Appendix 1: The Federal Reserve Bank and the Sweep Program

The 1982 Garn-St. Germain act, which created the money market deposit account as a deposit instrument, prohibited the Federal Reserve Board from classifying such deposits as transaction accounts for reserve-requirement purposes. This prohibition is an essential element of the operation of retail deposit sweep programs. Historically, banks have introduced many inventory management schemes to reduce the amount of deposits at Federal Reserve Banks. But, prior to retail deposit sweep programs, the Federal Reserve Board promptly ended all such schemes. In most cases, it ruled that the scheme was primarily intended to evade statutory requirements and ordered that the affected deposits be subject to the same reserve requirement as other transaction deposits.

The six-transfer rule is mandated by the Garn-St. Germain act, and promulgated to banks as part of the Federal Reserve's Regulation D. Specifically, the law sets a maximum of six pre-authorized plus third-party payments per month. It does not limit the number of in-person customer withdrawals or transfers.

Actual statutory requirements are tiered, with a zero percent ratio applying to approximately the first $5 million, a 3 percent ratio applying to approximately the next $50 million, and, since 1992, a 10 percent ratio applying to the remainder. These break points are revised annually to reflect changes in bank deposits and other reservable liabilities. In 1980, the highest marginal reserve requirement was 12 percent; it was reduced to 10 percent in 1992.

The 1980 Monetary Control Act set a zero ratio for personal time and savings deposits. In 1990, the ratios for non-personal time and savings deposits, and for Eurocurrency liabilities, were reduced from 3 percent to zero. Strictly speaking, these deposit liabilities remain subject to Federal Reserve statutory reserve requirements but at a zero ratio, and the Federal Reserve Board retains the power to increase these percentages in the future, if desired. During their early years, this was an important issue for retail deposit sweep programs. Are the invisible MMDA created as part of a retail deposit sweep program personal or non-personal accounts? Some analysts argued that the accounts, although created by banks without their customers' knowledge, are personal savings deposits and hence protected from a non-zero ratio by the Monetary Control Act. Other analysts argued that the accounts were created solely by the bank as a component of the bank's inventory management system for deposits at the Federal

Reserve Banks, should be regarded as non-personal deposits which, if the Federal Reserve Board desired, could be made subject to a considerably higher ratio.

Although it is clear that operation of a retail deposit sweep program reduces the amount of sterile reserves held by banks, it is difficult to estimate how much of the related earnings have been retained by banks and how much has been realized by consumers via market competition (even though the underlying inventory technology is invisible to the customer). Recent data suggest that some portion has been realized by consumers; see Anderson (2002b).

One of the more clever exploits in sweeps occurred during the early 1990s. In that case, a large bank began sweeping transaction deposits into large-denomination time deposits with seven-day maturities. By placing one-seventh of the swept funds into each of seven different large time deposits maturing on different days of the week, it sought to provide transaction services to its customers while reducing the amount of end-of-day balances subject to statutory reserve requirements. The Federal Reserve Board ruled that this was solely a scheme to evade reserve requirements (as, of course, it was), and re-classified the involved large time as transaction deposits subject to the same reserve requirements as the initial transaction deposits. With its earnings motive destroyed, the bank dropped the sweeping activity.

Additional complex aspects of bank reserve management are relevant, but beyond the scope of this paper. Reserve balances, shown in Figure 2, comprise only about half of the deposits held by banks at the Federal Reserve. The other half are similar deposits but encumbered by clearing balance contracts with the Federal Reserve; under the terms of such contracts, the banks earn interest on the deposits if actual amounts meet or exceed contractual minimums, but incur penalties for shortfalls. The fungibility of deposits makes reserve management complex because deposits held to satisfy clearing balance contracts can, instead, be used to satisfy statutory reserve requirements. In fact, Federal Reserve accounting rules require that available deposits at Federal Reserve Banks first be applied to satisfy statutory reserve requirements and only the excess of such deposits may be applied toward satisfying a clearing balance contract. Modeling capable of handling the dynamics of this stochastic process are beyond the models in this paper.

In October 2006, The Financial Services Regulatory Relief Act of 2006 was signed into law by the President (FSRRA 2006). It authorizes the payment of interest on reserves held at Federal Reserve banks and increases flexibility of the Federal Reserve to set reserve ratios starting October 1, 2011. Depending on the rate of interest paid and the new reserve ratios the Federal Reserve sets, the amount of sweep activity will reduce, though not be eliminated (Congressional Budget Office, 2006).

Table A1: Net transactions and MMDA and BTA balances for an account when a threshold of $3000 is used for withdrawals and deposits

	Start of day			5 mins before EOB	Transfer to		End of day		Transfer
Day	MMDA	BTA (5 mins before EOB)	Net transaction	BTA	MMDA	BTA	MMDA	BTA (5 mins before EOB)	Count
1	75000	0	-3000	-3000	0	6000	69000	3000	1
2	69000	3000	-750	2250	0	0	69000	2250	1
3	69000	2250	-25500	-23250	0	26250	42750	3000	2
4	42750	3000	1000	4000	1000	0	43750	3000	2
5	43750	3000	0	3000	0	0	43750	3000	2
6	43750	3000	-2500	500	0	0	43750	500	2
7	43750	500	0	500	0	0	43750	500	2
8	43750	500	500	1000	0	0	43750	1000	2
9	43750	1000	0	1000	0	0	43750	1000	2
10	43750	1000	-30500	-29500	0	32500	11250	3000	3
11	11250	3000	0	3000	0	0	11250	3000	3
12	11250	3000	-1500	1500	0	0	11250	1500	3
13	11250	1500	500	2000	0	0	11250	2000	3
14	11250	2000	0	2000	0	0	11250	2000	3
15	11250	2000	50900	52900	49900	0	61150	3000	3
16	61150	3000	-100	2900	0	0	61150	2900	3
17	61150	2900	-4200	-1300	0	4300	56850	3000	4
18	56850	3000	0	3000	0	0	56850	3000	4
19	56850	3000	0	3000	0	0	56850	3000	4
20	56850	3000	10500	13500	10500	0	67350	3000	4
21	67350	3000	-9500	-6500	0	9500	57850	3000	5
22	57850	3000	34000	37000	34000	0	91850	3000	5
23	91850	3000	-11500	-8500	0	86350	0	86350	6
24	0	86350	-100	86250	0	0	0	86250	6
25	0	86250	0	86250	0	0	0	86250	6
26	0	86250	0	86250	0	0	0	86250	6
27	0	86250	-300	85950	0	0	0	85950	6
28	0	85950	12500	98450	0	0	0	98450	6
29	0	98450	0	98450	0	0	0	98450	6
30	0	98450	-2000	96450	0	0	0	96450	6

Table A2: Net transactions and MMDA and BTA balances for an account when a threshold of $5000 is used for withdrawals and deposits

	Start of day			5 mins before EOB	Transfer to		End of day		Transfer
Day	MMDA	BTA (5 mins before EOB)	Net transaction	BTA	MMDA	BTA	MMDA	BTA (5 mins before EOB)	Count
1	75000	0	-3000	-3000	0	8000	67000	5000	1
2	67000	5000	-750	4250	0	0	67000	4250	1
3	67000	4250	-25500	-21250	0	26250	40750	5000	2
4	40750	5000	1000	6000	1000	0	41750	5000	2
5	41750	5000	0	5000	0	0	41750	5000	2
6	41750	5000	-2500	2500	0	0	41750	2500	2
7	41750	2500	0	2500	0	0	41750	2500	2
8	41750	2500	500	3000	0	0	41750	3000	2
9	41750	3000	0	3000	0	0	41750	3000	2
10	41750	3000	-30500	-27500	0	32500	9250	5000	3
11	9250	5000	0	5000	0	0	9250	5000	3
12	9250	5000	-1500	3500	0	0	9250	3500	3
13	9250	3500	500	4000	0	0	9250	4000	3
14	9250	4000	0	4000	0	0	9250	4000	3
15	9250	4000	50900	54900	49900	0	59150	5000	3
16	59150	5000	-100	4900	0	0	59150	4900	3
17	59150	4900	-4200	700	0	0	59150	700	3
18	59150	700	0	700	0	0	59150	700	3
19	59150	700	0	700	0	0	59150	700	3
20	59150	700	10500	11200	6200	0	65350	5000	3
21	65350	5000	-9500	-4500	0	9500	55850	5000	4
22	55850	5000	34000	39000	34000	0	89850	5000	4
23	89850	5000	-11500	-6500	0	11500	78350	5000	5
24	78350	5000	-100	4900	0	0	78350	4900	5
25	78350	4900	0	4900	0	0	78350	4900	5
26	78350	4900	0	4900	0	0	78350	4900	5
27	78350	4900	-300	4600	0	0	78350	4600	5
28	78350	4600	12500	17100	12100	0	90450	5000	5
29	90450	5000	0	5000	0	0	90450	5000	5
30	90450	5000	-2000	3000	0	0	90450	3000	5