

Policy Analysis Using the Bank of Finland PSS 2.0.0

The Effects of Eliminating the Provision of Intraday Credit for Government Sponsored Enterprises

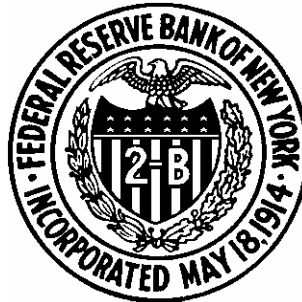
Morten L. Bech and Kurt Johnson

Payment Studies Function

Federal Reserve Bank of New York

August 25, 2005

The views expressed are those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System.



Question!

What do you have to possess to conduct a proper policy analysis with the BoF-PSS2?



A funky, “simulator blue” front page

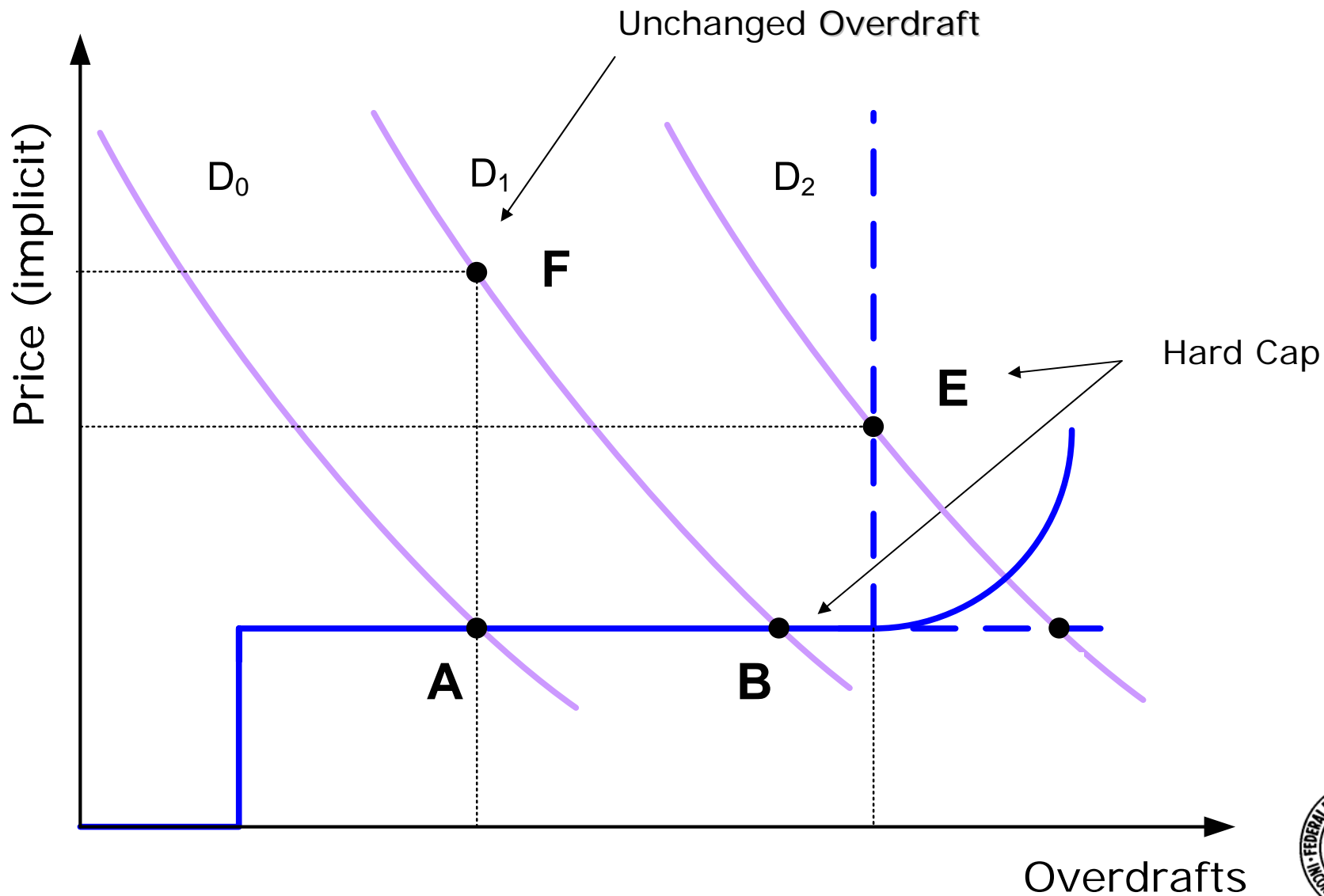


New Payments System Risk Policy

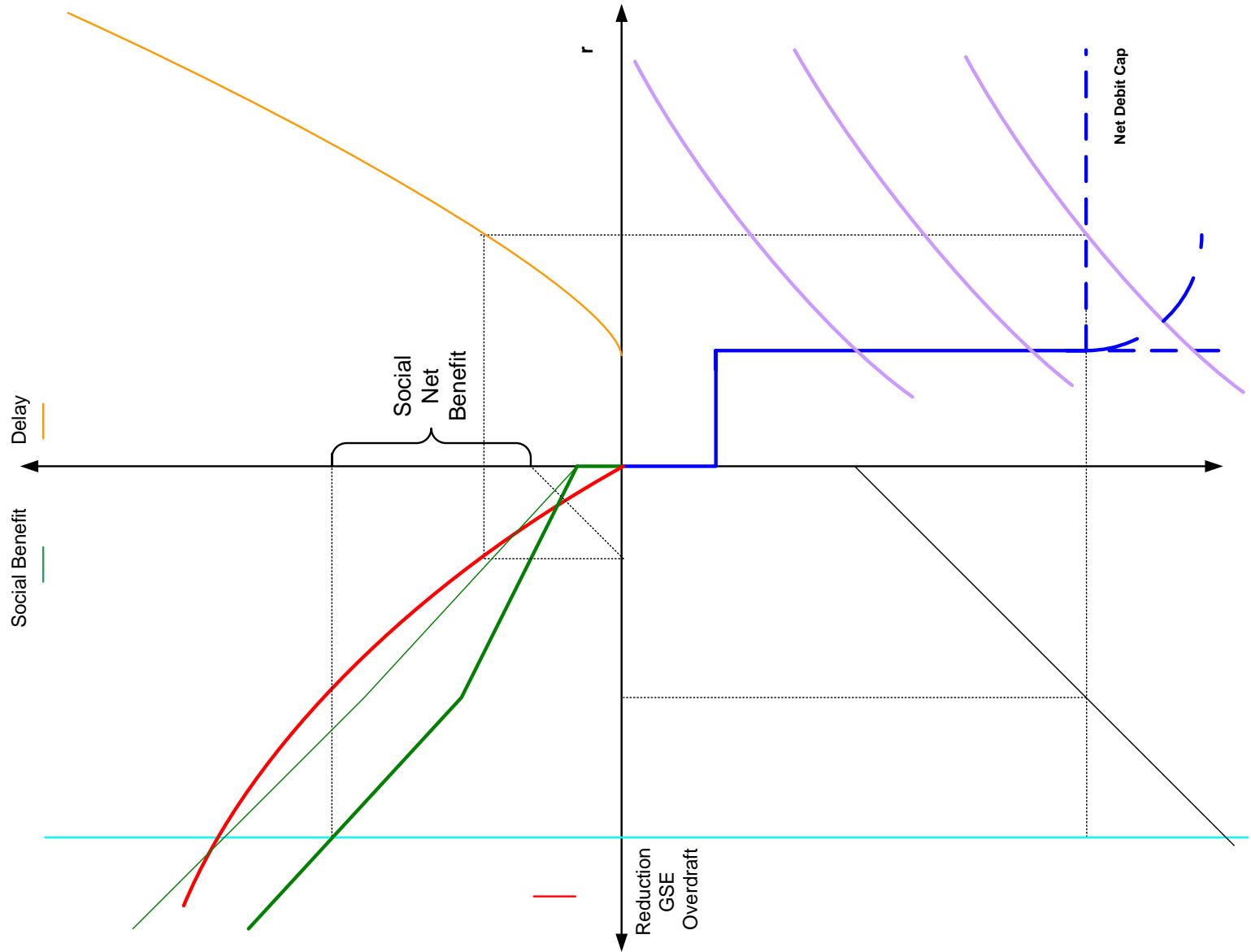
- Current Policy: Government-Sponsored Enterprises (GSEs) granted free and uncapped intraday credit payment of principal and interest (P&I).
- GSEs are privately-owned (some listed on NYSE).
- Issues:
 - ▲ Subsidy relative to other participants
 - ▲ May add to the presumption of an implicit government guarantee
 - ▲ Potential access to the discount window, similar to a DI
- “neither necessary to achieve the Federal Reserve’s statutory mission nor appropriate risk management policy for the central bank”
- New Policy: Beginning July 2006, P&I payments will be released as directed by the issuer provided the issuer's account contains sufficient funds to cover them. Cutoff time at 4pm ET



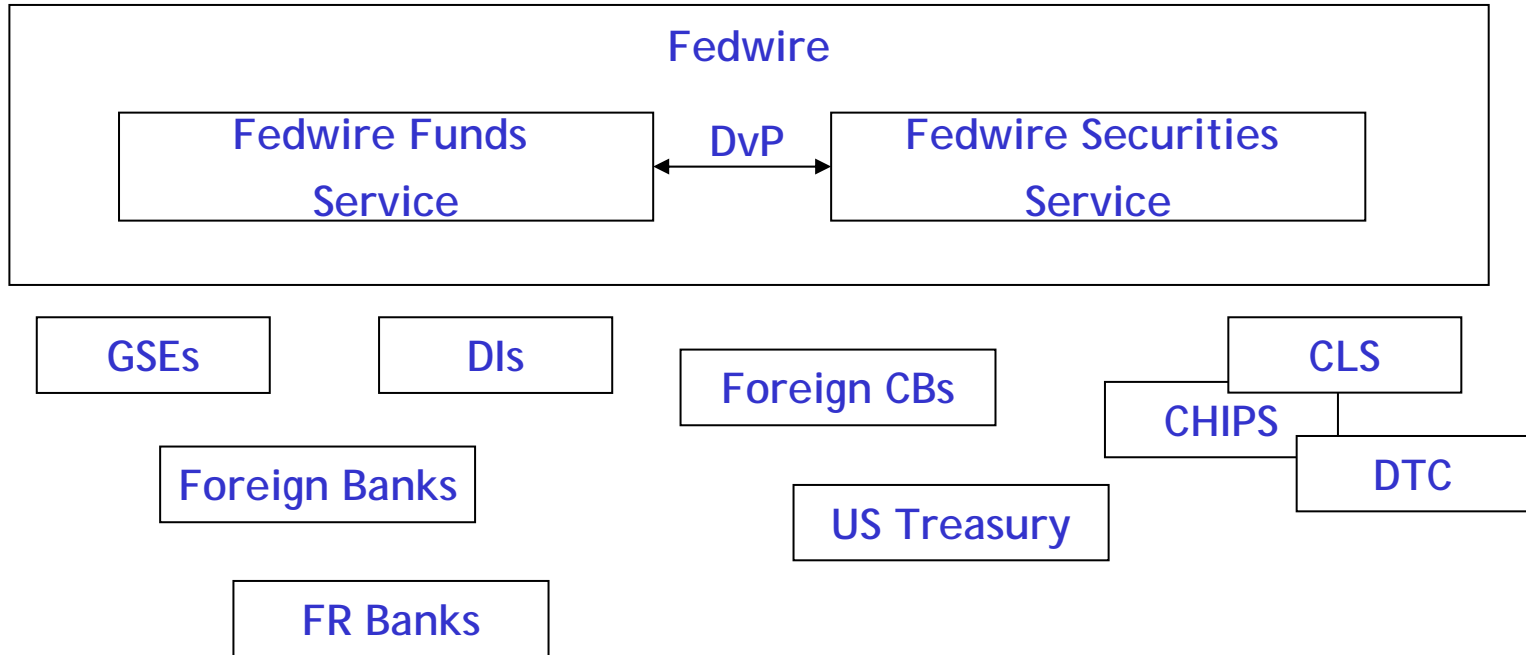
Supply and Demand for Overdrafts



Economic Model



Fedwire



Players	Value Market Share	Volume Market Share	Average Overdraft
DIs	84%	91%	\$28 bn
GSEs	5%	2%	\$17 bn
Foreign Banks	11%	7%	\$6.6 bn



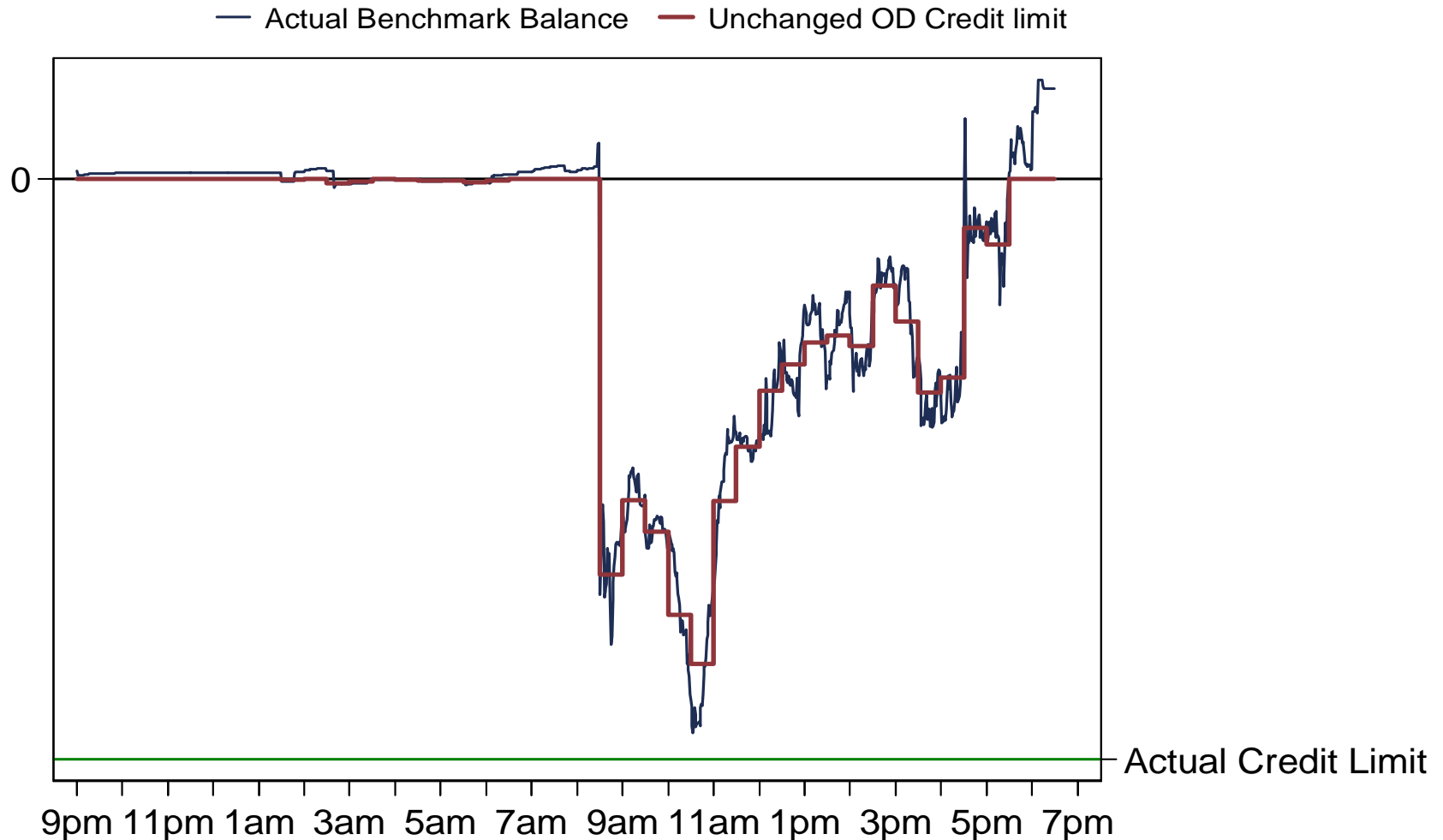
Key Aspects of Simulator Setup

- One day with high GSE P&I activity
- Simply put: GSEs had credit, now they don't
- DvP included with simulator link codes
- RTGS with Bypass FIFO queues
 - ▲ Simulate internal queues maintained by participants
 - Entry order imperfectly reflects payment preference
 - Entry order depends on payment arrival
 - Participants operate efficiently
- Payments ↔ ancillary systems immediately settle
 - ▲ Applied Entry for Urgent algorithm (ENFORURG)
- End of day: Forced Gross settlement



Actual vs. Unchanged OD Credit Limits

Generic Bank



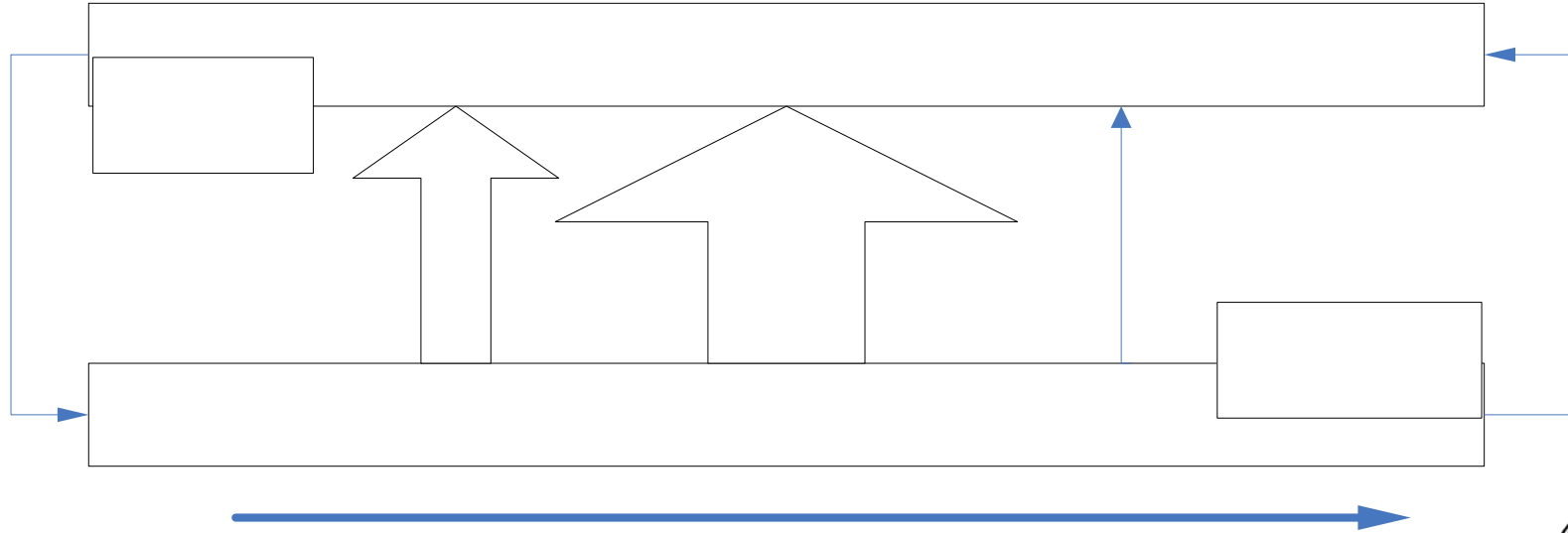
Money Market Funding Strategy

- GSE money market loans are traditionally returned after 16:00
 - ▲ Current Funding Strategy: GSEs receive loan returns as usual - after 16:00
 - ▲ New Funding Strategy: GSEs receive early loan returns at 10:00



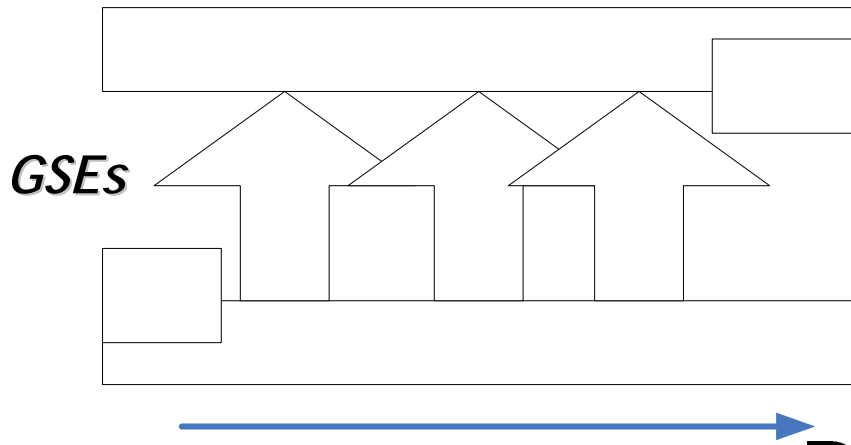
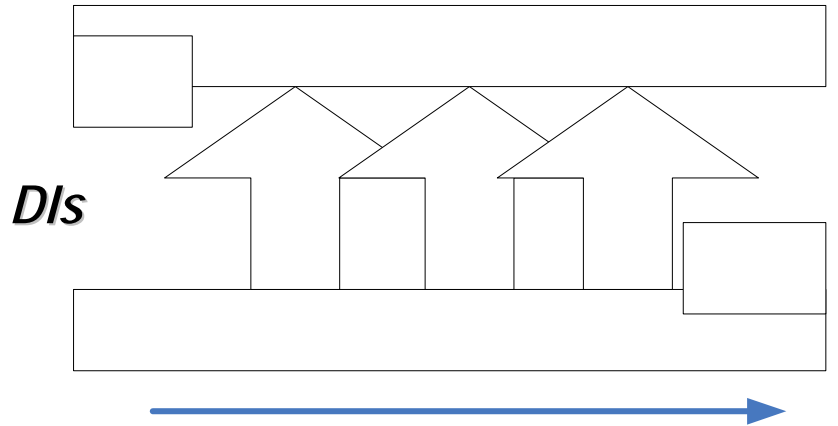
Simulation Description Diagram

- Inflow and outflow blocks represent knowledge of when payments are traditionally sent and received - an expected entry order per se
- Smaller blocks outside represent specific sets of payments and their anticipated arrival or expected departure
- Credit limit arrows are proportioned according to size of allowable outflow when below zero balance



Benchmark Scenario

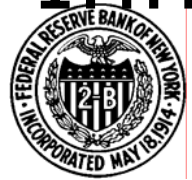
Every bank is allotted its actual credit limit



P&I

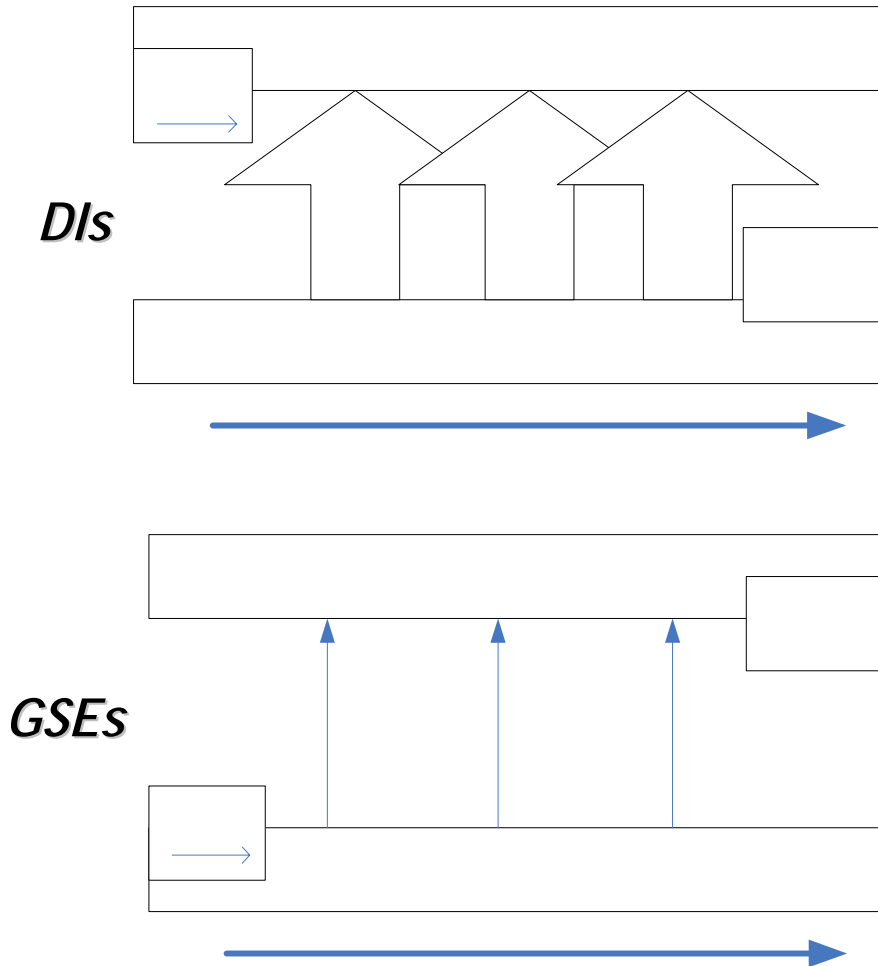
Depository Institutions	Benchmark
Overdraft	<u>Billions</u>
Average	\$34.8
Large DIs	\$16.7
Other DIs	\$11.5
Foreign Banks	\$6.6
Peak	\$104.2
@ 10:30am	\$72.5
Max Diff. to Benchmark	-
Time of Peak (ET)	3:49 PM
P&I remaining @ 4pm	<u>Billions</u> n.a.
Avg. Time of Settlement	<u>Eastern Time</u>
All	1:15 PM
Funds	2:47 PM
Securities	11:04 AM
P&I	8:30 AM
Delay Statistic	<u>Index [0;1]</u>
All	0.00
Funds	0.00
Securities	0.00
P&I	0.00

Expected Inflow



Current Funding Hard Caps Scenario

Costless intermediation up to each DI's cap, then no more credit



Depository Institutions	Benchmark	Hard Cap Current Funding Strategy
Overdraft		<u>Billions</u>
Average	\$34.8	\$42.9
Large DIs	\$16.7	\$23.1
Other DIs	\$11.5	\$13.2
Foreign Banks	\$6.6	\$6.6
Peak	\$104.2	\$123.3
@ 10:30am	\$72.5	\$94.5
Max Diff. to Benchmark	-	\$33.6
Time of Peak (ET)	3:49 PM	3:49 PM
P&I remaining @ 4pm	n.a.	\$17.8
Avg. Time of Settlement		<u>Eastern Time</u>
All	1:15 PM	1:21 PM
Funds	2:47 PM	2:48 PM
Securities	11:04 AM	11:04 AM
P&I	8:30 AM	2:08 PM
Delay Statistic		<u>Index [0:1]</u>
All	0.00	0.01
Funds	0.00	0.00
Securities	0.00	0.00
P&I	0.00	0.56

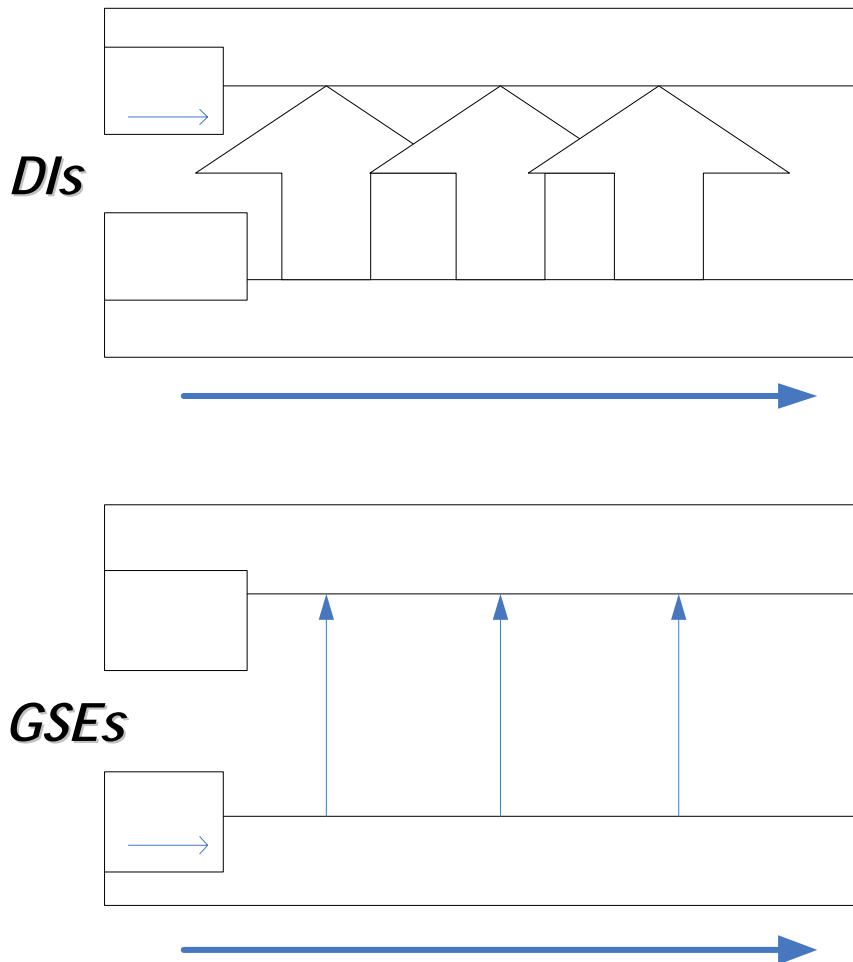
Expected I

P&I



New Funding Hard Caps Scenario

Costless intermediation up to each DI's cap, then no more credit



Depository Institutions	Hard Cap	
	Current Funding Strategy	New Funding Strategy
Overdraft	<u>Billions</u>	
Average	\$42.9	\$42.8
Large DIs	\$23.1	\$21.2
Other DIs	\$13.2	\$13.9
Foreign Banks	\$6.6	\$7.7
Peak	\$123.3	\$125.2
@ 10:30am	\$94.5	\$100.5
Max Diff. to Benchmark	\$33.6	\$40.5
Time of Peak (ET)	3:49 PM	3:49 PM
P&I remaining @ 4pm	<u>Billions</u>	
	\$17.8	\$0.0
Avg. Time of Settlement	<u>Eastern Time</u>	
All	1:21 PM	1:15 PM
Funds	2:48 PM	2:47 PM
Securities	11:04 AM	11:04 AM
P&I	2:08 PM	11:13 AM
Delay Statistic	<u>Index [0:1]</u>	
All	0.01	0.01
Funds	0.00	0.00
Securities	0.00	0.00
P&I	0.5	0.2

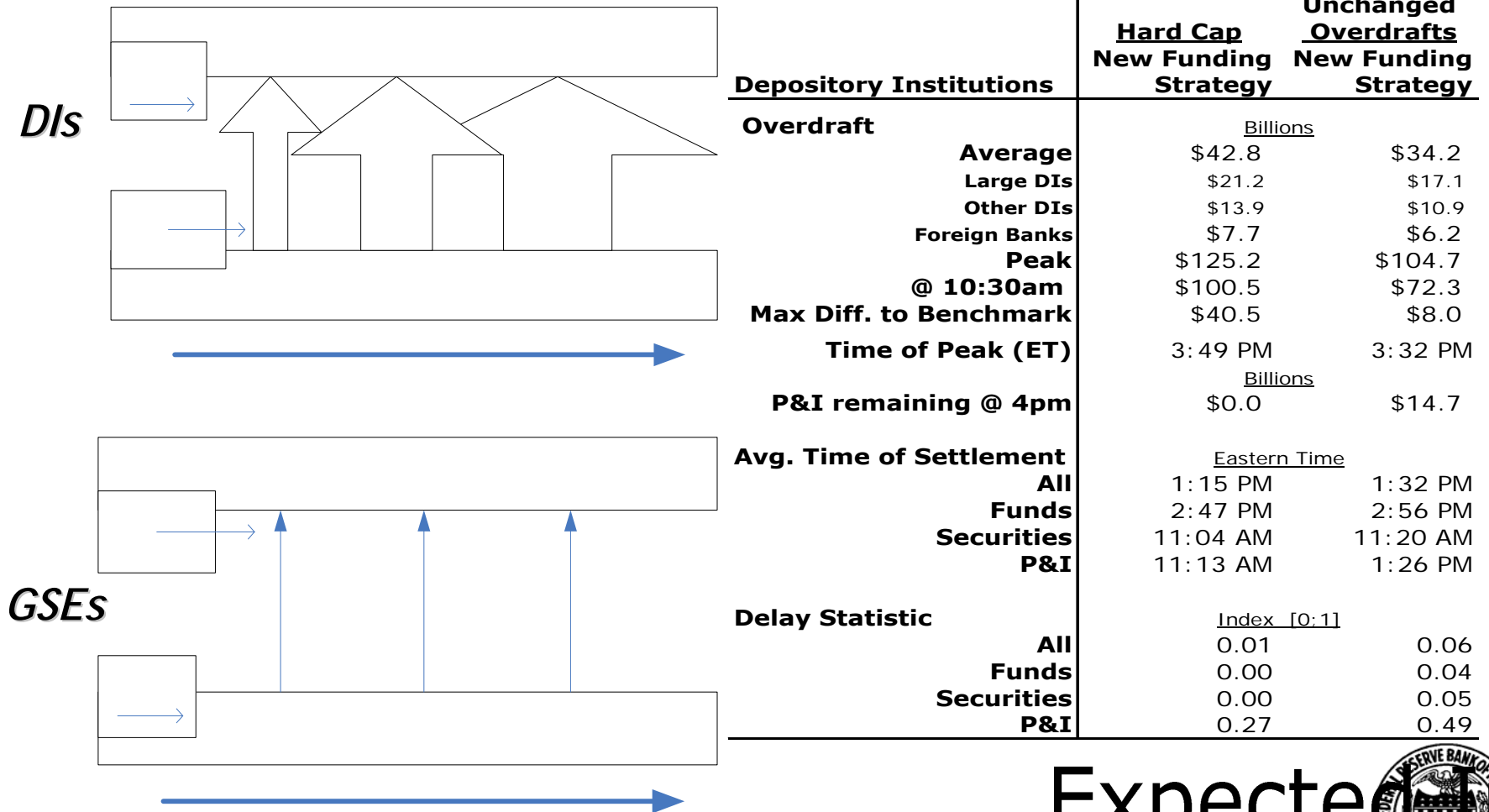
Expected Inflow

P&I



New Funding Unchanged OD Scenario

Costly Intermediation where banks face information costs in lending intraday

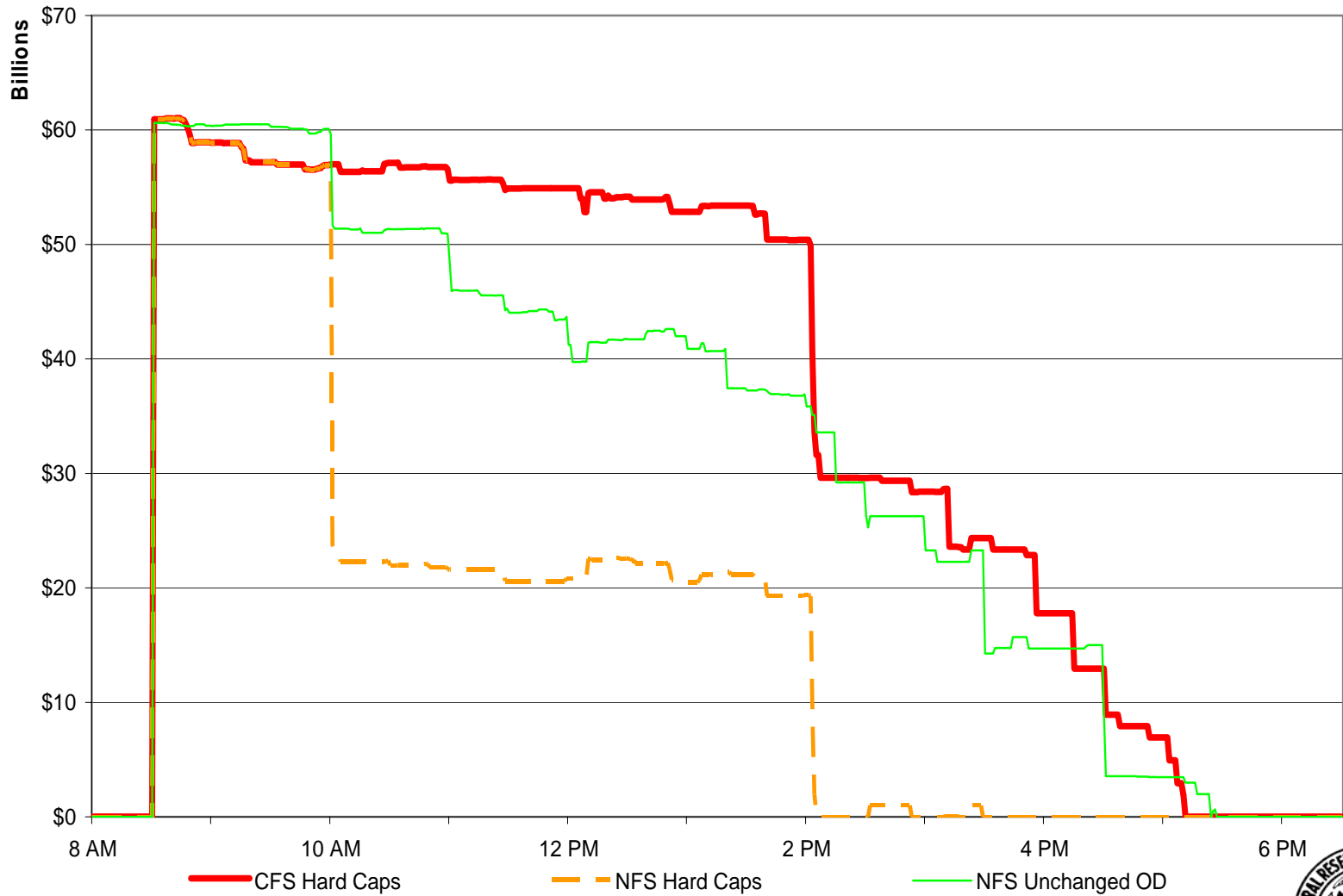


Expected

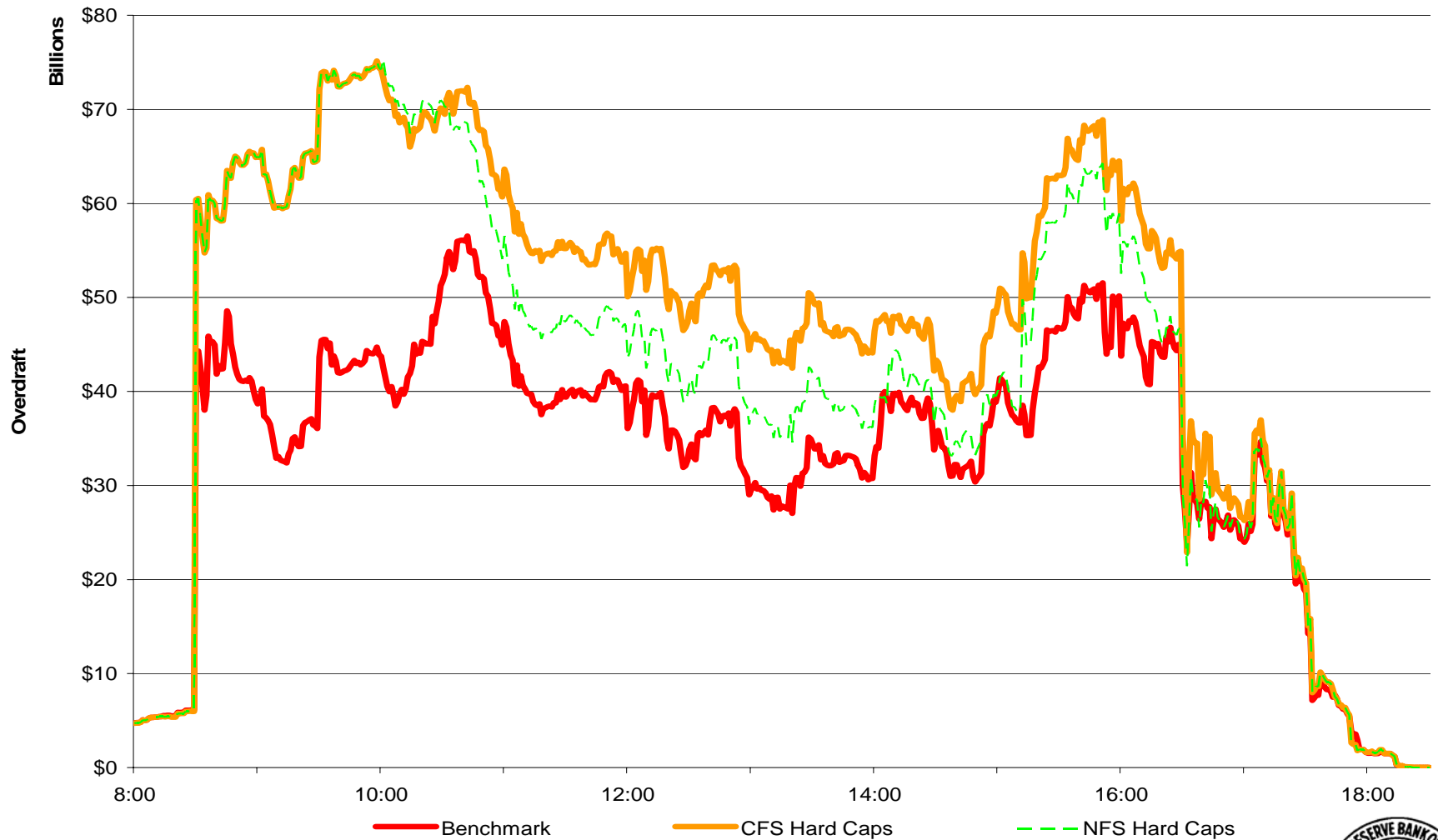


P&I

GSEs Total P&I Queued



Select Large DIs Total Overdraft



Winners/Losers - Measurements

- Must automate a way to filter through over 60,000 accounts
- Average Overdrafts and resultant Overdraft Fees
- Peak Overdrafts, Time of Peak, Duration of Peak
 - ▲ Earlier peaks and shorter duration are preferred (i.e. win)
- Average amount of securities par and cash in queue
- Total forced end-of-day settlement amounts: securities par and cash
- Delay statistic, weighted and un-weighted average time of settlement, plus median time of settlement
 - ▲ Each done from both the sender and receiver side
 - ▲ Earlier times are preferred (i.e. win)



Winners

Scenario			<u>Absolute</u> NFS Hard Caps vs. NFS Unchanged OD		
Rank	Name	ABA Number	Δ Peak OD	Δ Avg. Cash Queued	Δ Sender's Delay Stat
			<u>Millions</u>		<u>%</u>
1	Bank X	#####	-\$8,022.9	-\$325.2	-18.3
2	Bank X	#####	-\$2,290.7	-\$275.7	-15.8
3	Bank X	#####	-\$2,152.5	-\$240.6	-6.0
4	Bank X	#####	-\$1,880.0	-\$4.6	-0.9
5	Bank X	#####	-\$1,861.9	-\$0.6	-0.5
6	Bank X	#####	-\$1,768.3	-\$0.5	-0.3
7	Bank X	#####	-\$1,706.2	-\$0.3	-0.2
8	Bank X	#####	-\$1,627.5	-\$0.1	0.0
9	Bank X	#####	-\$1,352.8	\$0.0	0.0
10	Bank X	#####	-\$1,325.6	\$0.0	0.0

Note: Bank X does not remain constant from column to column

- Δ Statistic = CFS Hard Caps – Benchmark
- Δ Statistic = NFS Unchanged OD – CFS Average OD



Losers

Scenario			Absolute		Relative	
			NFS Hard Caps vs. NFS Unchanged OD		CFS Hard Caps vs. Benchmark	
Rank	Name	ABA Number	Δ Peak OD	Δ Avg. Cash Queued	Δ Sender's Delay Stat	Δ Peak OD/Cap
			Millions		%	%
1	Bank X	#####	\$2,397.1	\$2,792.4	56.1	97.0
2	Bank X	#####	\$1,089.1	\$1,744.4	54.0	66.7
3	Bank X	#####	\$571.8	\$1,101.4	34.7	65.0
4	Bank X	#####	\$285.4	\$899.4	29.3	62.9
5	Bank X	#####	\$122.7	\$791.5	28.4	46.5
6	Bank X	#####	\$98.7	\$592.0	25.4	38.6
7	Bank X	#####	\$88.9	\$534.8	20.0	38.4
8	Bank X	#####	\$86.0	\$473.3	17.5	30.7
9	Bank X	#####	\$46.1	\$387.2	16.2	29.2
10	Bank X	#####	\$9.6	\$380.2	16.2	27.7

Note: Bank X does not remain constant from column to column

- Δ Statistic = CFS Hard Caps – Benchmark
- Δ Statistic = NFS Unchanged OD – CFS Average OD

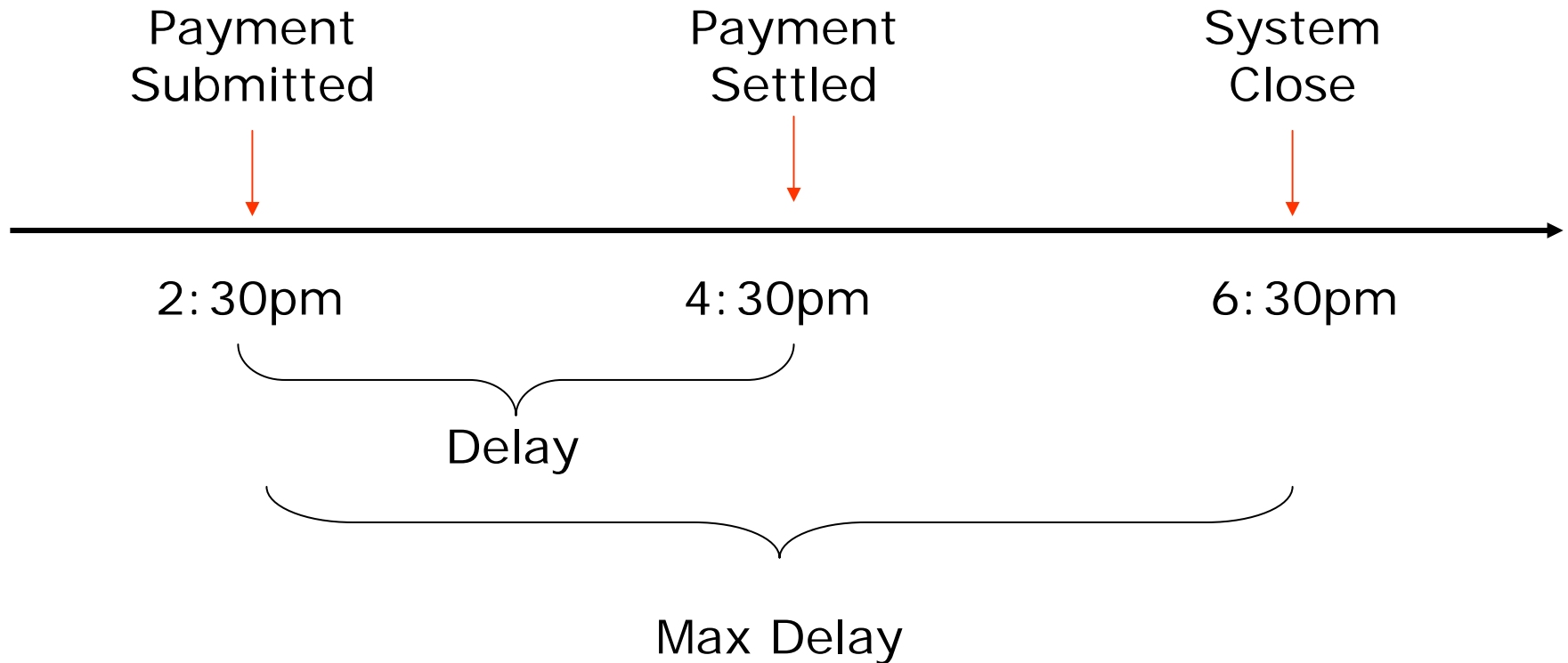


Conclusions

- BoF-PSS2 = Insight
 - ▲ GSE Policy Impact
 - Entire System
 - Groups
 - Individual Institutions



Delay Statistic



$$\text{Delay Statistic} = \frac{\text{Delay}}{\text{Max Delay}} = \frac{2 \text{ hours}}{4 \text{ hours}} = .5$$

At the system or bank level: value weighted average

