

Online Appendix

“Reciprocal Lending Relationships in Shadow Banking ”

Figure A.1: **Bank CDS spreads**

This figure plots average bank CDS spreads in different regions (in basis points) over the sample period from Nov. 2010 to Oct. 2015. Specifically, I use 5-year CDS spreads on senior unsecured debt of banks as a proxy for banks' credit risks that may concern MMFs.

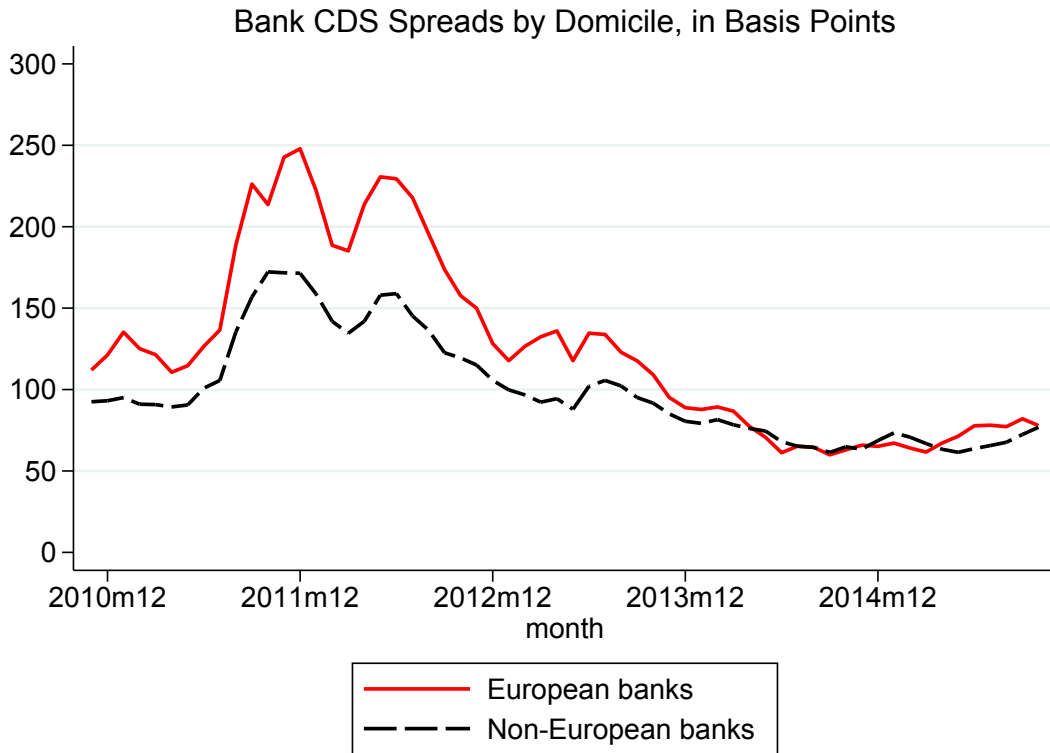


Table A.1: **Robustness on reciprocal lending: two-way fixed effects**

This table presents robustness tests for reciprocal lending, fully saturating the regressions with Date×Bank, Date×Fund, and Fund×Bank fixed effects at the same time. The dependent variable is the net change in outstanding amount of CDs (with time to maturity, or Mat, over 30 days) between fund i and bank j over a six-month period (month m to $m + 6$), scaled by the lending limit imposed by the SEC between fund i and bank j (i.e., 5% of the AUM of fund i), in percent. Time Deposit Dummy $_{i,j,t}$ equals 1 if fund i and bank j engage in any time deposit transactions on month-ends m to $m + 2$, and zero otherwise. Dependence controls $_{i,j,t}$ are defined in (5.2) and (5.3). Standard errors are three-way clustered at the fund, bank, and date level with corresponding t -values in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Normalized $\Delta CD_{i,j,t}$ (mat>30 days)			
	(1)	(2)	(3)
	All	Foreign	Domestic
Time Deposit Dummy $_{i,j,t}$	4.349*** (8.47)	4.876*** (8.75)	1.403* (2.17)
Dependence controls $_{i,j,t}$	Yes	Yes	Yes
Date FE	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
Date × Bank FE	Yes	Yes	Yes
Date × Fund FE	Yes	Yes	Yes
Fund × Bank FE	Yes	Yes	Yes
Adjusted R^2	0.105	0.112	0.096
N of obs	321,180	262,297	58,883

Table A.2: **Alternative story: relationships build from overnight to long-term?**

The sample for this table is restricted to fund-bank pairs with pre-existing longer-term CD lending. The dependent variable is the net change in outstanding amount of CDs (with time to maturity, or Mat, over 30 days) between fund i and bank j over a six-month period (month m to $m + 6$), scaled by the lending limit imposed by the SEC between fund i and bank j (i.e., 5% of the AUM of fund i), in percent. Time Deposit Dummy $_{i,j,t}$ equals 1 if fund i and bank j engage in any time deposit transactions on month-ends m to $m + 2$, and zero otherwise. Fund Flow $_{i,t+1}$ represents net investor flows of fund i (in percent) over the same six-month window as the dependent variable. Dependence controls $_{i,j,t}$ are defined in (5.2) and (5.3). Fund-level controls $_{i,t}$ include log(Fund Size), Fund WAM, Fund Yield, and Num of Banks. Bank-level controls $_{j,t}$ include log(Bank Size) and Num of Funds. Standard errors are three-way clustered at the fund, bank, and date level with corresponding t -values in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable: normalized $\Delta CD_{i,j,t}$ (mat>30 days)						
	All		Foreign		Domestic	
	(1)	(2)	(3)	(4)	(5)	(6)
Time Deposit Dummy $_{i,j,t}$	4.634*** (7.84)	3.616*** (8.41)	4.828*** (7.61)	3.800*** (8.17)	2.757** (2.84)	2.263** (2.78)
Fund Flow $_{i,t+1}$	0.112*** (5.42)	0.110*** (5.61)	0.117*** (4.98)	0.116*** (5.19)	0.059*** (3.22)	0.058** (3.12)
Dependence controls $_{i,j,t}$	Yes	Yes	Yes	Yes	Yes	Yes
Fund-level controls $_{i,t}$	Yes	Yes	Yes	Yes	Yes	Yes
Bank-level controls $_{j,t}$	Yes	No	Yes	No	Yes	No
Date FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Date \times Bank FE	No	Yes	No	Yes	No	Yes
Adjusted R^2	0.071	0.119	0.075	0.122	0.057	0.117
N of obs	160,592	160,576	140,865	140,856	19,727	19,720

Table A.3: **Alternative story: reciprocity driven by same-parent funds and banks?**

The sample for this table excludes fund-bank pairs with the same parents. The dependent variable is the net change in outstanding amount of CDs (with time to maturity, or Mat, over 30 days) between fund i and bank j over a six-month period (month m to $m+6$), scaled by the lending limit imposed by the SEC between fund i and bank j (i.e., 5% of the AUM of fund i), in percent. Time Deposit Dummy $_{i,j,t}$ equals 1 if fund i and bank j engage in any time deposit transactions on month-ends m to $m+2$, and zero otherwise. Fund Flow $_{i,t+1}$ represents net investor flows of fund i (in percent) over the same six-month window as the dependent variable. Dependence controls $_{i,j,t}$ are defined in (5.2) and (5.3). Fund-level controls $_{i,t}$ include log(Fund Size), Fund WAM, Fund Yield, and Num of Banks. Bank-level controls $_{j,t}$ include log(Bank Size) and Num of Funds. Standard errors are three-way clustered at the fund, bank, and date level with corresponding t -values in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable: normalized $\Delta CD_{i,j,t}$ (mat>30 days)						
	All		Foreign		Domestic	
	(1)	(2)	(3)	(4)	(5)	(6)
Time Deposit Dummy $_{i,j,t}$	3.824*** (7.58)	3.293*** (7.84)	4.319*** (7.77)	3.686*** (7.89)	1.210** (2.59)	1.195** (2.51)
Fund Flow $_{i,t+1}$	0.052*** (4.35)	0.052*** (4.34)	0.059*** (4.13)	0.059*** (4.12)	0.022** (2.43)	0.022** (2.41)
Dependence controls $_{i,j,t}$	Yes	Yes	Yes	Yes	Yes	Yes
Fund-level controls $_{i,t}$	Yes	Yes	Yes	Yes	Yes	Yes
Bank-level controls $_{j,t}$	Yes	No	Yes	No	Yes	No
Date FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Date \times Bank FE	No	Yes	No	Yes	No	Yes
Adjusted R^2	0.043	0.086	0.049	0.089	0.028	0.084
N of obs	318,979	318,979	261,338	261,338	57,641	57,641

Table A.4: **Robustness on reciprocal pricing**

This table presents robustness tests on the pricing effects of reciprocal lending, using the amount of time deposit transaction as independent variables. The dependent variable is the yield of CD contract k between fund i and bank j at time t , with CD k 's size larger than \$1 million and time to maturity more than 30 days. TD Amount $_{i,j,t-1}$ is the average time deposit transaction amount between fund i and bank j at the most recent three month-ends, in million dollars. CD Size $_{i,j,k,t}$ is in million dollars and CD Maturity $_{i,j,k,t}$ is days to maturity. Dependence controls $_{i,j,t}$ are defined in (5.2) and (5.3). Fund-level controls $_{i,t}$ include log(Fund Size), Fund WAM, and Num of Banks. Bank-level controls $_{j,t}$ include log(Bank Size) and Num of Funds. Standard errors are three-way clustered at the fund, bank, and date level with corresponding t -values in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable: CD yield $_{i,j,k,t}$						
	All		Foreign		Domestic	
	(1)	(2)	(3)	(4)	(5)	(6)
log(TD Amount $_{i,j,t-1}$)	-0.288*** (-4.29)	-0.191*** (-3.03)	-0.283*** (-4.27)	-0.195*** (-3.11)	0.032 (0.08)	0.040 (0.24)
log(CD Size $_{i,j,k,t}$)	-1.227*** (-4.23)	-1.174*** (-3.91)	-1.261*** (-4.05)	-1.234*** (-3.93)	-0.837*** (-4.09)	-0.437*** (-4.08)
log(CD Maturity $_{i,j,k,t}$)	4.263*** (10.13)	4.126*** (9.77)	4.274*** (9.65)	4.207*** (9.35)	3.024*** (6.49)	2.738*** (9.13)
Dependence controls $_{i,j,t}$	Yes	Yes	Yes	Yes	Yes	Yes
Fund-level controls $_{i,t}$	Yes	Yes	Yes	Yes	Yes	Yes
Bank-level controls $_{j,t}$	Yes	No	Yes	No	Yes	No
Date FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Date \times Bank FE	No	Yes	No	Yes	No	Yes
Adjusted R^2	0.462	0.489	0.426	0.478	0.874	0.741
N of obs	183,614	183,535	168,772	168,723	14,842	14,812