

9. Monetary Base Control III

The Monetary Base and the Money Multiplier in the UK 1963-1979

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the money multiplier, and, unless the base were contracted sufficiently, the money supply as well. As has been pointed out in the preceding discussion, it is the case that R/D and PC/D declined dramatically, and h3 and LM3 increased sharply after September 1971; h1 and M1, on the other hand, did not, because of the offsetting decrease in the demand-deposits-to-total-deposits ratio. (The decline in the DD/D ratio was to be expected just as was the decline in PC/D, but its fully offsetting effect was not to be expected.) The decline in the banks' reserve ratio (R/D) was almost certainly attributable to the changes in the financial system -- in particular the lowering of the required cash-reserve ratio for London clearing banks from 8 to 1-1/2 percent. Other factors may have contributed also, but it is likely that most of the decline in the reserve ratio was due to the sharp decrease in "legal" cash-reserve requirements and thus represented an expansionary force unless offset by a decrease in the amount of bank reserves. On the other hand, the decline in the nonbank public's currency ratio (PC/D) is likely to have been at least partially attributable to reintermediation since a switch by the nonbank public from money substitutes to money (i.e., bank deposits), holding their demand for currency constant, would result in a decline in the currency-to-bank-deposit ratio. However, much of the decline in the currency ratio probably was caused by the banks' use of interest rates to attract deposits, which, as mentioned earlier, was a part of the 1971 financial changes. Thus at least some of the decline in the currency ratio probably also represented an expansionary force.

As the data in Table 1 indicate, the monetary base was not contracted in order to offset the changes in the banks' reserve ratio and the nonbank public's currency ratio and the resulting change in the sterling M3 multiplier. On the contrary, between December 1970 and December 1972 (1973), the monetary base increased some 22 (33) percent while the sterling M3 money multiplier increased about 14 (33) percent. Thus the broad money supply increased about

42 (79) percent. The increases in narrow money during these periods were somewhat less than these figures -- 26 and 32 percent, respectively -- as explained earlier in this section.

The impact of the CCC system on the sterling M3 money multiplier can be seen clearly in Chart 2. The CCC reforms were implemented on September 16, 1971 and the first observation on the chart completely under the new regime is that of December 1971, which is marked by the vertical line labeled "CCC". Prior to CCC, the sterling M3 multiplier had been fairly stable near a value of 4 with a slight upward trend. Towards the end of 1971 the behavior of the multiplier changed dramatically and it moved sharply upward until the institution of the supplementary-special-deposits (SSD) scheme -- quantitative limits on the expansion of interest-bearing bank liabilities -- on December 17, 1973 seems to have brought its climb to a halt. The first observation on the chart under the SSD regime is that of March 1974, which is marked by the vertical line labeled "SSD". After December 1973, the money multiplier fell somewhat and then stabilized at a value of approximately 5. Note also that after September 1971 -- i.e., the introduction of CCC -- the values of the banks' reserve and nonbank currency ratios shift downward; none of the R/D values after September 1971 exceeds any of the R/D values before that date and the same is true for the PC/D series as well. The shift in the banks' reserve ratio is particularly striking and appears to have been permanent; the decline in the nonbank currency ratio -- while even more dramatic than that of the banks' reserve ratio -- was not sustained, probably because of the effects of the SSD scheme on the competition among banks for deposits.

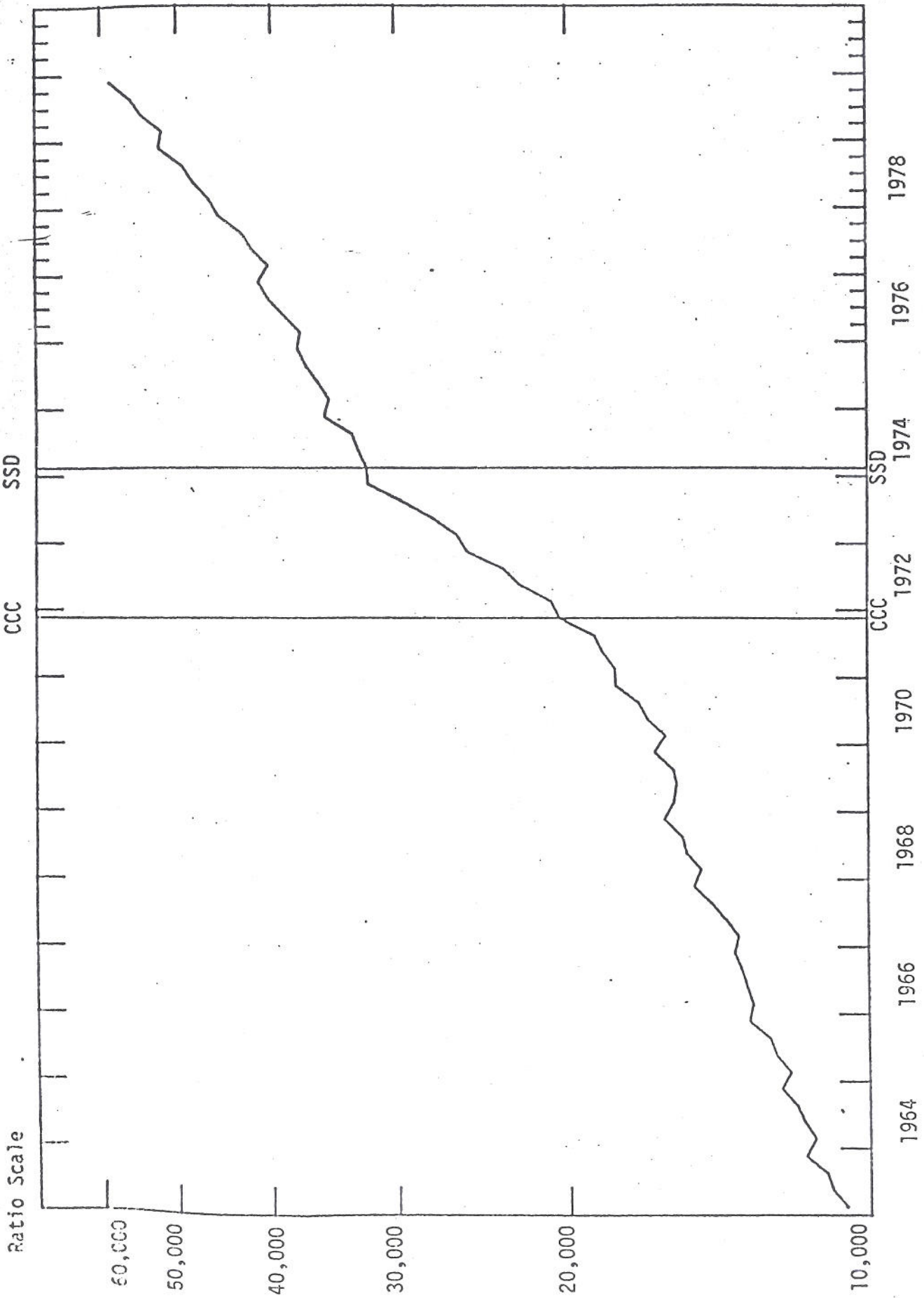
The evidence presented in Chart 2 is not conclusive. In particular, the downward trend in R/D prior to CCC and the partial reversal of the decline in PC/D raise the possibility that the change in the money multiplier after September 1971 was caused by factors omitted in the above analysis. Examples

of such factors are the changing structure of the banking system -- only the London clearing banks were subject to the 8 percent cash-reserve requirement -- over time and interest-rate movements. In addition, expectations of a financial reform may have influenced the behavior of the ratios prior to the actual implementation of CCC -- a consultative document was issued in May 1971. A complete model of the determinants of the money multiplier is beyond the scope of this paper. For present purposes it is assumed that the decline in R/D was mostly attributable to the lowering of cash-reserve requirements under CCC but that most of the movement in PC/D was caused by transitory interest-rate movements. Thus, the probable effect of CCC on the money multiplier is estimated to have been to increase the multiplier from 4 to 5, rather than the value of nearly 6 which it reached just prior to the implementation of the SSD scheme.^{10/}

The conclusion to be drawn from the preceding discussion is that the U.K. economy in the early 1970's was subjected to a substantial monetary shock attributable in large part to the "competition and credit control" system introduced in 1971 and the failure to offset the effects on the money supply of the 1971 measures. It is estimated here that CCC increased the broad money supply by roughly 25 percent by raising the sterling M3 money multiplier from approximately 4 to about 5. Another way of presenting the impact of CCC on the money stock is to plot sterling M3 on a ratio scale and mark off the CCC and SSD periods as in Charts 1 and 2. The result -- see Chart 3 -- shows quite clearly that the rate of growth of sterling M3 accelerated after the CCC reforms and decelerated when the SSD scheme was imposed. The period between the CCC and SSD lines in Chart 3 can be viewed roughly as the period during which the money multiplier adjusted to the new monetary regime; the chart indicates that this adjustment involved an acceleration in monetary growth.

CHART 3

LM3 (Em)



V. Conclusion

In this paper the monetary base and the money multiplier in the United Kingdom have been discussed and the data necessary for examining their behavior during the period 1963-1979 have been constructed and collected. The discussion in the preceding section of this paper indicates that the monetary-base or money-multiplier approach to monetary analysis appears to be potentially useful for the understanding of British monetary developments. In particular, the sharp increases in monetary growth rates experienced during the early 1970's seem to be readily explained in terms of predictable changes in various behavioral ratios in response to policy measures taken during that period. Thus further research into the determination of the ratios appearing in the money-multiplier expressions would appear to be useful. Such research should involve the construction of theoretical models of each component of the money multiplier, econometric estimation of the resulting equations, and an empirical investigation into the properties of the estimated equation. A first step in this research program has been reported elsewhere (see Howard) in which the banking system's demand-for-cash-reserves function during the period 1973-1978 is investigated econometrically. However, further econometric work is beyond the scope of the present study. In fact, the major structural changes that have taken place in the British monetary system since 1963 would seem to make it extremely difficult, and perhaps impossible, to model the necessary functions for the entire period 1963-1979. The analyst must either model carefully each structural change or simply analyze sub-periods in which there was no major structural change (as was done in Howard). Recent policy actions -- the termination of exchange controls in 1979 and the abandonment of the supplementary-special-deposits scheme in 1980 -- seem to imply that the analyst interested in studying the current U.K. monetary

system must attempt to model the changes or wait several years for sufficient data to be generated under the new policy regime.^{11/} It is to be hoped that further research on the determinants of the British money multiplier will be undertaken, given that the evidence reported in this paper and in the earlier paper (Howard) indicate that it may well be a promising area for research in British monetary economics and that such research may prove to be useful to British policymakers.

Appendix: Data

All data used in this study are from the Bank of England's Quarterly Bulletin and its Statistical Abstract unless otherwise indicated. The data are not seasonally adjusted. Most monetary statistics are reported for a Wednesday near the middle of the month; this date is referred to in this study as "mid-month".

In Table A1, end-of-quarter data on M1, sterling M3, and some of their components are presented. The two monetary aggregates are adjusted for breaks in the series by the Bank of England. Nonbank holdings of notes and coin are subtracted from M1 and £M3 in order to obtain, respectively, DD and D.

Table A2 reports mid-month data on the Bank of England's liabilities for the last month of the quarter. The entries in this table are explained in the main text; recall that "Notes" refers solely to Bank of England notes in circulation outside of the Bank and that "Special deposits" include supplementary special deposits.

In Table A3, data on notes and coin are reported. The data on coin in circulation are estimated weekly averages for the last month of the quarter and are taken in part from the Central Statistical Office's Financial Statistics; the value for December 1979 is estimated for this study. BN and VC are defined in the main text; some of the data on the Northern Ireland banks are estimated for this study. The two alternative measures of nonbank holdings of notes and coin other than BN are:

$$PC1 \equiv \text{Notes} + \text{Coin in circulation} + 5 - VC,$$

where "Notes" is from Table A2, "Coin in circulation" and VC are from Table A3, and the constant 5 is the fiduciary component of the private bank-note issue; and

$PC2 \equiv$ Nonbank holdings of notes and coin - BN,

where "Nonbank holdings of notes and coin" is from Table A1 and BN is from Table A3.

Table A4 presents data on two alternative measures of the monetary base and some data on banks' cash reserves. B1, B2, and R are:

$B1 \equiv$ Notes + PD + BD + ROA + Coin in circulation + 5,

$B2 \equiv$ PC2 + VC + PD + BD + ROA,

$R \equiv$ BD + VC,

where "Notes", PD, BD, and ROA are from Table A2, "Coin in circulation", PC2, and VC are from Table A3, and the constant 5 is the fiduciary part of the private bank-note issue. The method used to compute RR and XR is presented in the text.

TABLE A1
Monetary Aggregates and Components (Em)

Period	M1	EM3	Nonbank holdings of notes & coin	DD	D	Period	M1	EM3	Nonbank holdings of notes & coin	DD	D
6301	7245	10567	2248	4997	8319	7103	11182	18839	3454	7728	15385
6302	7447	10928	2290	5157	8638	7104	11707	20372	3589	8118	16783
6303	7559	11089	2228	5331	8861	7201	11781	20812	3755	8026	17057
6304	7979	11616	2251	5728	9365	7202	12314	22417	3860	8454	18557
6401	7773	11347	2309	5464	9038	7203	12527	23329	3905	8622	19424
6402	7858	11653	2326	5532	9327	7204	13295	25355	4079	9216	21276
6403	8031	11871	2325	5706	9546	7301	12940	26034	4170	8770	21864
6404	8219	12265	2451	5768	9814	7302	13832	27588	4349	9483	23239
6501	8000	12017	2401	5599	9616	7303	13520	29673	4301	9219	25372
6502	8107	12435	2476	5631	9959	7304	13967	32029	4377	9590	27652
6503	8198	12610	2533	5665	10077	7401	13382	32148	4574	8808	27574
6504	8524	13198	2636	5888	10562	7402	13801	32683	4767	9034	27916
6601	8429	13094	2633	5796	10461	7403	14163	33241	4772	9391	28469
6602	9380	13270	2699	5681	10571	7404	15457	35282	5085	10372	30197
6603	8466	13412	2713	5753	10699	7501	15426	34885	5448	9978	29437
6604	8511	13646	2695	5816	10951	7502	15901	35823	5370	10531	30453
6701	8424	13494	2751	5673	10743	7503	16773	36832	5482	11291	31350
6702	8551	13895	2793	5768	11102	7504	17483	37595	5904	11579	31691
6703	8933	14343	2760	6173	11583	7601	17801	37320	5915	11886	31405
6704	9252	14937	2815	6437	12122	7602	18290	38713	6188	12102	32525
6801	8981	14694	2851	6130	11843	7603	19227	40230	6495	12732	33735
6802	9140	15198	2910	6230	12288	7604	19467	41160	6714	12753	34446
6803	9275	15345	2804	6471	12541	7701	19566	40149	6801	12765	33348
6804	9636	15961	2859	6777	13102	7702	20410	41822	7079	13331	34743
6901	9120	15639	2914	6206	12725	7703	22049	42901	7287	14762	35614
6902	8948	15514	2909	6039	12605	7704	23659	45290	7699	15960	37591
6903	9097	15668	2857	6240	12811	7801	24270	46382	7966	16304	38416
6904	9647	16339	3006	6641	13333	7802	24762	48144	8293	16469	39851
7001	9294	15911	3040	6254	12871	7803	26046	49373	8525	17521	40848
7002	9682	16589	3081	6601	13508	7804	27535	52062	8904	18631	43158
7003	9878	16976	3154	6724	13822	7901	27495	51678	9140	18355	42538
7004	10554	17893	3320	7234	14573	7902	27892	54252	9305	18587	44947
7101	10607	17930	3324	7283	14606	7903	28957	55850	9519	19438	46331
7102	10760	18389	3373	7387	15016	7904	30046	58677	9701	20345	48976

Liabilities of the Bank of England (£m)

Period	Notes	PD	BD	ROA	Special deposits	Period	Notes	PD	BD	ROA	Special deposits
6301	2312	18	258	74	0	7103	3672	12	204	316	0
6302	2387	15	241	71	0	7104	3785	11	181	333	0
6303	2405	17	243	74	0	7201	3717	14	191	370	0
6304	2556	12	229	75	0	7202	3924	20	256	367	0
6401	2472	14	264	70	0	7203	4004	21	189	289	0
6402	2554	21	254	81	0	7204	4379	21	224	252	119
6403	2580	13	266	81	0	7301	4224	28	202	333	728
6404	2756	15	256	85	0	7302	4405	20	268	349	754
6501	2631	12	294	86	0	7303	4454	25	247	298	1098
6502	2740	13	278	84	92	7304	4788	23	195	311	1439
6503	2752	11	282	93	94	7401	4629	31	290	320	1351
6504	2930	15	247	94	96	7402	4859	14	237	317	894
6601	2799	15	283	96	97	7403	5115	17	290	431	922
6602	2922	13	258	111	98	7404	5520	18	300	334	928
6603	2894	14	274	117	198	7501	5419	25	359	471	943
6604	3036	12	248	108	198	7502	5669	21	297	436	966
6701	2895	15	285	112	197	7503	5848	20	304	409	980
6702	2962	12	271	107	202	7504	6138	21	322	420	989
6703	2975	15	304	112	208	7601	6088	18	265	432	983
6704	3160	12	259	118	213	7602	6379	17	378	487	1000
6801	3043	16	312	126	214	7603	6641	21	271	520	1043
6802	3115	13	332	128	216	7604	6858	17	325	484	1806
6803	3141	14	312	138	222	7701	6757	21	317	509	1027
6804	3282	12	278	137	226	7702	7166	19	310	561	1055
6901	3168	15	343	143	228	7703	7273	21	334	573	1110
6902	3235	15	305	144	221	7704	8019	23	428	586	1185
6903	3251	18	268	147	223	7801	7817	24	267	701	1246
6904	3370	12	221	141	224	7802	8158	24	399	581	656
7001	3284	16	203	133	215	7803	8474	22	369	728	641
7002	3384	13	171	124	262	7804	9122	25	423	689	1099
7003	3479	13	178	191	270	7901	8961	28	426	580	2
7004	3592	11	167	163	388	7902	9165	28	477	615	741
7101	3672	15	316	260	398	7903	9418	27	497	679	772
7102	3683	11	211	272	404	7904	10089	20	462	697	806

970
 207
 dollar
 1970

TABLE A3

Notes and Coin (Em)

Period	Coin in circulation	BN	VC	PC1	PC2	Period	Coin in circulation	BN	VC	PC1	PC2
6301	208	121	518	2007	2127	7103	349	177	852	3174	3277
6302	207	126	560	2039	2164	7104	345	191	852	3283	3398
6303	206	124	552	2064	2104	7201	344	195	784	3282	3560
6304	206	128	628	2139	2123	7202	346	197	834	3441	3663
6401	207	125	569	2115	2184	7203	346	195	832	3523	3710
6402	207	129	603	2163	2197	7204	359	211	939	3804	3868
6403	207	124	609	2183	2201	7301	363	209	850	3742	3961
6404	208	128	682	2287	2323	7302	364	218	901	3873	4131
6501	209	127	596	2249	2274	7303	367	226	958	3868	4075
6502	210	132	651	2304	2344	7304	383	239	1044	4132	4138
6503	210	126	644	2323	2407	7401	385	235	925	4094	4339
6504	212	133	718	2429	2503	7402	389	246	1000	4253	4521
6601	216	132	640	2380	2501	7403	394	254	1030	4484	4518
6602	218	136	687	2458	2563	7404	415	272	1142	4798	4813
6603	218	129	671	2446	2584	7501	419	280	1031	4812	5168
6604	221	135	738	2524	2560	7502	428	292	1088	5014	5078
6701	222	134	663	2459	2617	7503	435	294	1079	5209	5188
6702	223	140	698	2492	2653	7504	450	310	1154	5439	5594
6703	223	134	688	2515	2626	7601	454	317	1041	5506	5598
6704	225	143	753	2637	2672	7602	457	325	1093	5748	5863
6801	226	142	690	2584	2709	7603	459	331	1115	5990	6164
6802	231	149	731	2620	2761	7604	483	345	1154	6369	6369
6803	232	144	740	2638	2660	7701	486	350	1086	6451	6451
6804	238	150	793	2732	2709	7702	488	364	1230	6715	6715
6901	251	151	729	2695	2763	7703	491	368	1141	6919	6919
6902	257	155	782	2715	2754	7704	509	401	1334	7298	7298
6903	253	149	786	2723	2708	7801	516	408	1185	7558	7558
6904	334	158	880	2829	2848	7802	534	424	1242	7455	7455
7001	335	159	803	2821	2881	7803	543	431	1248	7774	7774
7002	340	165	839	2890	2916	7804	570	455	1423	8274	8274
7003	344	164	857	2971	2990	7901	577	460	1276	8267	8267
7004	349	171	874	3072	3149	7902	592	462	1380	8382	8382
7101	378	176	898	3157	3148	7903	597	461	1327	8693	8693
7102	358	178	899	3147	3195	7904	630	493	1489	9235	9235

TABLE A4

Monetary Base and Banks' Cash Reserves (£m)

Period	B1	B2	R	RR	XR	Period	B1	B2	R	RR	XR
6301	2875	2995	776	614	162	7103	4558	4661	1056	902	154
6302	2926	3051	801	622	179	7104	4660	4775	1033	160	873
6303	2950	2990	795	639	156	7201	4641	4919	975	163	812
6304	3083	3067	857	661	196	7202	4918	5140	1090	176	914
6401	3032	3101	833	655	178	7203	4854	5041	1021	191	830
6402	3122	3156	857	675	182	7204	5240	5304	1163	195	968
6403	3152	3170	875	687	188	7301	5155	5374	1052	216	836
6404	3325	3361	938	703	235	7302	5411	5669	1169	220	949
6501	3237	3262	890	694	196	7303	5396	5603	1205	245	960
6502	3330	3370	929	705	224	7304	5705	5711	1239	255	984
6503	3353	3437	926	719	207	7401	5660	5905	1215	259	956
6504	3503	3577	965	736	229	7402	5821	6089	1237	261	976
6601	3414	3535	923	742	181	7403	6252	6286	1320	273	1047
6602	3527	3632	945	743	202	7404	6592	6607	1442	277	1165
6603	3522	3660	945	752	193	7501	6698	7054	1390	281	1109
6604	3630	3666	986	754	232	7502	6856	6920	1385	283	1102
6701	3534	3692	948	749	199	7503	7021	7000	1383	282	1101
6702	3580	3741	969	768	201	7504	7356	7511	1476	283	1193
6703	3634	3745	992	789	203	7601	7262	7354	1306	282	1024
6704	3779	3814	1012	810	202	7602	7723	7838	1471	283	1188
6801	3728	3853	1002	811	191	7603	7917	8091	1386	293	1093
6902	3824	3965	1063	819	244	7604	8172	8349	1479	309	1170
6803	3842	3864	1052	843	209	7701	8095	8384	1403	294	1109
6804	3952	3929	1071	854	217	7702	8549	8835	1540	299	1241
6901	3925	3993	1072	852	220	7703	8697	8988	1475	314	1161
6902	3961	4000	1087	839	248	7704	9570	9669	1762	334	1428
6903	3942	3927	1054	848	206	7801	9330	9735	1452	357	1095
6904	4083	4102	1101	850	251	7802	9701	10115	14641	374	1267
7001	3976	4036	1006	781	225	7803	10141	10461	1617	375	1242
7002	4037	4063	1010	796	214	7804	10834	11009	1846	381	1465
7003	4210	4229	1035	822	213	7901	10577	10990	1702	388	1314
7004	4287	4364	1041	843	198	7902	10882	11343	1857	411	1446
7101	4646	4637	1214	864	350	7903	11223	11588	1824	430	1394
7102	4540	4588	1110	878	232	7904	11903	11876	1951	447	1504

10%
8%
Growth. Grow

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Footnotes

- */ International Finance Division, Federal Reserve Board. This paper represents the views of the author and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or other members of its staff.
- 1/ Other items included in B, such as the public sector's cash deposits at the Bank of England, are ignored in this section.
- 2/ Special deposits are omitted from the definition of B because they are not transferable and therefore are not used to settle accounts and for clearing purposes. Even though special deposits are a liability of the central bank, they are not a monetary liability. For a further discussion of this point, see Howard, in which it is argued that it is not very important analytically whether special deposits are included in B. (For the present study, however, it is important -- for expository reasons -- that special deposits not be included in B.)
- 3/ Most British monetary data are reported for a Wednesday near the middle of the month; this date is referred to in this study as "mid-month."
- 4/ It is an estimate because the data on coin are not mid-month and are estimated.
- 5/ In this study, the discount houses are treated as banks (see Howard for a discussion of this consolidation). However, in this instance it is necessary to distinguish between discount houses and banks in order to arrive at the correct figure for vault cash. That is, the data on bankers deposits to be subtracted from the notes, coin, and bankers deposits aggregate must exclude those bankers deposits held by the discount houses.

- 6/ Eligible liabilities essentially are sterling deposit liabilities (see Bank of England for the exact definition).
- 7/ An alternative required reserves series could be constructed by adding BN -- the required reserves backing the issue of bank notes -- to the required reserves data presented in the Appendix.
- 8/ Note the relatively small size of these ratios.
- 9/ See U.K. Treasury and Bank of England, pp. 18-19. The supplementary-special-deposits scheme introduced in December 1973 was aimed at restricting the growth of interest-bearing bank liabilities.
- 10/ Although CCC may well have been responsible for the interest-rate movements and thus for the movements in the PC/D ratio as well, it is assumed that most of the change in rates would not have been permanent.
- 11/ Other major structural changes may be in the offing; see, for example, U.K. Treasury and Bank of England.