The Impact of Primary Bond Dealers' Maturity Choice on Repo Market Interest Rates

Vladimir Sokolov

ICEF, Higher School of Economics

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- In order to reconcile this evidence I use predictions of Duffie (JF, 1996) and Krishnamurthy (JFE, 2002) models that show that if the supply of bonds is fixed, variation in the demand for bonds has an impact on the price of loanable funds (*repo rates*) against these bonds

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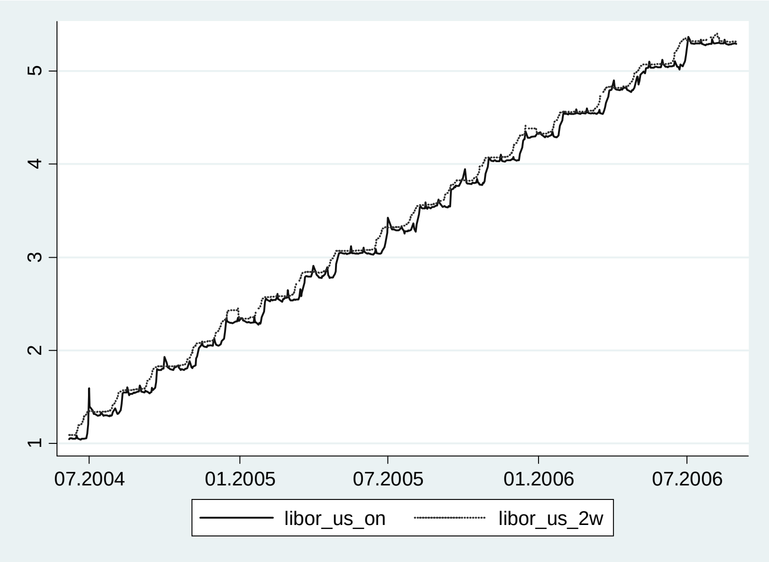
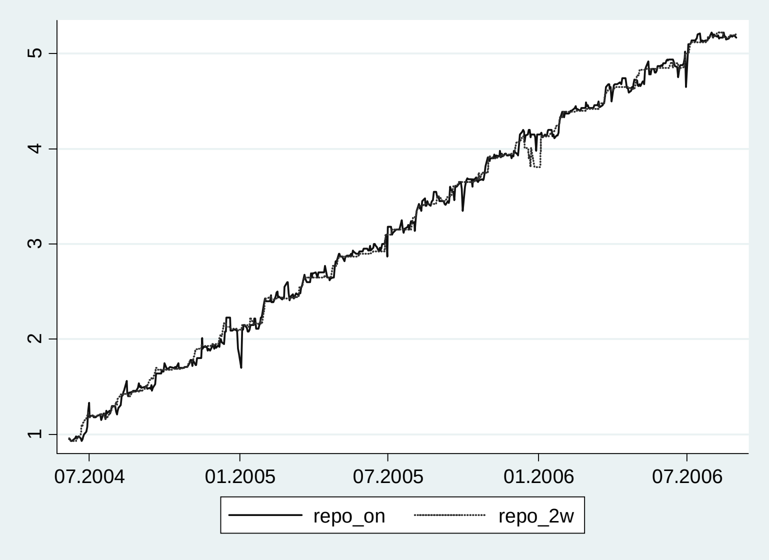
- I show that the repo market term premium variation is related to variation of bond dealers' overnight and term repo positions

LIBOR term spread



REPO term spread



Repo mechanics

- Under repurchase (repo) transaction funds are borrowed against bonds provided as collateral. A repo rate is paid by the *cash-taker (collateral-provider)* to the *cash-provider (collateral-taker)*

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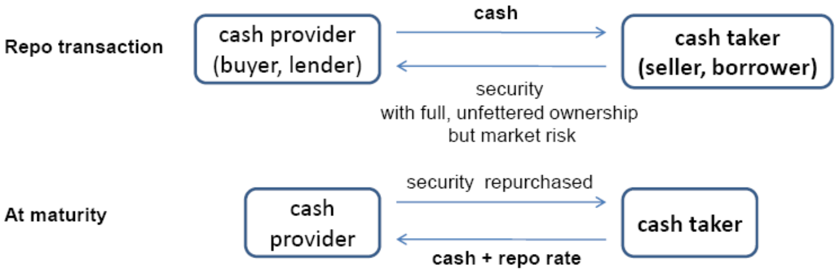
- 

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- Gorton and Metrick (NBER, 2009) study the "repo run" on Bear Sterns

Primary bond delears financing data

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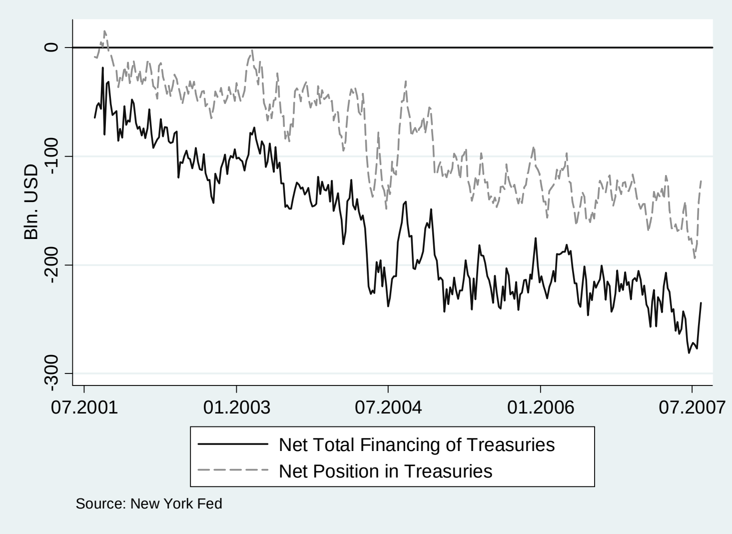
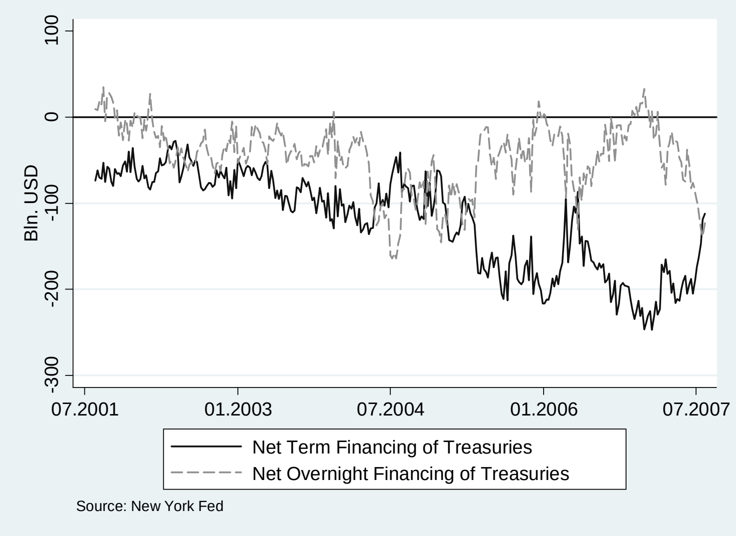
- Similarly as in Fleming and Adrian (2005), I determine dealers' net financing as the value of Treasury *bonds out* minus the value of Treasury *bonds in*. However, I do this separately for the overnight and term financing segments

Dynamics of primary bond dealers' Net positions and Net total financing in Treasuries



Dynamics of primary bond dealers' Net term and Net overnight financing of Treasuries



Summary statistics of primary bond dealers' financing. Sample period: 11.07.2001 - 15.09.2008

	Mean	**Std.Dev**	**Max**	**Min**	**N**	ρ
Net O/N financing	-35356	47170	167644	-164025	357	0.8873
Net term financing	-134323	62929	-27547	-335221	357	0.9596
$\frac{\text{Net O/N financing}}{\text{Net term financing}}$	0.4025	0.5417	3.533	-0.6578	357	0.8192
ΔNet O/N financing	415.5	22181	83959	-77300	357	-0.3387
ΔNet term financing	-693.4	18368	55866	-74085	357	-0.2959
$\Delta\frac{\text{Net O/N financing}}{\text{Net term financing}}$	-0.0013	0.3255	1.366	-2.401	357	-0.3582

Repo Excess Returns

- Following Longstaff (2000), and using common terminology, I construct excess return series for repo rates:

$$rx_t^{(n)} = r_t^{(n)} - \left(\frac{1}{n}\right) \sum_{t=0}^{n} r_t^1$$

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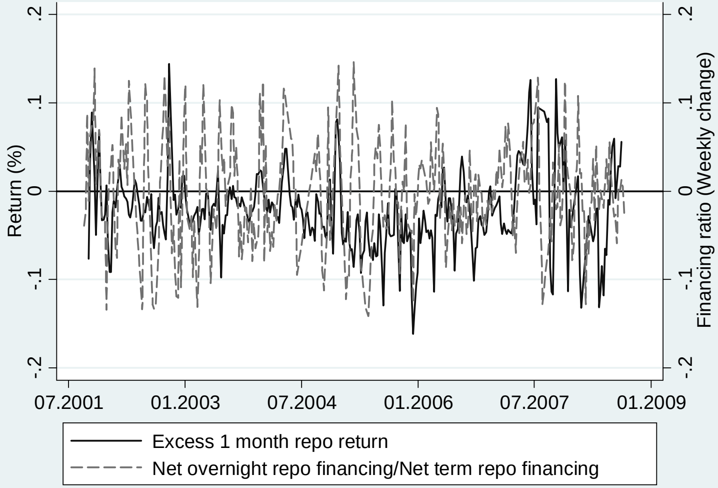
- Another data series used in my empirical analysis is the slope of the repo market term-structure: $r_t^{(n)} - r_t^1$

Summary statistics of GC Treasury excess returns and term structure slopes. Sample period: (11.07.2001 - 15.09.2008)

	Mean	**Std.Dev**	**Max**	**Min**	**N**	ρ
Excess returns						
rx^{1week}	0.0069	0.1520	1.2160	-0.9532	357	0.1636
rx^{2week}	0.0075	0.1776	1.1972	-1.0342	357	0.4735
rx^{3week}	0.0108	0.1850	1.2768	-0.9249	357	0.6601
rx^{1month}	0.0202	0.1878	1.2355	-0.7411	357	0.7727
Term structure slopes						
$r^{1week} - r^{o/n}$	0.0030	0.1065	1.1300	-0.5000	357	0.2325
$r^{2week} - r^{o/n}$	-0.0011	0.1218	1.1300	-0.5200	357	0.3545
$r^{3week} - r^{o/n}$	-0.0030	0.1381	1.2140	-0.4400	357	0.3967
$r^{1month} - r^{o/n}$	0.0016	0.1474	1.1900	-0.5360	357	0.4522

Dynamics of repo 1-month excess returns and ratio of Net overnight to Net term primary bond dealers' repo financing



Source: Bloomberg, New York Fed

Testable hypothesis

- A growth of $\Delta \frac{\text{Net O/N financing}}{\text{Net term financing}}$ occurs when primary dealers establish relatively more short positions for the overnight horizon, which results in that the overnight segment of the repo market becomes more "special" than the term segment. This can be expected to press down the overnight repo rate in relation to the term repo rate and, thus, positively impact repo market excess returns

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2. Growth in the ratio of primary bond dealers' overnight repo financing in relation to their term repo financing $\Delta \frac{\text{Net O/N financing}}{\text{Net term financing}}$ is positively associated with an increase in the slope of the repo market term-structure $r_t^{(n)} - r_t^1$

Empirical spesification

- Similarly to specifications used by Piazzesi and Swanson (2008) for the fed funds futures market and by Greenwood and Vayanos (2010) for the bond market I run:

$$\begin{aligned} rx_t^{(n)} &= \alpha + \beta X_t + \gamma Z_t + u_{t+n} \\ r_t^{(n)} - r_t^1 &= \alpha + \beta X_t + \gamma Z_t + u_t \end{aligned}$$

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  2. Price change of the nearby fed funds futures contract
  3. Merill Lynch MOVE Bond volatility index
  4. A measure of primary dealers' overbidding during Fed open market operations (OMO) $\frac{OMO\ O/N\ overbid}{OMO\ Term\ overbid}$

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- Merill Lynch MOVE Bond volatility index is analogous to the CBOE stock market volatility index (VIX)
- Fed organizes open market operations as discriminatory (pay-your-bid) auctions among primary bond dealers where dealers overbid. Nyborg and Strebulaev (2004) model of discriminatory auctions predicts that short squeezes may occur in the post-auctions secondary market.

Repo excess returns and maturity of dealers' financing

$$rx_{t+n}^{(n)} = \alpha + \beta X_t + \gamma Z_t + u_{t+n}$$

X_t is the growth of ratio of dealers' net financing in the overnight repo segment relative to the term repo segment $\Delta \frac{\text{Net O/N financing}}{\text{Net term financing}}$

	No crisis sample (July 2001 - August 2007)			
	rx^{1week}	rx^{2week}	rx^{3week}	rx^{1month}
$\Delta \frac{O/N\ Financing}{Term\ Financing}$	0.012 (0.016)	0.045** (0.021)	0.094*** (0.029)	0.100*** (0.027)
CP factor	0.171 (0.152)	0.312 (0.214)	0.282 (0.246)	0.244 (0.223)
Δ*FF Futures*	-0.675*** (0.175)	-0.810*** (0.271)	-0.707*** (0.224)	-0.514*** (0.150)
Δ*MOVE Vol*	-0.062 (0.104)	0.035 (0.119)	-0.083 (0.126)	0.199* (0.119)
$\frac{OMO\ O/N\ overbid}{OMO\ Term\ overbid}$	0.001 (0.003)	0.002 (0.004)	0.005 (0.005)	0.005 (0.004)
Num.obs.	305	305	305	305
R^2	0.081	0.084	0.104	0.107

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The whole sample (July 2001 - Sept. 2008)				
	rx^{1week}	rx^{2week}	rx^{3week}	rx^{1month}
$\Delta \frac{O/N\ Financing}{Term\ Financing}$	0.006 (0.020)	0.045** (0.023)	0.135*** (0.056)	0.129*** (0.044)
CP factor	0.255 (0.208)	0.256 (0.232)	0.604* (0.368)	0.559* (0.338)
Δ*FF Futures*	-0.271 (0.289)	-0.101 (0.381)	-0.358 (0.503)	-0.451 (0.330)
Δ*MOVE Vol*	-0.216 (0.161)	-0.045 (0.194)	0.175 (0.210)	0.295 (0.205)
$\frac{OMO\ O/N\ overbid}{OMO\ Term\ overbid}$	0.002 (0.003)	0.001 (0.004)	0.006 (0.006)	0.006 (0.005)
Num.obs.	357	356	353	349
R^2	0.021	0.011	0.046	0.048

Term-structure slope and maturity of dealers' financing

$$r_t^{(n)} - r_t^1 = \alpha + \beta X_t + \gamma Z_t + u_t$$

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	The whole sample (July 2001 - Sept. 2008)			
	$Slope^{1week}$	$Slope^{2week}$	$Slope^{3week}$	$Slope^{1month}$
$\Delta \frac{O/N\ Financing}{Term\ Financing}$	0.001 (0.014)	0.008 (0.029)	0.059 (0.037)	0.050 (0.061)
CP factor	0.058 (0.161)	0.372 (0.249)	0.657 (0.257)	0.807* (0.469)
$\Delta FF\ Futures$	-0.191 (0.254)	0.074 (0.351)	0.324 (0.269)	0.930* (0.495)
$\Delta MOVE\ Vol$	-0.299*** (0.115)	-0.445*** (0.179)	-0.397** (0.215)	-0.642*** (0.262)
$\frac{OMO\ O/N\ overbid}{OMO\ Term\ overbid}$	0.001 (0.002)	0.005 (0.004)	0.012** (0.005)	0.016** (0.007)
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- I construct a factor measuring primary dealers’ net financing in the overnight repo segment relative to the term repo segment and demonstrate that this variable is significantly associated with repo market excess returns in the whole 2001-2008 period