that Portuguese and Greek banks were the first to face considerable premia for overnight borrowing, starting already before the Greek rescue package. Italian and Spanish banks held up relatively well until the summer of 2011, but ultimately faced a dramatic surge in funding costs that only came to a halt after the first 3-year LTRO. The re-ignition of the European sovereign debt crisis in summer 2012 particularly hit Spanish institutions, while Italian banks appeared to have been largely insulated against this shock. While Draghi's speech in London and the successive OMT announcement reduced market tensions significantly, some market segments still remained fragmented at the end of the sample period.

Table 2: Regression coefficients for borrowing rates

This table contains the regression coefficients from estimating the decomposition of banks' borrowing rates in equation (1). The first four columns are based on an estimation for two country groups (stressed and non-stressed) and report the average premium paid by banks from stressed countries relative to banks from non-stressed countries as well as the effects of being in the respective rating category, relative to banks with a high credit rating. The remaining columns are based on an estimation with the full set of country*time fixed effects and tabulate the estimated premia for banks from individual countries, relative to Germany. P-values in brackets are based on standard errors clustered at the bank level, and ***, **, and * denotes significance at the 1%, 5%, and 10% level, respectively. The sub-periods are defined in footnote 5.

| | | Rating | | | Individual Countries (relative to DE) | | | | | | |
	Stressed	Medium	Low	None	AT	ES	FR	GR	IT	NL	PT
Pre Lehman	1.07	-1.66	-7.62	-1.19	0.47	-4.89*	-3.24	3.85**	2.00	-6.07***	
	(0.43)	(0.26)	(0.38)	(0.43)	(0.81)	(0.07)	(0.41)	(0.03)	(0.22)	(0.01)	
Post Lehman 1	-1.51	-4.82	-4.91	-1.26	-5.89	-5.24	-11.88	14.56	-20.62***	-12.72	
	(0.78)	(0.57)	(0.74)	(0.87)	(0.51)	(0.55)	(0.49)	(0.15)	(0.01)	(0.21)	
Post Lehman 2	3.17*	-0.46	5.37	6.35**	-1.60	4.12	-2.22	8.36***	-5.33***	-2.45	16.68**
	(0.09)	(0.84)	(0.50)	(0.03)	(0.56)	(0.36)	(0.35)	(0.01)	(0.01)	(0.45)	(0.05)
Post GR Support	9.83***	3.11	20.19***	10.42***	-3.63**	6.65**	-2.72	19.79**	2.80	-6.74***	23.91***
	(0.00)	(0.11)	(0.00)	(0.00)	(0.04)	(0.02)	(0.13)	(0.02)	(0.15)	(0.00)	(0.00)
Post IE Support	14.76***	3.70	19.77**	6.79***	-0.05	13.35***	-5.13	13.16	10.06***	-3.24	27.40***
	(0.00)	(0.12)	(0.02)	(0.01)	(0.99)	(0.00)	(0.14)	(0.19)	(0.00)	(0.28)	(0.01)
Post PT Support	5.65**	2.86	22.61***	9.05***	-2.25	5.79	-2.96	27.53***	1.30	-0.85	11.94
	(0.02)	(0.29)	(0.00)	(0.00)	(0.55)	(0.15)	(0.29)	(0.00)	(0.63)	(0.86)	(0.17)
Summer 2011	26.26***	5.06*	19.57***	17.86***	-1.29	30.37***	3.91	86.07***	17.16***	-2.20	29.11**
	(0.00)	(0.08)	(0.00)	(0.00)	(0.70)	(0.00)	(0.23)	(0.00)	(0.00)	(0.48)	(0.02)
Fall 2011	63.02***	1.55	11.39	30.46***	1.07	60.49***	12.30***	84.80***	70.35***	6.14	45.89**
	(0.00)	(0.82)	(0.22)	(0.00)	(0.82)	(0.00)	(0.00)	(0.00)	(0.00)	(0.25)	(0.01)
Post LTROs	17.25***	-0.54	13.07**	12.87***	-3.79*	10.86***	0.74	117.08***	2.05	-2.40	44.42***
	(0.00)	(0.83)	(0.04)	(0.00)	(0.08)	(0.00)	(0.72)	(0.00)	(0.27)	(0.52)	(0.00)
Summer 2012	21.21***	4.89*	-1.38	15.89***	1.20	32.44***	3.31	66.13***	10.18***	2.92	41.84***
	(0.00)	(0.08)	(0.80)	(0.00)	(0.77)	(0.00)	(0.34)	(0.00)	(0.00)	(0.42)	(0.01)
Post Speech	13.51***	0.69	-3.54	5.88***	0.97	24.45***	3.15*	44.36***	5.21**	6.88	34.99***
	(0.00)	(0.46)	(0.35)	(0.01)	(0.71)	(0.00)	(0.06)	(0.00)	(0.03)	(0.12)	(0.00)

4.2. Funding ability

As in the previous section, we first present the results based on an estimation with only two country groups. Fig. 3 depicts the estimated time-series for $\hat{\phi}_t^S$, the relative funding ability of

banks from stressed countries. An estimate of -0.1 implies that a bank from a stressed country is able to satisfy 10% less of its funding needs from the private market compared to bank from a non-stressed country with comparable credit risk. The regression coefficients based on sub-periods are tabulated in the first column of Table 3.

Figure 3: Relative funding ability for banks from stressed countries

This figure depicts the estimated average funding ability for banks from stressed countries relative to banks from non-stressed countries based on applying the decomposition in equation (1) to the measure $\phi_{i,t}$. The dashed lines indicate the 95% confidence interval based on standard errors clustered at the bank level.
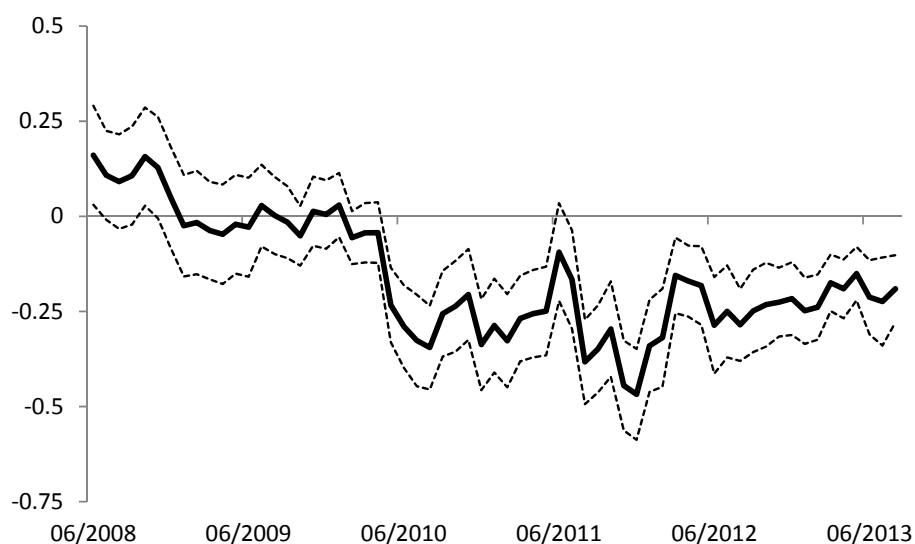
Overall, the results from this analysis closely mirror the above results on fragmentation in borrowing rates. The first incidence of fragmentation in terms of funding ability occurs in May 2010, coinciding with the Greek bailout programme. In the following, short periods of relief take turns with episodes of stress on peripheral sovereigns, and the largest extent of fragmentation is reached in December 2011 just before the allotment of the first 3-year LTRO. Clearly, the ability to obtain cheap long-term funding significantly reduced banks' need to resort to the ECB's weekly operations. While the market displayed a slow movement towards re-integration in the following months, considerable fragmentation in terms of access to short-term funding remained at the end of the sample period.

The coefficients on the different rating categories in Table 3 (columns 2 to 4) reveal that banks of lower credit quality find it more difficult on average to obtain funding in the private market. However, as for rates, this effect appears to have been largely confined to periods of severe market stress.

Turning to the results for the individual countries (again resulting from a separate estimation using the full set of country*time effects), we observe that banks from most countries relied less on public funding that the average German bank around the Lehman Bankruptcy, which is consistent with our earlier observations on borrowing rates. Throughout the Euro sovereign debt crisis, there was relatively little variation in funding ability among non-stressed countries. For stressed countries however, one can observe the same two-sided picture as before. While the policy interventions were largely successful in addressing the deteriorating situation of Spanish and in particular Italian banks, both Greek and Portuguese institutions were effectively locked out of the market since the beginning of the sovereign debt crisis, and this was still the case in August 2013.

Table 3: Regression coefficients funding ability

This table contains the regression coefficients from estimating the decomposition of banks' funding ability in equation (1). The first four columns are based on an estimation for two country groups (stressed and non-stressed) and report the average funding ability of banks from stressed countries relative to banks from non-stressed countries as well as the effects of being in the respective rating category, relative to banks with a high credit rating. The remaining columns are based on an estimation with the full set of country*time fixed effects and tabulate the estimated funding ability for banks from individual countries, relative to Germany. P-values in brackets are based on standard errors clustered at the bank level, and ***, **, and * denotes significance at the 1%, 5%, and 10% level, respectively. The sub-periods are defined in footnote 5.

		Rating			Individual Countries (relative to DE)						
	Stressed	Medium	Low	None	AT	ES	FR	GR	IT	NL	PT
Pre Lehman	0.12**	-0.03	0.11	0.15**	0.15	0.20**	0.26**	0.01	0.31***	0.37***	
	(0.04)	(0.71)	(0.53)	(0.03)	(0.17)	(0.02)	(0.02)	(0.94)	(0.00)	(0.00)	
Post Lehman 1	0.06	-0.23***	-0.20	0.06	-0.08	0.05	0.06	-0.15	0.23***	0.23*	
	(0.29)	(0.00)	(0.24)	(0.40)	(0.54)	(0.53)	(0.67)	(0.22)	(0.00)	(0.05)	
Post Lehman 2	-0.04	-0.15***	-0.26***	-0.04	-0.02	-0.07	0.07	-0.30***	0.09*	0.05	-0.06
	(0.31)	(0.00)	(0.00)	(0.34)	(0.85)	(0.30)	(0.31)	(0.00)	(0.08)	(0.49)	(0.50)
Post GR Support	-0.28***	-0.10	-0.27***	0.01	-0.25***	-0.41***	0.01	-0.72***	-0.14***	0.01	-0.41***
	(0.00)	(0.11)	(0.01)	(0.82)	(0.01)	(0.00)	(0.84)	(0.00)	(0.01)	(0.87)	(0.00)
Post IE Support	-0.29***	-0.10	-0.44***	-0.02	-0.08	-0.28***	0.13***	-0.57***	-0.21***	-0.02	-0.32***
	(0.00)	(0.13)	(0.00)	(0.76)	(0.52)	(0.00)	(0.01)	(0.00)	(0.00)	(0.81)	(0.01)
Post PT Support	-0.23***	-0.13*	-0.38***	-0.04	0.02	-0.09	0.21***	-0.56***	-0.11	0.17**	-0.33***
	(0.00)	(0.06)	(0.00)	(0.55)	(0.87)	(0.31)	(0.00)	(0.00)	(0.11)	(0.02)	(0.01)
Summer 2011	-0.31***	-0.14**	-0.24***	0.01	-0.11	-0.25***	-0.15	-0.57***	-0.31***	0.06	-0.41***
	(0.00)	(0.03)	(0.00)	(0.85)	(0.40)	(0.00)	(0.15)	(0.00)	(0.00)	(0.37)	(0.00)
Fall 2011	-0.47***	-0.20***	-0.22***	-0.05	-0.20	-0.37***	-0.26*	-0.66***	-0.60***	0.03	-0.43***
	(0.00)	(0.00)	(0.01)	(0.42)	(0.14)	(0.00)	(0.07)	(0.00)	(0.00)	(0.57)	(0.00)
Post LTROs	-0.25***	-0.04	-0.20***	-0.08*	-0.07	-0.11*	-0.06	-0.73***	-0.27***	-0.02	-0.42***
	(0.00)	(0.21)	(0.00)	(0.05)	(0.42)	(0.10)	(0.20)	(0.00)	(0.00)	(0.84)	(0.00)
Summer 2012	-0.26***	-0.03	-0.18***	-0.04	0.04	-0.26***	-0.14**	-0.60***	-0.18***	-0.05	-0.51***
	(0.00)	(0.21)	(0.00)	(0.30)	(0.11)	(0.00)	(0.04)	(0.00)	(0.00)	(0.45)	(0.00)
Post Speech	-0.21***	0.00	-0.06	0.04	-0.01	-0.17***	-0.08**	-0.48***	-0.09**	0.01	-0.51***
	(0.00)	(0.86)	(0.17)	(0.10)	(0.68)	(0.00)	(0.03)	(0.00)	(0.01)	(0.40)	(0.00)

6. Conclusion

This paper has examined the degree of fragmentation of the Euro Area overnight unsecured money market from June 2008 to August 2013 based on loans identified from payments data. Our analysis is based on (risk-adjusted) borrowing rates and banks' ability to satisfy their funding needs, controlling for resort to short-term central bank liquidity. Several episodes of market fragmentation are identified. Overall, the evidence suggests that non-standard measures such as long-term liquidity operations were broadly effective in dampening market tensions. However, considerable market fragmentation remained at the end of the sample period.

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