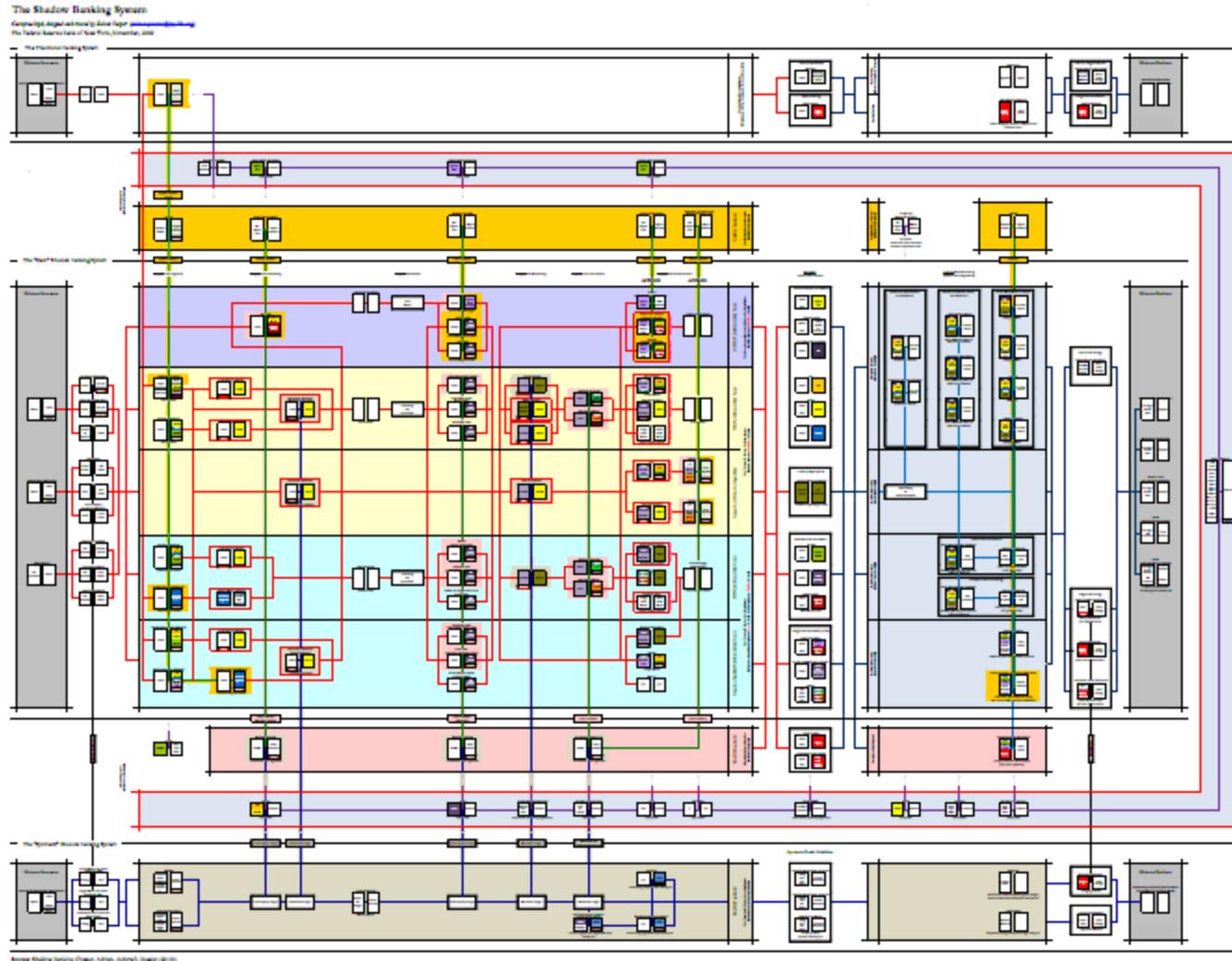


Shadow Banking, Central Banking, and the Future of Global Finance

Perry Mehrling

Dec 5, 2012

What is a Bank?



1. Shadow Banking as Market-based Credit

Securitization

Shadow Bank

MMMF

Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
RMBS	Hi tranche Mid tranche Lo tranche	Hi tranche	RP	RP	“deposits”

Traditional Bank

FRB backstop



Assets	Liabilities
Loans Reserves	Deposits Capital

FDIC backstop



Immature Liquidity Backstop

Securitization

Shadow Bank

MMMF

Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
RMBS	Hi tranche Mid tranche Lo tranche	Hi tranche Liquidity put	RP	RP Liquidity put	“deposits”

Traditional Bank

FRB backstop



Assets	Liabilities
Loans Reserves	Deposits Capital Liquidity put

FDIC backstop



Immature Solvency Backstop

CDO

Invest. Bank

Insurance

Assets	Liabilities	A	L	A	L
RMBS	Hi Tranche Mid Tranche Lo Tranche	Hi CDS	Mid CDS Lo CDS		Hi CDS Capital

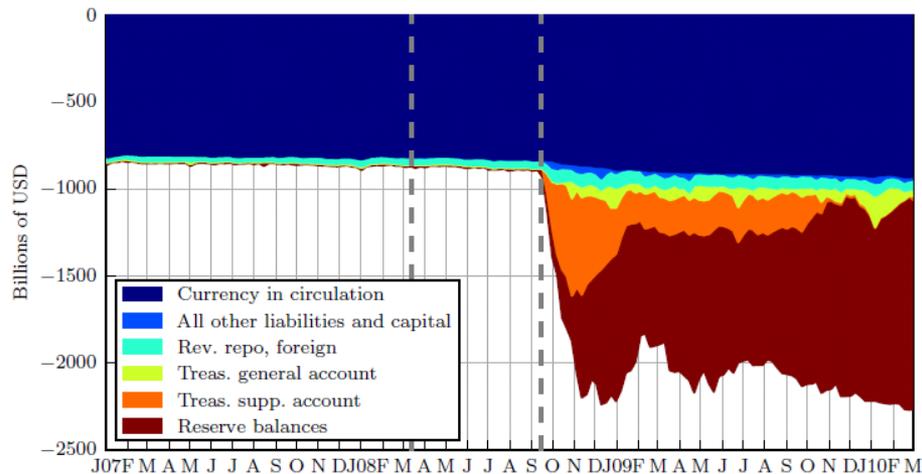
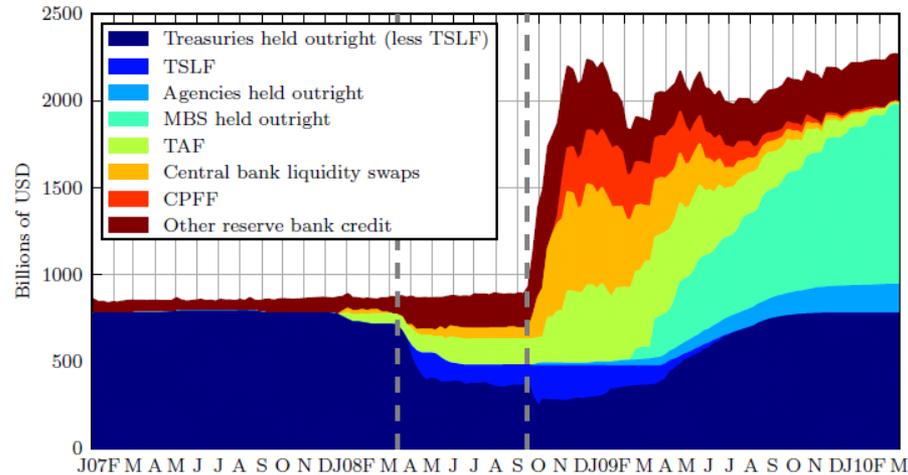
Shadow Bank

Pension/Insurance

Hedge Fund

Assets	Liabilities	A	L	A	L
Hi Tranche Hi CDS	MM Funding	Mid Tranche Mid CDS	DB/Annuity Capital	Lo Tranche Lo CDS	Loans Capital

Fed as Dealer of Last Resort



2. Shadow Banking as....

Global Banking

Korean Bank

Global Bank

Dollar Bank

Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
Domestic currency loans FX swaps \$ reserves	Dollar funding	Dollar lending	Wholesale money market	Wholesale money market	“deposits”

RMBS

Shadow Bank

MMMF

Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
Mortgage loans	Hi tranche Mid tranche Lo tranche	Hi tranche	ABCP	ABCP	“deposits”

From Domestic to International LOLR

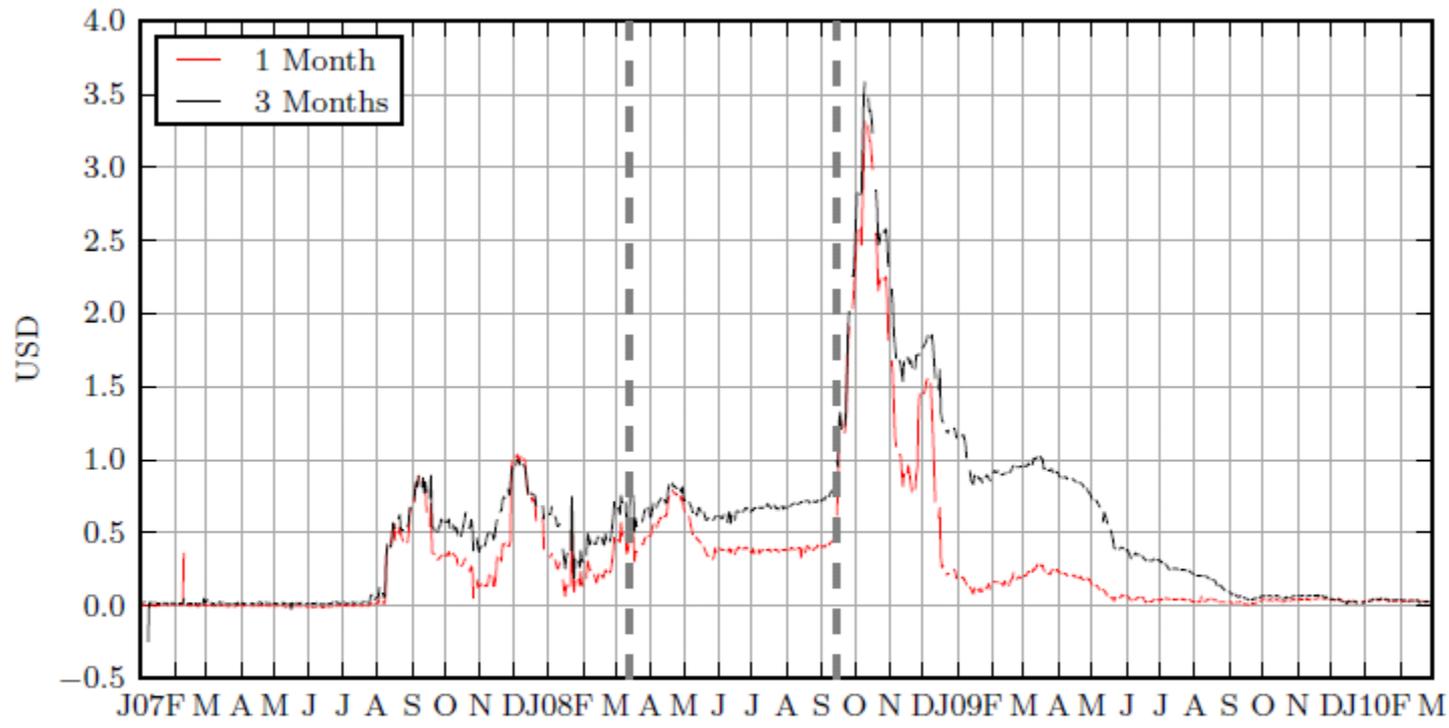


Figure 6: USD OIS-LIBOR spread, 1 and 3 months.

3. Shadow Banking as

Modern Finance

- Modern Asset Management
 - **Financial Globalization** and Securitization
 - **Capital Markets** and Money/Derivatives Markets

Shadow Bank

Asset Manager

Assets	Liabilities	Assets	Liabilities
RMBS Derivatives	Money	Money	Capital Derivatives

What is shadow banking?

“Money market **funding**
of
Capital market **lending**”

- **Global** funding of **local** lending
- **Market pricing**, both money and capital
- Key role of **market-making** institutions

Other definitions

- Received views...
 - Gorton and Metrick (2011) “Regulating the Shadow Banking System”; Adrian and Ashcraft (Oct 2012) “Shadow Banking: A Review of the Literature”; FSB (Nov 2012) “Strengthening Oversight and Regulation of Shadow Banking”
- Emphasize “shadow” versus “traditional” banking
 - Bank vs. non-bank
 - Regulated vs. non-regulated (evasion)
 - Direct government backstop vs. indirect (unauthorized)
- Versus our emphasis on banking evolution
 - Financial **globalization**: dollar funding, reserve currency holding
 - Cf. Shin (2011) “Global Banking Glut and Loan Risk Premium”
 - Financial **revolution**: derivatives, risk pricing markets
- Imagine a world of ONLY shadow banking

“Making” Markets, Money and Risk

Capital Funding Bank **Global Money Dealer** Asset Manager

Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
RMBS CDS IRS FXS	MM funding	MM funding	“deposits”	“deposits”	Capital CDS IRS FXS

Derivative Dealer

Assets	Liabilities
Credit Default Swaps Interest Rate Swaps FX Swaps	Credit Default Swaps Interest Rate Swaps FX Swaps

Idealization

- We **abstract from...**
 - Retail depositors, security investors, traditional banks
 - Securitization process (underwriting, legal basis)
 - Liquidity reserves (Tbills and cash)
 - Capital reserves (Haircuts)
 - Proprietary dealing (price risk, “leverage”)
- In order to **focus on....**
 - System interlinkages and system behavior
 - Normal liquidity risk, not tail solvency risk
 - Tail liquidity backstops, both funding liquidity (money) and market liquidity (capital)

Financial Stability Board (WS5)

- “Securities lending and repo markets play crucial roles in supporting **price discovery and secondary market liquidity** for a variety of securities issued by both public and private agents.”

Backstopping Market-making

- Global Bank (funding)
- Derivative Dealer (risk)
- **Central Bank (or C5)**

Assets	Liabilities
MM funding Liquidity put (funding)	“deposits”
Assets	Liabilities
CDS IRS FXS Liquidity put (market)	CDS IRS FXS
Assets	Liabilities
	Liquidity put (funding) Liquidity put (market)

Fed Balance Sheet Transformed

Dec 15, 2011

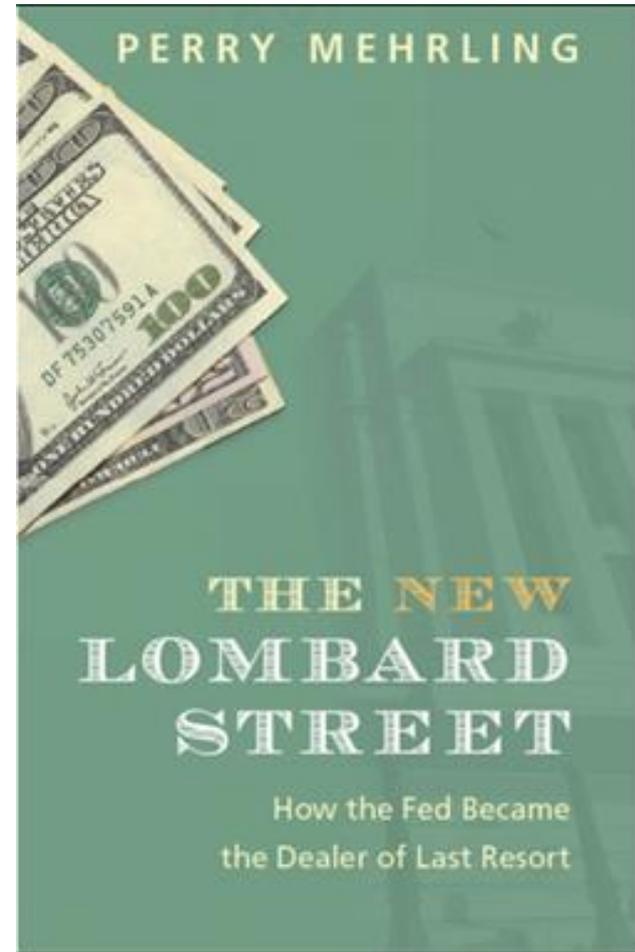
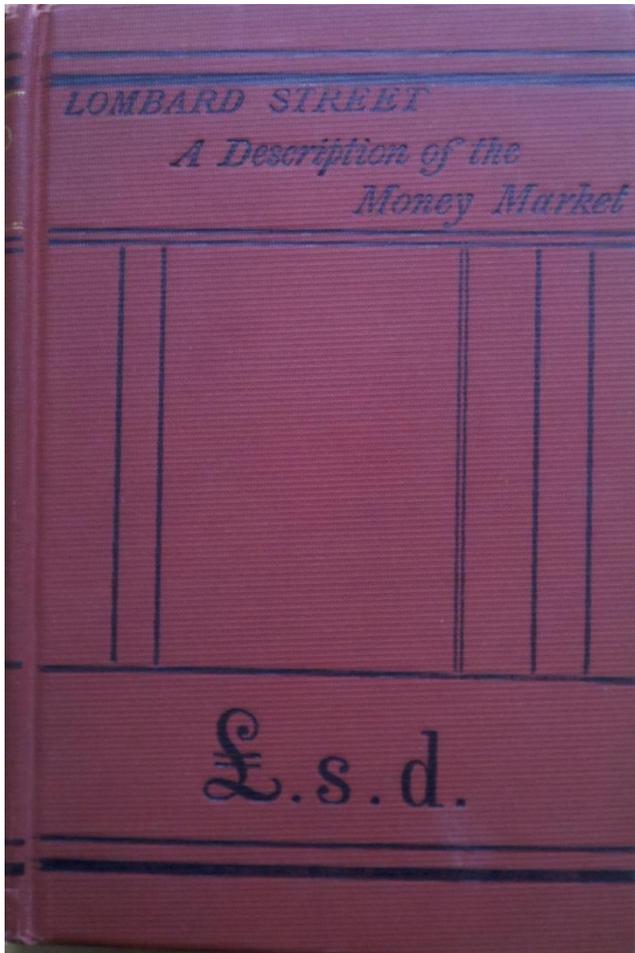
Dec 15, 2011 (restated)

Assets		Liabilities		Assets		Liabilities	
Treasuries	\$1.7	Currency	\$1.0	[TBill	\$2.6	Curr./Res.	\$2.6]
MBS/GSE	.9	Reserves	1.6	[Tbond	2.6	Tbill	2.6]
Other	.3	Other	.3	[Risky Secs	.9	Tbond	.9]
				Other	.3	Other	.3
TOTAL	2.9	TOTAL	2.9	TOTAL	6.4?	TOTAL	6.4?

- Fed as Dealer of Last Resort

- Global Money Dealer (OIS) [and FX swap]
- Global Derivative Dealer (IRS, CDS)

A Bagehot Moment



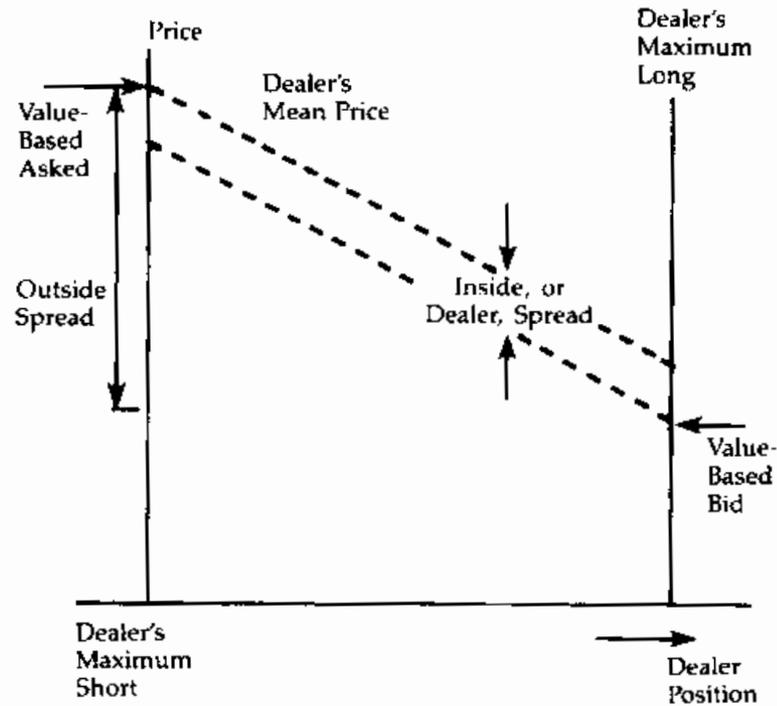
Regulation I: Systemic Risk

“Inherent Instability of Credit”

- Hawtrey (1919) Currency and Credit
- Minsky (1986) Stabilizing an Unstable Economy
- Adrian and Shin (2010) “Liquidity and Leverage”

Centrality of the Dealer Function

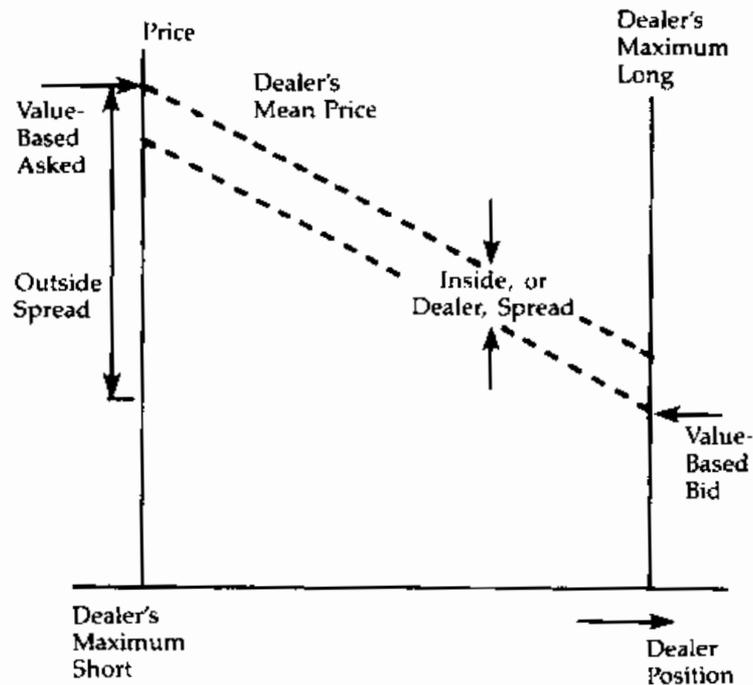
Figure A Dealer's Spread and Maximum Position



- Treynor, 1987

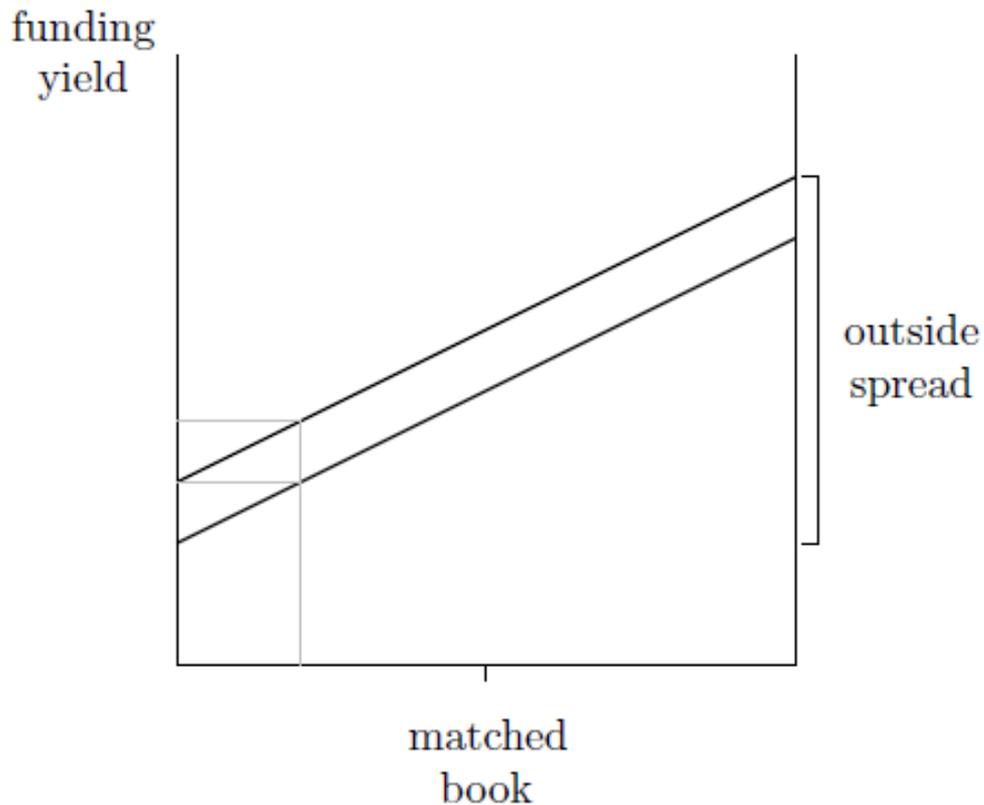
Funding Liquidity and Market Liquidity

Figure A Dealer's Spread and Maximum Position

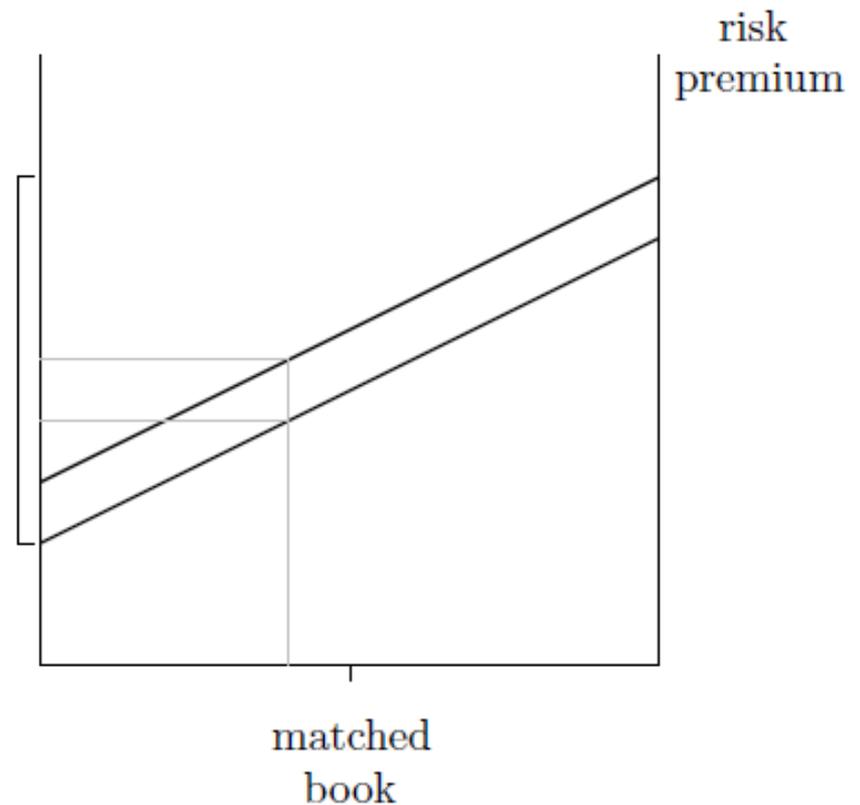


Boom Order Flow: Asset Manager > Capital Funding Bank

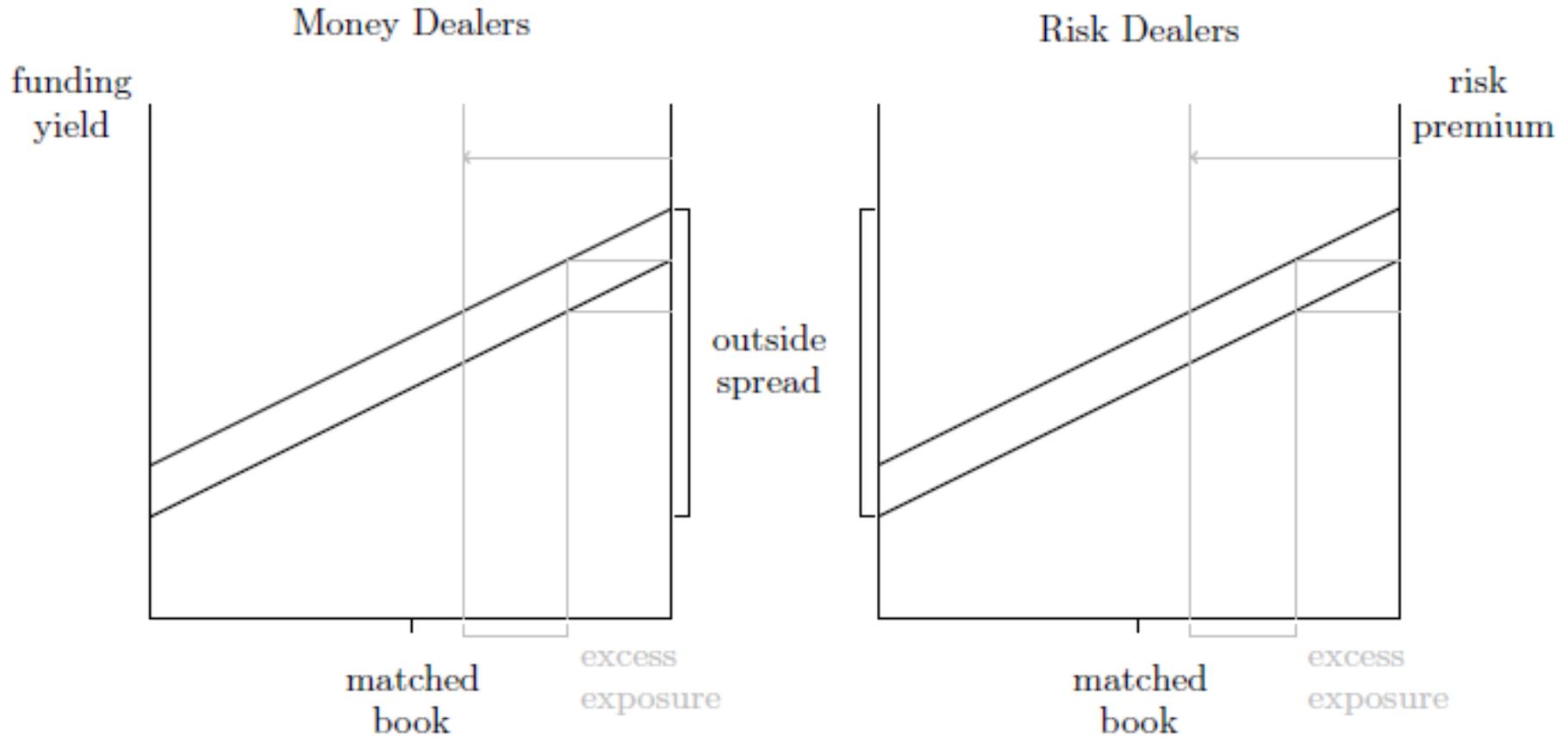
Money Dealers



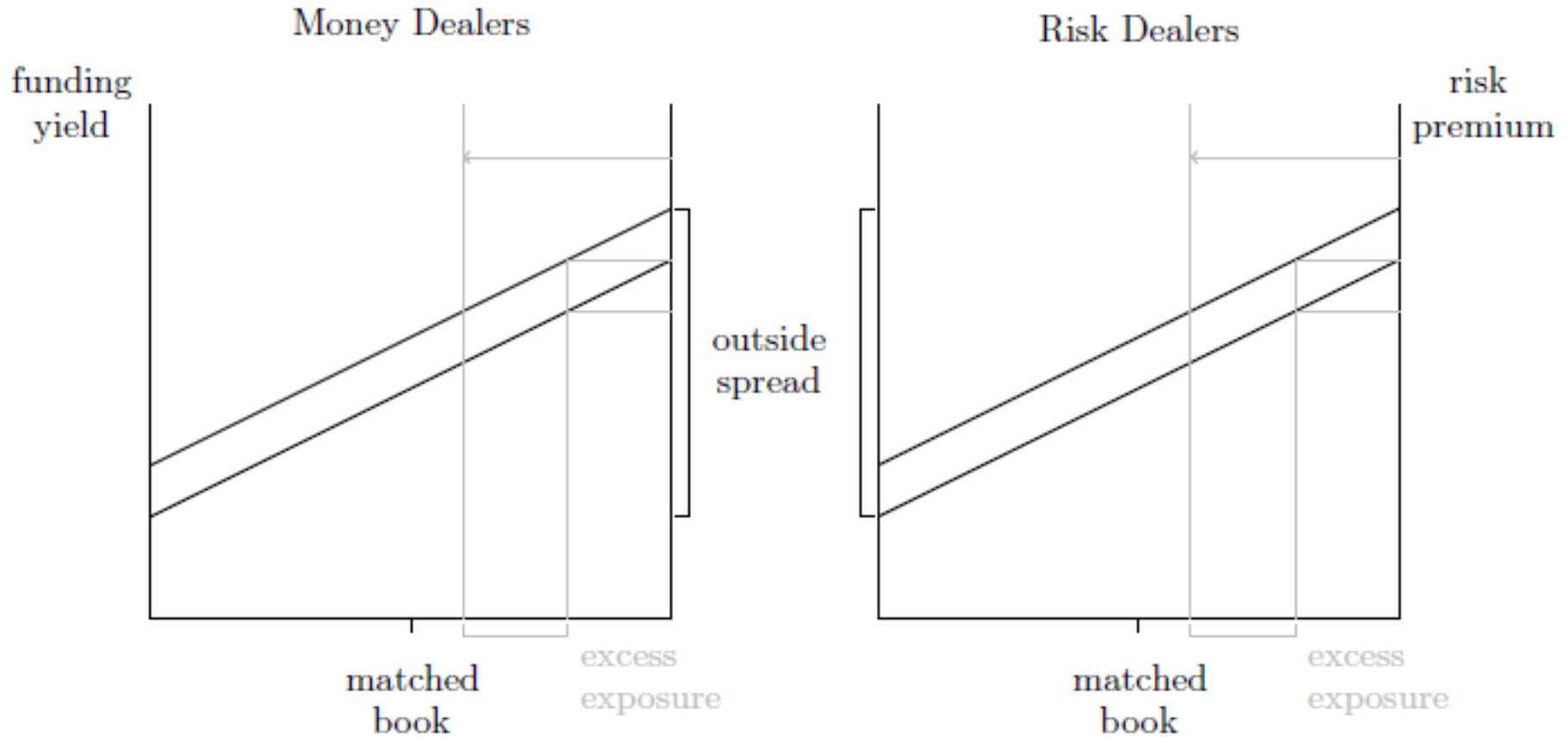
Risk Dealers



Bust Order Flow: Asset Manager < Capital Funding Bank



Bust Order Flow: Dealer Funding Stress



Fed Balance Sheet Transformed

Dec 15, 2011

Dec 15, 2011 (restated)

Assets		Liabilities		Assets		Liabilities	
Treasuries	\$1.7	Currency	\$1.0	[TBill	\$2.6	Curr./Res.	\$2.6]
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TOTAL	2.9	TOTAL	2.9	TOTAL	6.4?	TOTAL	6.4?

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- Global Money Dealer (OIS) [and FX swap]
- Global Derivative Dealer (IRS, CDS)

Regulation II: Plumbing Collateral and Payment Flows

- Aitken and Singh (2010) “The (sizable) role of rehypothecation in the shadow banking system.”
- Minsky, “survival constraint”, settlement in the payments system

Backstop for Normal Times?

CFB

GMD

AM

Assets		Liabilities		Assets		Liabilities		Assets		Liabilities	
RMBS	100	MM	100	MM	100	Deposit	100	Deposit	100	Capital	100
CDS	0									CDS	0
IRS	0									IRS	0

DD

Assets		Liabilities	
CDS	0	CDS	0
IRS	0	IRS	0

- Abstracting from Counterparty Risk
 - Lending (RMBS collateral as security)
 - Derivatives (Pre-funding and hedging)

Value Fluctuation and Collateral Flows

CFB

GMD

AM

Assets		Liabilities		Assets		Liabilities		Assets		Liabilities	
RMBS	90	MM	100	MM	100	Deposit	100	Deposit	100	Capital	90
CDS	10									CDS	10
IRS	0									IRS	0

DD

Assets		Liabilities	
CDS	10	CDS	10
IRS	0	IRS	0

- Blocking a liquidity spiral (firesale of RMBS, CDS)
 - Lender of Last Resort to GMD, DD
 - Dealer of Last Resort for RMBS, CDS

Value Fluctuation and Payment Flows

CFB

GMD

AM

Assets		Liabilities		Assets		Liabilities		Assets		Liabilities	
RMBS	90	MM	100	MM	100	Deposit	100	Deposit	100	Capital	90
CDS	10									CDS	10
IRS	0									IRS	0

DD

Assets		Liabilities	
CDS	10	CDS	10
IRS	0	IRS	0

- Blocking a liquidity spiral (firesale of RMBS, CDS)
 - Lender of Last Resort to GMD, DD
 - Dealer of Last Resort for RMBS, CDS

“Making” Markets, Money and Risk

Capital Funding Bank Global Money Dealer Asset Manager

Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
RMBS CDS IRS FXS	MM funding	MM funding Liquidity Reserves	“deposits” Capital Reserves	“deposits”	Capital CDS IRS FXS

Derivative Dealer

Assets	Liabilities
CDS IRS FXS Liquidity Reserves	CDS IRS FXS Capital Reserves

Liquidity vs. Solvency

- Key players in market-based credit system are **dealers**, not shadow banks per se
- Key backstop for matched book dealers is **liquidity**, not capital
- Key backstop for speculative dealers is **capital**, not liquidity
- Survival constraint is about **collateral flows**, not just payment flows