniority expectations

11. In a case of default (or debt restructuring) of a member country of the European monetary union, do you expect the following public creditors to get **preferred treatment** (i.e. have senior status),

each compared to private sector creditors?

	yes	no
- International Monetary Fund, IMF	☐	☐
- Permanent rescue facility, ESM	☐	☐
- Temporary rescue facility, EFSF	☐	☐
- European Union (EFSM and bilateral)	☐	☐
- European System of Central Banks (incl. ECB)		
A) Collateralized Refinancing Operations	☐	☐
B) Target2 claims	☐	☐
C) Old bond purchase program, SMP	☐	☐
D) New bond purchase program I, OMT	☐	☐
E) New bond purchase program II, QE	☐	☐

Notes: Figure 4 shows the seniority question as it was asked in the survey of July 2015. In April 2013 the same question had been asked before, only without item E). Source: World Economic Survey, ifo Institute, July 2015.

Panel Structure and Data Cleaning

The dataset consists of 705 repeated observations for the two waves of the survey. However, we choose to drop 29 of these observations before performing our analysis. In 25 cases, the identifier could not uniquely be attributed to the same respondent. For example, sometimes a successor answered because the original respondent retired or changed job positions. Furthermore, we dropped four respondents who moved between the two interviews such that their answers refer to different home countries.