



MACROECONOMICS,  
TRADE AND  
INVESTMENT

The image shows a close-up of a person's hand holding an open yellow ledger. The ledger has two pages visible, both with the heading "LOAN REPAYMENT". The pages contain handwritten entries in a grid format. The columns are labeled "Date", "Re", "Sign", "Date", and "Re". The entries are handwritten in black ink. The background is blurred, showing what appears to be a person's face and some other objects.

Date	Re	Sign	Date	Re
2018/3	20	1860	08/11	1020
4127	20	1180	07/11	1120
1-9/1	20	1220	07/11	1120
1-9/1	20	1220	07/11	1120
31914	20	1240	08/11	1140
51913	20	1260	08/11	1160
61917	20	1280	08/11	1180
81911	40	1320	08/11	1240
91912	20	1340	08/11	1260
101912	20	1360	08/11	1280
111917	20	1380	08/11	1300
121910	20	1400	08/11	1320
131911	20	1420	08/11	1340
141911	20	1440	08/11	1360
151911	20	1460	08/11	1380
161911	20	1480	08/11	1400
171911	20	1500	08/11	1420
181911	20	1520	08/11	1440
191911	20	1540	08/11	1460
201911	20	1560	08/11	1480
211911	20	1580	08/11	1500
221911	20	1600	08/11	1520
231911	20	1620	08/11	1540
241911	20	1640	08/11	1560
251911	20	1660	08/11	1580
261911	20	1680	08/11	1600
271911	20	1700	08/11	1620
281911	20	1720	08/11	1640
291911	20	1740	08/11	1660
301911	20	1760	08/11	1680
311911	20	1780	08/11	1700
321911	20	1800	08/11	1720
331911	20	1820	08/11	1740
341911	20	1840	08/11	1760
351911	20	1860	08/11	1780
361911	20	1880	08/11	1800
371911	20	1900	08/11	1820
381911	20	1920	08/11	1840
391911	20	1940	08/11	1860
401911	20	1960	08/11	1880
411911	20	1980	08/11	1900
421911	20	2000	08/11	1920
431911	20	2020	08/11	1940
441911	20	2040	08/11	1960
451911	20	2060	08/11	1980
461911	20	2080	08/11	2000
471911	20	2100	08/11	2020
481911	20	2120	08/11	2040
491911	20	2140	08/11	2060
501911	20	2160	08/11	2080
511911	20	2180	08/11	2100
521911	20	2200	08/11	2120
531911	20	2220	08/11	2140
541911	20	2240	08/11	2160
551911	20	2260	08/11	2180
561911	20	2280	08/11	2200
571911	20	2300	08/11	2220
581911	20	2320	08/11	2240
591911	20	2340	08/11	2260
601911	20	2360	08/11	2280
611911	20	2380	08/11	2300
621911	20	2400	08/11	2320
631911	20	2420	08/11	2340
641911	20	2440	08/11	2360
651911	20	2460	08/11	2380
661911	20	2480	08/11	2400
671911	20	2500	08/11	2420
681911	20	2520	08/11	2440
691911	20	2540	08/11	2460
701911	20	2560	08/11	2480
711911	20	2580	08/11	2500
721911	20	2600	08/11	2520
731911	20	2620	08/11	2540
741911	20	2640	08/11	2560
751911	20	2660	08/11	2580
761911	20	2680	08/11	2600
771911	20	2700	08/11	2620
781911	20	2720	08/11	2640
791911	20	2740	08/11	2660
801911	20	2760	08/11	2680
811911	20	2780	08/11	2700
821911	20	2800	08/11	2720
831911	20	2820	08/11	2740
841911	20	2840	08/11	2760
851911	20	2860	08/11	2780
861911	20	2880	08/11	2800
871911	20	2900	08/11	2820
881911	20	2920	08/11	2840
891911	20	2940	08/11	2860
901911	20	2960	08/11	2880
911911	20	2980	08/11	2900
921911	20	3000	08/11	2920
931911	20	3020	08/11	2940
941911	20	3040	08/11	2960
951911	20	3060	08/11	2980
961911	20	3080	08/11	3000
971911	20	3100	08/11	3020
981911	20	3120	08/11	3040
991911	20	3140	08/11	3060
1001911	20	3160	08/11	3080
1011911	20	3180	08/11	3100
1021911	20	3200	08/11	3120
1031911	20	3220	08/11	3140
1041911	20	3240	08/11	3160
1051911	20	3260	08/11	3180
1061911	20	3280	08/11	3200
1071911	20	3300	08/11	3220
1081911	20	3320	08/11	3240
1091911	20	3340	08/11	3260
1101911	20	3360	08/11	3280
1111911	20	3380	08/11	3300
1121911	20	3400	08/11	3320
1131911	20	3420	08/11	3340
1141911	20	3440	08/11	3360
1151911	20	3460	08/11	3380
1161911	20	3480	08/11	3400
1171911	20	3500	08/11	3420
1181911	20	3520	08/11	3440
1191911	20	3540	08/11	3460
1201911	20	3560	08/11	3480
1211911	20	3580	08/11	3500
1221911	20	3600	08/11	3520
1231911	20	3620	08/11	3540
1241911	20	3640	08/11	3560
1251911	20	3660	08/11	3580
1261911	20	3680	08/11	3600
1271911	20	3700	08/11	3620
1281911	20	3720	08/11	3640
1291911	20	3740	08/11	3660
1301911	20	3760	08/11	3680
1311911	20	3780	08/11	3700
1321911	20	3800	08/11	3720
1331911	20	3820	08/11	3740
1341911	20	3840	08/11	3760
1351911	20	3860	08/11	3780
1361911	20	3880	08/11	3800
1371911	20	3900	08/11	3820
1381911	20	3920	08/11	3840
1391911	20	3940	08/11	3860
1401911	20	3960	08/11	3880
1411911	20	3980	08/11	3900
1421911	20	4000	08/11	3920
1431911	20	4020	08/11	3940
1441911	20	4040	08/11	3960
1451911	20	4060	08/11	3980
1461911	20	4080	08/11	4000
1471911	20	4100	08/11	4020
1481911	20	4120	08/11	4040
1491911	20	4140	08/11	4060
1501911	20	4160	08/11	4080
1511911	20	4180	08/11	4100
1521911	20	4200	08/11	4120
1531911	20	4220	08/11	4140
1541911	20	4240	08/11	4160
1551911	20	4260	08/11	4180
1561911	20	4280	08/11	4200
1571911	20	4300	08/11	4220
1581911	20	4320	08/11	4240
1591911	20	4340	08/11	4260
1601911	20	4360	08/11	4280
1611911	20	4380	08/11	4300
1621911	20	4400	08/11	4320
1631911	20	4420	08/11	4340
1641911	20	4440	08/11	4360
1651911	20	4460	08/11	4380
1661911	20	4480	08/11	4400
1671911	20	4500	08/11	4420
1681911	20	4520	08/11	4440
1691911	20	4540	08/11	4460
1701911	20	4560	08/11	4480
1711911	20	4580	08/11	4500
1721911	20	4600	08/11	4520
1731911	20	4620	08/11	4540
1741911	20	4640	08/11	4560
1751911	20	4660	08/11	4580
1761911	20	4680	08/11	4600
1771911	20	4700	08/11	4620
1781911	20	4720	08/11	4640
1791911	20	4740	08/11	4660
1801911	20	4760	08/11	4680
1811911	20	4780	08/11	4700
1821911	20	4800	08/11	4720
1831911	20	4820	08/11	4740
1841911	20	4840	08/11	4760
1851911	20	4860	08/11	4780
1861911	20	4880	08/11	4800
1871911	20	4900	08/11	4820
1881911	20	4920	08/11	4840
1891911	20	4940	08/11	4860
1901911	20	4960	08/11	4880
1911911	20	4980	08/11	4900
1921911	20	5000	08/11	4920
1931911	20	5020	08/11	4940
1941911	20	5040	08/11	4960
1951911	20	5060	08/11	4980
1961911	20	5080	08/11	5000
1971911	20	5100	08/11	5020
1981911	20	5120	08/11	5040
1991911	20	5140	08/11	5060
2001911	20	5160	08/11	5080
2011911	20	5180	08/11	5100
2021911	20	5200	08/11	5120
2031911	20	5220	08/11	5140
2041911	20	5240	08/11	5160
2051911	20	5260	08/11	5180
2061911	20	5280	08/11	5200
2071911	20	5300	08/11	5220
2081911	20	5320	08/11	5240
2091911	20	5340	08/11	5260
2101911	20	5360	08/11	5280
2111911	20	5380	08/11	5300
2121911	20	5400	08/11	5320
2131911	20	5420	08/11	5340
2141911	20	5440	08/11	5360
2151911	20	5460	08/11	5380
2161911	20	5480	08/11	5400
2171911	20	5500	08/11	5420
2181911	20	5520	08/11	5440
2191911	20	5540	08/11	5460
2201911	20	5560	08/11	5480
2211911	20	5580	08/11	5500
2221911	20	5600	08/11	5520
2231911	20	5620	08/11	5540
2241911	20	5640	08/11	5560
2251911	20	5660	08/11	5580
2261911	20	5680	08/11	5600
2271911	20	5700	08/11	5620
2281911	20	5720	08/11	5640
2291911	20	5740	08/11	5660
2301911	20	5760	08/11	5680
2311911	20	5780	08/11	5700
2321911	20	5800	08/11	5720
2331911	20	5820	08/11	5740
2341911	20	5840	08/11	5760
2351911	20	5860	08/11	5780
2361911	20	5880	08/11	5800
2371911	20	5900	08/11	5820
2381911	20	5920	08/11	5840
2391911	20	5940	08/11	5860
2401911	20			

# LOAN REPAYMENT

Date	Paid	Sign	Date	Paid
1/18/77	2.0	1860	AM	1080
3/18/77	2.0	1180	AM	1100
5/18/77	2.0	1200	AM	1120
7/18/77	2.0	1220	AM	1140
9/18/77	2.0	1240	AM	1160
11/18/77	2.0	1260	AM	1180
1/19/78	2.0	1280	AM	1200
3/19/78	2.0	1300	AM	1220
5/19/78	4.0	1320	AM	1240
7/19/78	2.0	1340	AM	1260
9/19/78	2.0	1360	AM	1280
11/19/78	2.0	1380	AM	1300
1/20/79	2.0	1400	AM	1320
3/20/79	2.0	1420	AM	1340
5/20/79	2.0	1440	AM	1360
7/20/79	2.0	1460	AM	1380
9/20/79	2.0	1480	AM	1400
11/20/79	2.0	1500	AM	1420
1/21/80	2.0	1520	AM	1440
3/21/80	2.0	1540	AM	1460
5/21/80	2.0	1560	AM	1480
7/21/80	2.0	1580	AM	1500
9/21/80	2.0	1600	AM	1520
11/21/80	2.0	1620	AM	1540
1/22/81	2.0	1640	AM	1560
3/22/81	2.0	1660	AM	1580
5/22/81	2.0	1680	AM	1600
7/22/81	2.0	1700	AM	1620
9/22/81	2.0	1720	AM	1640
11/22/81	2.0	1740	AM	1660
1/23/82	2.0	1760	AM	1680
3/23/82	2.0	1780	AM	1700
5/23/82	2.0	1800	AM	1720
7/23/82	2.0	1820	AM	1740
9/23/82	2.0	1840	AM	1760
11/23/82	2.0	1860	AM	1780
1/24/83	2.0	1880	AM	1800
3/24/83	2.0	1900	AM	1820
5/24/83	2.0	1920	AM	1840
7/24/83	2.0	1940	AM	1860
9/24/83	2.0	1960	AM	1880
11/24/83	2.0	1980	AM	1900
1/25/84	2.0	2000	AM	1920
3/25/84	2.0	2020	AM	1940
5/25/84	2.0	2040	AM	1960
7/25/84	2.0	2060	AM	1980
9/25/84	2.0	2080	AM	2000
11/25/84	2.0	2100	AM	2020
1/26/85	2.0	2120	AM	2040
3/26/85	2.0	2140	AM	2060
5/26/85	2.0	2160	AM	2080
7/26/85	2.0	2180	AM	2100
9/26/85	2.0	2200	AM	2120
11/26/85	2.0	2220	AM	2140
1/27/86	2.0	2240	AM	2160
3/27/86	2.0	2260	AM	2180
5/27/86	2.0	2280	AM	2200
7/27/86	2.0	2300	AM	2220
9/27/86	2.0	2320	AM	2240
11/27/86	2.0	2340	AM	2260
1/28/87	2.0	2360	AM	2280
3/28/87	2.0	2380	AM	2300
5/28/87	2.0	2400	AM	2320
7/28/87	2.0	2420	AM	2340
9/28/87	2.0	2440	AM	2360
11/28/87	2.0	2460	AM	2380
1/29/88	2.0	2480	AM	2400
3/29/88	2.0	2500	AM	2420
5/29/88	2.0	2520	AM	2440
7/29/88	2.0	2540	AM	2460
9/29/88	2.0	2560	AM	2480
11/29/88	2.0	2580	AM	2500
1/30/89	2.0	2600	AM	2520
3/30/89	2.0	2620	AM	2540
5/30/89	2.0	2640	AM	2560
7/30/89	2.0	2660	AM	2580
9/30/89	2.0	2680	AM	2600
11/30/89	2.0	2700	AM	2620
1/31/90	2.0	2720	AM	2640
3/31/90	2.0	2740	AM	2660
5/31/90	2.0	2760	AM	2680
7/31/90	2.0	2780	AM	2700
9/31/90	2.0	2800	AM	2720
11/31/90	2.0	2820	AM	2740
1/1/91	2.0	2840	AM	2760
3/1/91	2.0	2860	AM	2780
5/1/91	2.0	2880	AM	2800
7/1/91	2.0	2900	AM	2820
9/1/91	2.0	2920	AM	2840
11/1/91	2.0	2940	AM	2860
1/2/92	2.0	2960	AM	2880
3/2/92	2.0	2980	AM	2900
5/2/92	2.0	3000	AM	2920
7/2/92	2.0	3020	AM	2940
9/2/92	2.0	3040	AM	2960
11/2/92	2.0	3060	AM	2980
1/3/93	2.0	3080	AM	3000
3/3/93	2.0	3100	AM	3020
5/3/93	2.0	3120	AM	3040
7/3/93	2.0	3140	AM	3060
9/3/93	2.0	3160	AM	3080
11/3/93	2.0	3180	AM	3100
1/4/94	2.0	3200	AM	3120
3/4/94	2.0	3220	AM	3140
5/4/94	2.0	3240	AM	3160
7/4/94	2.0	3260	AM	3180
9/4/94	2.0	3280	AM	3200
11/4/94	2.0	3300	AM	3220
1/5/95	2.0	3320	AM	3240
3/5/95	2.0	3340	AM	3260
5/5/95	2.0	3360	AM	3280
7/5/95	2.0	3380	AM	3300
9/5/95	2.0	3400	AM	3320
11/5/95	2.0	3420	AM	3340
1/6/96	2.0	3440	AM	3360
3/6/96	2.0	3460	AM	3380
5/6/96	2.0	3480	AM	3400
7/6/96	2.0	3500	AM	3420
9/6/96	2.0	3520	AM	3440
11/6/96	2.0	3540	AM	3460
1/7/97	2.0	3560	AM	3480
3/7/97	2.0	3580	AM	3500
5/7/97	2.0	3600	AM	3520
7/7/97	2.0	3620	AM	3540
9/7/97	2.0	3640	AM	3560
11/7/97	2.0	3660	AM	3580
1/8/98	2.0	3680	AM	3600
3/8/98	2.0	3700	AM	3620
5/8/98	2.0	3720	AM	3640
7/8/98	2.0	3740	AM	3660
9/8/98	2.0	3760	AM	3680
11/8/98	2.0	3780	AM	3700
1/9/99	2.0	3800	AM	3720
3/9/99	2.0	3820	AM	3740
5/9/99	2.0	3840	AM	3760
7/9/99	2.0	3860	AM	3780
9/9/99	2.0	3880	AM	3800
11/9/99	2.0	3900	AM	3820
1/10/00	2.0	3920	AM	3840
3/10/00	2.0	3940	AM	3860
5/10/00	2.0	3960	AM	3880
7/10/00	2.0	3980	AM	3900
9/10/00	2.0	4000	AM	3920
11/10/00	2.0	4020	AM	3940
1/11/01	2.0	4040	AM	3960
3/11/01	2.0	4060	AM	3980
5/11/01	2.0	4080	AM	4000
7/11/01	2.0	4100	AM	4020
9/11/01	2.0	4120	AM	4040
11/11/01	2.0	4140	AM	4060
1/12/02	2.0	4160	AM	4080
3/12/02	2.0	4180	AM	4100
5/12/02	2.0	4200	AM	4120
7/12/02	2.0	4220	AM	4140
9/12/02	2.0	4240	AM	4160
11/12/02	2.0	4260	AM	4180
1/13/03	2.0	4280	AM	4200
3/13/03	2.0	4300	AM	4220
5/13/03	2.0	4320	AM	4240
7/13/03	2.0	4340	AM	4260
9/13/03	2.0	4360	AM	4280
11/13/03	2.0	4380	AM	4300
1/14/04	2.0	4400	AM	4320
3/14/04	2.0	4420	AM	4340
5/14/04	2.0	4440	AM	4360
7/14/04	2.0	4460	AM	4380
9/14/04	2.0	4480	AM	4400
11/14/04	2.0	4500	AM	4420
1/15/05	2.0	4520	AM	4440
3/15/05	2.0	4540	AM	4460
5/15/05	2.0	4560	AM	4480
7/15/05	2.0	4580	AM	4500
9/15/05	2.0	4600	AM	4520
11/15/05	2.0	4620	AM	4540
1/16/06	2.0	4640	AM	4560
3/16/06	2.0	4660	AM	4580
5/16/06	2.0	4680	AM	4600
7/16/06	2.0	4700	AM	4620
9/16/06	2.0	4720	AM	4640
11/16/06	2.0	4740	AM	4660
1/17/07	2.0	4760	AM	4680
3/17/07	2.0	4780	AM	4700
5/17/07	2.0	4800	AM	4720
7/17/07	2.0	4820	AM	4740
9/17/07	2.0	4840	AM	4760
11/17/07	2.0	4860	AM	4780
1/18/08	2.0	4880	AM	4800
3/18/08	2.0	4900	AM	4820
5/18/08	2.0	4920	AM	4840
7/18/08	2.0	4940	AM	4860
9/18/08	2.0	4960	AM	4880
11/18/08	2.0	4980	AM	4900
1/19/09	2.0	5000	AM	4920
3/19/09	2.0	5020	AM	4940
5/19/09	2.0	5040	AM	4960
7/19/09	2.0	5060	AM	4980
9/19/09	2.0	5080	AM	5000
11/19/09	2.0	5100	AM	5020
1/20/10	2.0	5120	AM	5040
3/20/10	2.0	5140	AM	5060
5/20/10	2.0	5160	AM	5080
7/20/10	2.0	5180	AM	5100
9/20/10	2.0	5200	AM	5120
11/20/10	2.0	5220	AM	5140
1/21/11	2.0	5240	AM	5160
3/21/11	2.0	5260	AM	5180
5/21/11	2.0	5280	AM	5200
7/21/11	2.0	5300	AM	5220
9/21/11	2.0	5320	AM	5240
11/21/11	2.0	5340	AM	5260
1/22/12	2.0	5360	AM	5280
3/22/12	2.0	5380	AM	5300
5/22/12	2.0	5400	AM	5320
7/22/12	2.0	5420	AM	5340
9/22/12	2.0	5440	AM	5360
11/22/12	2.0	5460	AM	5380
1/23/13	2.0	5480	AM	5400
3/23/13	2.0	5500	AM	5420
5/23/13	2.0	5520	AM	5440
7/23/13	2.0	5540	AM	5460
9/23/13	2.0	5560	AM	5480
11/23/13	2.0	5580	AM	5500
1/24/14	2.0	5600	AM	5520
3/24/14	2.0	5620	AM	5540
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7/24/14	2.0	5660	AM	5580
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7/27/17	2.0	6020	AM	5940
9/27/17	2.0	6040	AM	5960
11/27/17	2.0	6060		

# ABSTRACT

Cash management is simply defined as making the right amount of money available at the right time and the right place to meet the government's obligations in the most cost-effective way.

The main features of modern cash management are centralized government bank accounts and establishment of a Treasury Single Account, ability to make accurate cash flow forecasts, use of short-term financing instruments, and capacity for the investment of excess cash reserves. Establishing a sound cash management framework with the mentioned features is beneficial not only to the governments and public entities, but also to other stakeholders including the beneficiaries of government payments, banks and lenders. Given the recent COVID-19 pandemic and locked-down measures introduced in many countries, governments had to deal with unanticipated revenue decreases, and significantly increased public expenditures due to fiscal stimulus packages and pandemic related health expenditures. Therefore, existence of a well-structured government cash management is now even more important than before.

This paper aims to explore cash flow forecasting and cash management practices in 24 countries in various regions, at different income levels and technical capacity, and alignment to good practices based on the information provided at the World Bank workshops on Cash Flow Forecasting and Cash Management held in 2018 and 2019. The paper also draws on experiences and practices from other emerging and advanced countries.

Cases from different countries indicate that full implementation of modern cash management is still a challenge, even though the Treasury Single Account system is common in most countries and liquidity buffers were established or increased following the Global Financial Crisis. Cash flow forecasting is an area to improve given the accuracy, horizon and frequency of the projections are frequently limited. Fragmented institutional structure makes cash management even more challenging. Country cases also demonstrate that there is a significant room to strengthen coordination between debt and cash management and the use of short-term instruments to cover cash shortages. Investment of cash balances seems to be a bigger weakness as many countries keep their liquidity buffers in the Central Bank with no remuneration.

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# Abbreviations

CB: Central Bank

CP: Commercial paper

DeMPA: Debt Management Performance Assessment

DPI: Debt Management Performance Indicator

FX: Foreign exchange

GDP: Gross domestic product

GG: General government

IMF: International Monetary Fund

MoF: Ministry of Finance

MTDS: Medium-term Debt Management Strategy

T-bill: Treasury bill

TSA: Treasury Single Account

UK: United Kingdom

USA: United States of America

VAT: Value-added Tax

# MTI INSIGHT

2

LOAN		PAYMENT	
Date	Rs.	Date	Rs.
3/12/17	20	3/12/17	1080
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11/1/40	20	11/1/40	6760
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1/1/41	20	1/1/41	



# Cash Management- How do Countries Perform Sound Practices?

## >> INTRODUCTION

Cash management, as a process of collection, distribution and investment of cash, requires projection of cash flows, a mechanism for payments and revenue collection, short-term instruments to finance the gap between cash flows, capacity to generate a return over cash balances and coordination across institutions. Storkey (2001) defines cash management as having the right amount of money in the right place and time to meet the government's obligations in the most cost-effective way. Williams (2004) further considers cash management as the strategy and associated processes for managing cost-effectively the government's short-term cash flows and cash balances, both within government, and between government and other sectors. The effectiveness of cash management depends on the provision of reliable data and realistic assumptions in cash flow forecasting, consolidation of cash flows through a centralized system of bank accounts, existence of structured and liquid bond and money markets, and well-defined institutional and legal framework.

Lienert (2009) and Williams (2010) identify the main building blocks that countries should look for to establish a sound framework for effective cash management (Table 1).

As Williams argued (2004) efficient cash management increases the certainty of government's payments and reduce operational risks, mismanagement and fraud. It further minimizes idle cash held by government and a direct saving in the form of borrowing that is no longer needed to finance the cash which is unlikely remunerated.

Following the Global Financial Crisis, many advanced and emerging countries have either established (e.g. the United States, Canada, Portugal and Hungary) or strengthened liquidity buffers (Cruz and Koc, 2018). The objective of accumulating cash is to provide a buffer for unanticipated cash outflows and to avoid accessing the market for unplanned short-term financing. However, given that the size of a liquidity buffer is linked to, among other factors, the magnitude of cash flow forecasting errors and cash flow volatility, the design of a strategy for building up a cash reserve reflects the significance of the challenges of accurate cash flow forecasting.

**TABLE 1 - Key Features of Cash Management**

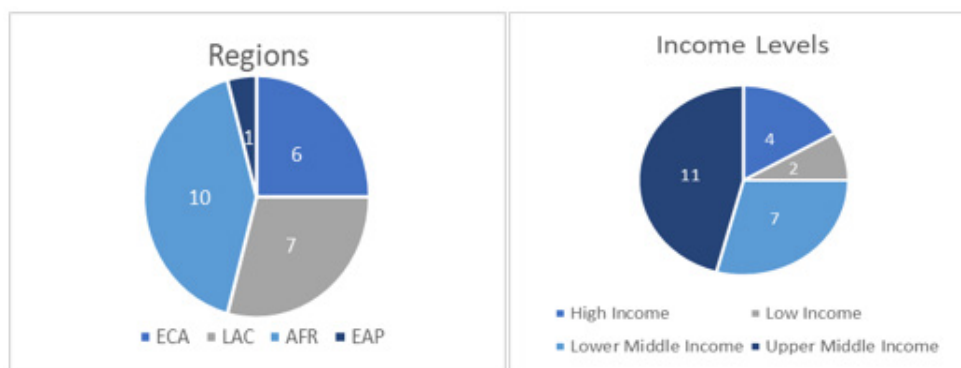
KEY FEATURES OF MODERN CASH MANAGEMENT (LIENERT, 2009)	KEY CHARACTERISTICS OF GOOD PRACTICE IN GOVERNMENT CASH MANAGEMENT (WILLIAMS, 2010)
Centralization of government cash balances and establishment of a Treasury Single Account (TSA) structure	Centralization of government cash balances and establishment of a TSA
Clear understandings on the coverage of the cash planning framework	
Ability to make accurate projections of short-term cash inflows and outflows	Ability to make accurate projections of short-term cash inflows and outflows
An adequate transaction processing and accounting framework	
Timely information sharing between the central treasury, revenue-collecting agencies, spending ministries, and/or treasury branch offices	Information sharing between the cash managers, revenue-collecting agencies and spending ministries (and any relevant branch offices)
Appropriate institutional arrangements and responsibilities	Formal agreement between the MOF and the central bank on information flows and respective responsibilities
Utilization of modern banking, payment and settlement systems	Modern systems: and adequate transaction processing and accounting framework (processing government transactions with few handling steps, reliance on electronic transactions); modern banking, payment and settlement systems
Use of short-term financial market instruments for cash management	Use of short-term instruments (treasury bills, repo and reverse repo, term deposits, etc.) to help manage balances and timing mismatches
Integration of debt and cash management	Strong coordination of debt and cash management

On the other hand, there is a trade-off between the size of the liquidity buffer and the cost of carry<sup>1</sup>, as keeping cash balance has a cost. Therefore, accuracy of cash flow projections and effectiveness of cash management prevent governments to accumulate arrears, help saving cost and mitigate risks. Due to the COVID-19 pandemic, many countries introduced lockdowns and economies faced contraction globally. Therefore, governments' revenues have decreased, and cash outflows increased because of the fiscal stimulus packages and pandemic related health expenditures. Given the increased uncertainty during the COVID-19 crisis, managing the cash in the most effective way has become even more challenging. In this context, lessons learnt from other countries could be extremely useful.

Active cash management allows governments to use wide range of financing instruments which also helps offsetting the cash flows of governments at the central banks and to reduce uncertainty in central banks' liquidity forecasts. Efficient management of cash further contributes to the development of effective short-term securities market (Williams, 2004). However, there are cases where cash management is used for different purposes such as to maintain fiscal controls through a process called "cash rationing" (Miller and Hadley, 2016).

This paper aims to explore cash flow forecasting and cash management practices in countries in different regions, with different income levels, technical capacity and alignment to good practices, based on the information provided by 24 countries that participated in World Bank workshops on Cash Flow Forecasting and Cash Management held in 2018 and 2019. The participating countries were Albania, Angola, Bolivia, Brazil, Chile, Colombia, Equatorial Guinea, Eswatini, The Gambia, Ghana, Honduras, Kosovo, Lesotho, Nigeria, North Macedonia, Peru, Romania, Rwanda, Serbia, Seychelles, Slovenia, South Africa, Thailand, Uruguay. The paper also draws on experiences and practices from emerging and advanced countries such as France, Hungary, India, Portugal, Sweden, Turkey, the UK and the USA.

1. Cost of carry is broadly defined in this paper as the cost of keeping excess of cash in government accounts, given that borrowing cost tends to be higher than the return of the investment of these resources (if any). In a non-strict sense, it could be compared as the opportunity cost of "unused" cash, in net terms.

**FIGURE 1 - Workshop Participants by Region and Income Level**

The paper does not intend to revisit all features of effective cash management already explored in the existing literature, but sheds light on some critical pillars: cash flow forecasting, the use of short-term instruments for closing the cash flow gaps, investment of excess cash, and the coordination between cash and debt management. Practical experiences from a relevant sample of countries not segmented by region or income levels bring up how different approaches may be adopted respecting the specificities, limitations and strengths of each country, but still be aligned with sound practices.

This paper is comprised of four sections as summarized in the following: Section I provides a brief overview of the fundamentals of cash flow forecasting. Section II discusses the funding instruments for financing the gaps between cash inflows and outflows, and the coordination between cash and debt management. Section III examines the practices on the liquidity buffer and investment of excess balance of the TSA. Finally, Section IV summarizes the findings and includes policy recommendations.

## >> I. CASH FLOW FORECASTING

Cash management is a process which aims at making the right amount of money available at the right time in the right place to execute the government's payment obligations. This widely accepted definition seems simple but putting it into practice might be challenging. In case the full amount (right amount) is not transferred, at the required time (right time) to the beneficiary (right place) the government can face with payment arrears and default. This three-legged process can be called as "calibration of 3Rs" where each R represents a "right" for the amount, the place and the time. Finding the "right" balance of 3Rs is like three-ball juggling, and none of the balls should drop anytime. Therefore, it requires a strong cash flow forecasting capacity and the ability to implement cash flow projections.

The main objective of cash management is to minimize gaps between cash inflows and outflows at any point of time, ideally in the next 3 months. To this end, in order to determine the "right amount" for the required payments, cash managers need to project expected revenues and payments, and identify the gaps. Given that the spending agencies need cash almost always immediately, and available resources are typically limited, meeting all the payment requests when asked is

not an easy task. Therefore, cash managers firstly classify the payments considering the priorities and the due dates. This practice helps cash managers to put payment requests in an order and to process to make funds available for the beneficiaries.

### >>> A. GOVERNANCE AND INSTITUTIONAL FRAMEWORK OF CASH FLOW FORECASTING

Cash flow forecasting is key to ensure that government's payment obligations are fully met, and arrears are not accumulated. However, if cash management is not well-positioned in the government's planning and resource management cycle and has weak linkages with debt management, a cash manager will not be able to produce accurate projections of cashflows and cannot provide reliable and timely information to decision-makers, spending agencies, Central Bank and markets. Therefore, as confirmed by sound practices, setting appropriate institutional arrangements and identifying the responsibilities across institutions are essential for effective cash management.

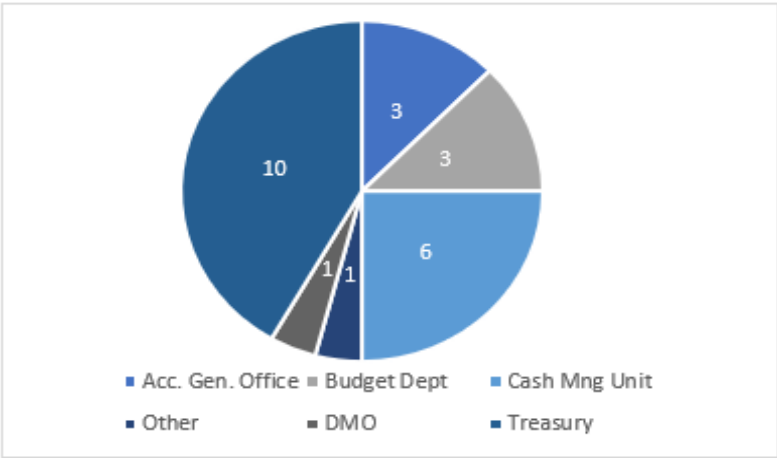
Cash management, as an element of strong public financial management, helps keeping payments within the budget limits, through authorized budget allocations. It can further improve realism of fiscal projections and assist decision-makers to identify corrective fiscal actions. However, cash management is not part of the budget cycle and not a tool to maintain fiscal control.

On the other hand, in countries where budgets are not credible and expenditures cannot be financed within the available resource envelope, governments may change the priorities during the budget execution and enforce a combination of budget revisions, commitment controls and

cash rationing to ensure spending agencies stay within the budget limits and achieve aggregate fiscal targets (Miller and Hadley, 2016). To this end, some countries consider cash management as a part of budget management and position it either entirely (Chile) or only some of its functions (Ghana, Seychelles) within the Budget Department. Besides, some countries carry over cash management fully or partially in the Accountant General's Office (Eswatini, Lesotho, Nigeria). There are also cases where cash flows are projected by other departments (e.g. Macroeconomic Policy Analysis Unit of The Gambia).

> > >

**FIGURE 2 - Principal Entities in Charge of Cash Management in Workshops' Participating Countries**



In a cash rationing environment, spending agencies do not have flexibility to make their own resource planning as allocation of cash is unpredictable, and management of financial resources is highly centralized. This makes it difficult for ministries to plan activities in their sector, with potentially negative impacts on the delivery of public services.

As shown in Figure 2, in most of the assessed countries, cash management is a function of the Treasury and positioned either as a dedicated unit (South Africa, Kosovo, Rwanda) or dispersed across divisions. It is also widely reported that cash and debt management functions are integrated (Colombia, Kosovo, Peru, Romania, Slovenia, South Africa and Thailand). This is indeed parallel to the practices in advanced countries, as demonstrated by a recent survey that integrated cash and debt management is a common practice across the OECD countries (Cruz and Koc, 2018). On the other hand, there is no specific solution which fits all countries. Therefore, institutional arrangements may vary across countries as long as main features of effective cash management are

secured. Clear definition of responsibilities and workflows within and among the entities in charge of cash management, well-organized internal controls and existence of analytical capacity indicate that “appropriate institutional arrangements and responsibilities” are in place as defined by Lienert (2009).

Regardless of the reporting lines, a Treasury Single Account (TSA), where all the government revenues are collected and payments are made, is the main source of actual data for cash managers. TSA is the common practice across countries and given the tax revenues and most expenditures are in local currency, the main account in TSA system is always in local currency. However, there are many cases that countries also have foreign currency subaccounts in the TSA system, mostly for the foreign currency transactions (Albania, Angola and Colombia). Parallel to the general practices, in all countries discussed in this paper, if the TSA is in place, it is in the Central Bank and the main account is in local currency, even when there are TSA subaccount in foreign currency. Countries such as Lesotho and Nigeria recognized the TSA's pivotal role

in cash management and recently established their TSA systems. There are only a few countries that do not have yet a system for a centralized bank account (e.g. Equatorial Guinea) due to, among other reasons, limited capillarity of central bank branches and insufficient payment and process systems. Gradual implementation of a TSA “system” by consolidating government funds in fewer accounts, respecting existing country limitation is advisable.

Although the TSA provides reliable information on the actual cash flows, cash managers still need to collect information from public entities to ensure that cash flow forecasts are consistent with the revenue projections of tax administration and expenditure plans of the spending agencies.

Overall, forecasting of cash flows is a collective effort as in the case of Ghana where four different departments of the Ministry of Finance are involved in the process. In Ghana, Public Expenditure Management Unit of the Budget Division is in charge of cash flow forecasting. The MoF's Fiscal Unit provides fiscal data, the Debt Management Division prepares information on the debt service, and the External Resource Mobilization Division supplies the information on loans and grants. Additionally, Central Bank of Ghana provides actual data for revenue and expenditures and Ghana Revenue Authority provides both actual collection and forecast for revenues. Furthermore, the Controller and Account General's Department projects cash balances of bank accounts. The coordination between these entities is underpinned by the Cash Management and Treasury Management Committees that hold meetings on weekly basis and one generates outputs for the other.

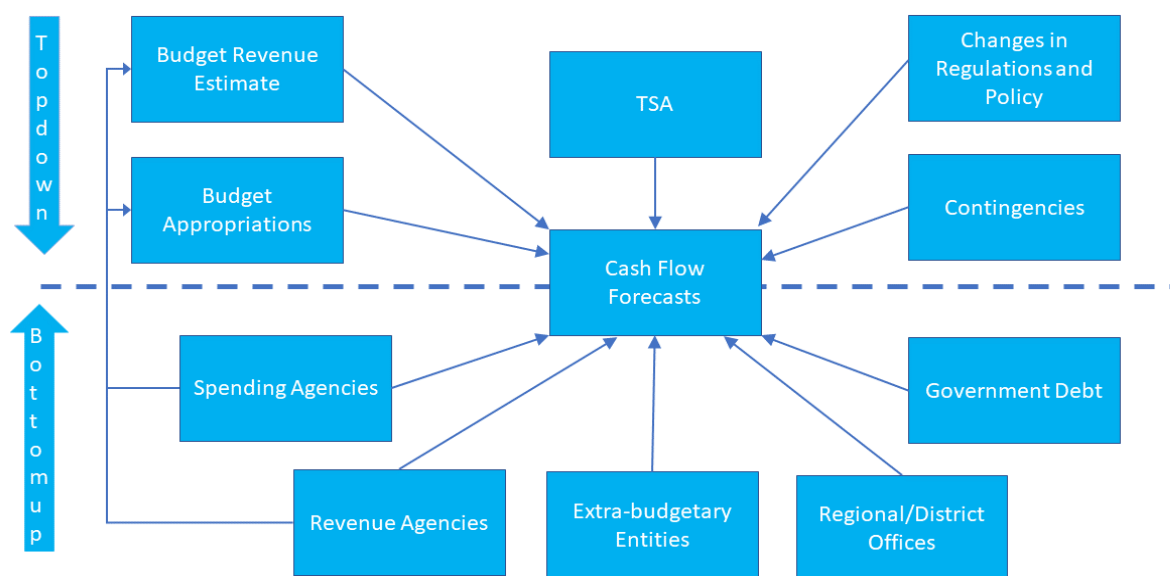
As discussed, there are interactions between cash management, budget execution, debt management and monetary policy, in addition to the tax authority and spending agencies. Therefore, coordination within and across the institutions is essential. On the other hand, in a case where cash management functions are fragmented, coordination becomes more challenging and inefficiencies in organizational arrangements may lead to less accurate cash flow projections. In order to overcome the deficiencies in coordination, many countries have established high and/or technical level committees. To this end, there are countries such as Bolivia, Chile, Ghana, North Macedonia and Romania, where both the MoF and Central Bank are the members of the committee. Besides, there are cases where other government entities are also involved (e.g. Bolivia, Ghana). In countries like Albania, Eswatini, The Gambia and Rwanda, coordination committees are comprised just of the MoF units. Typically, the coordination committees meet monthly, but there are cases where technical

teams meet on weekly basis (e.g. Bolivia, North Macedonia, Ghana).

## >>> B. CASH FLOW FORECASTING PRACTICES

In the absence of cash flow forecasting and planning, governments mostly make the payments in line with the priorities of the political economy, if there is not a sufficiently large cash balance. In such cases, inefficient allocation of financial resources may result in over or under borrowing that can also lead to increased costs and risks. Lack of accountable and predictable mechanism for the allocation of cash may cause credibility gaps and make government funding more challenging. On the other hand, in cases where comprehensive and accurate cash flow forecasting is in place, cash management ensures required funds are transferred to the beneficiary's account at the right time. Along with the methodology applied to forecasting cash flows, the coverage, time horizon and frequency of forecasts are also critical to find the right balance of 3Rs, as discussed above.

The Government's budget is an output of broader national policy processes and includes directives and limits for the collection and allocation of public resources. The strategic budgeting phase involves government institutions such as finance and planning ministries, sector ministries, large spending agencies and other entities like the civil society groups. Based on the strategic directions set at the policy level, budget officials prepare the formal budget which includes estimated revenues and expenditures for each budget entity. Considering that the government budget provides information on the size of the revenues and expenditures and about the public entities entitled for these transactions, as the first step, a cash manager produces an annual cash flow plan based on the budget. This process is simply an application of a top-down approach: (i) review aggregate budget figures (ii) conversion of data from budget to cash-base, (iii) generation of monthly, weekly and daily cash flow forecast with application of analytical models on the historical TSA data, (iv) incorporation of possible changes in government policy and regulations which may affect the collection of revenues and use of public resources, (v) addition of contingencies (Figure 3).

**FIGURE 3 - Cash Flow Forecasting Approaches: Top-down vs. Bottom-up**

Source: Authors

The main output of cash flow forecasting is accurate daily forecasts for at least one month ahead, preferably for the next three months. However, the granularity of the budget data and their frequency do not allow the cash manager to determine the exact time of cash inflows and required time of the payments. Therefore, in order to find the right balance of 3Rs and produce reliable forecasts, cash managers combine the top-down approach with a bottom-up approach. Given that revenue and spending agencies may provide firsthand information and are better positioned to set the priorities for individual transactions, cash managers can obtain from them day by day information through bottom-up approach. Furthermore, the coverage of the government budget may be limited in some countries, especially where the size of extrabudgetary funds/entities are significant and cash managers should obtain missing information directly from these entities, if they are within TSA or under the mandate of cash management.

Another channel to collect information in the bottom-up approach is the local offices/cashiers that may contribute to the accuracy of the projections. Considering that the size of the debt is substantial in many countries, government borrowing, and debt service may significantly change the cash flows in local and foreign currency. Therefore, incorporating public debt, expected calls for state guarantees and guarantee fees is also an essential part of the bottom-up approach.

## >>> COVERAGE OF CASH FLOW FORECASTS

Cash management is part of the public financial management process and directly affected by the effectiveness of budget planning and execution. In principle, expected revenues and expenditure ceilings of central government agencies set in the government budget are the main inputs of cash flow forecasting. On the other hand, it is a fact that in many countries, in particular in the developing and emerging countries, the coverage of state budget could be limited, because public funds are utilized through extrabudgetary funds (e.g. Vietnam<sup>2</sup>) and/or earmarked accounts (e.g. Ghana, South Africa<sup>3</sup>). However, in case that these entities/accounts collect and spend public resources through Treasury bank accounts, they should be included in the cash flow forecasts even if they are not covered by the budget.

The scope of the TSA is critical to determine the coverage of cash flow forecasts and cash management, which is the central government in most countries. However, depending on the decentralization of government, and the compliance of accounting and control systems, the scope of cash management (and of the TSA) can be extended from central government to general government level (e.g. France).

2. IMF Fiscal Monitor, April 2020.

3. Cashin, C., S. Sparkes and D. Bloom (2017).

In principle, State-owned enterprises (SOEs), in particular the public banks and financial institutions, are considered as accountable to their boards and financially independent. Therefore, in government cash flow forecasting only the capital transfers to the SOEs and dividend payments to the government are taken into account. On the other hand, in case an SOE undertakes any functions of government or is designated as a government unit and/or included in the budget, the cash manager needs to include the SOE's financing need in the cash flow forecasts. (See intra-government borrowing in Box 5 for the possible role of SOEs in deficit financing.)

According to the IMF's Government Finance Statistics Manual, debt interest payments and debt service fees are considered as above-the-line items, and debt principal payments are not included in the budget. However, in cash flow forecasting, cash managers need to be sure that all debt related above-the-line and below-the-line items are taken into account.

Contingent liabilities, such as loan guarantees and commitments of public-private-partnership contracts, are classified as off-budget items. These liabilities are monitored by most countries, and paid by the government, when called. In order to avoid any default due to unanticipated payments, potential calls from the contingent liabilities should be included in the cash flow forecasts.

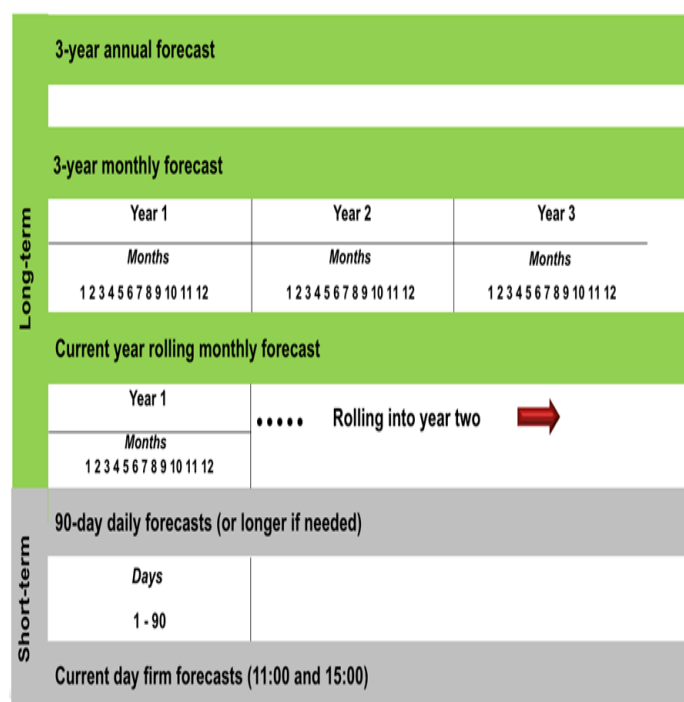
### >>> HORIZON AND FREQUENCY OF FORECASTS

Multi-year budgets have become more common and may provide a longer-term horizon for cash flow projections. However, even for the countries with multi-year budgets, the annual budget that is formally approved by parliament, is still the key document. Accordingly, with some exceptions, the horizon of cash flow forecasts is not going beyond one year. On top of budget estimations, cash flow forecasting and cash management are affected by a number of factors such as the means of payments (e.g. cash, cheque, electronic payments), the payment agents (e.g. Central Bank, commercial banks), the cash management capacity of central government and local government institutions, and the depth and liquidity of government bond and money markets (Miller and Hadley, 2016). Therefore, both horizon and frequency of cash flow projections rely on different parameters and show significant variances across countries. There are countries (e.g. South Africa, Albania) preparing cash flow forecasts for 3-years, yearly, monthly, weekly and daily periods, but on the other side, there are cases where only monthly cash flow forecasts are in place (e.g. Angola, Nigeria). Most of the countries are preparing

yearly cash flow projections with different frequencies such as monthly (Kosovo) weekly (Seychelles) and daily projections (Bolivia, Colombia, Honduras, North Macedonia, Uruguay). In parallel, the periodicity of the revisions of cash flow forecasts differs across countries. In most cases the projections are reviewed and revised weekly or daily. However, there are countries revising the forecasts just monthly.

### >>> BOX 1 - EXTENSIVE CASH FLOW FORECASTING: SOUTH AFRICA

Extended cash flow forecasting enables South Africa to ensure that government manages its cashflow to have sufficient cash to meet its obligations; to neutralize the impact of government's cash flows in the liquidity of the financial system; and to maximize returns on surplus cash. One of the objectives of extended cash flow projections is to ensure there are no large and unpredictable changes in liquidity in the banking system and monetary policy is not undermined.



Source: National Treasury

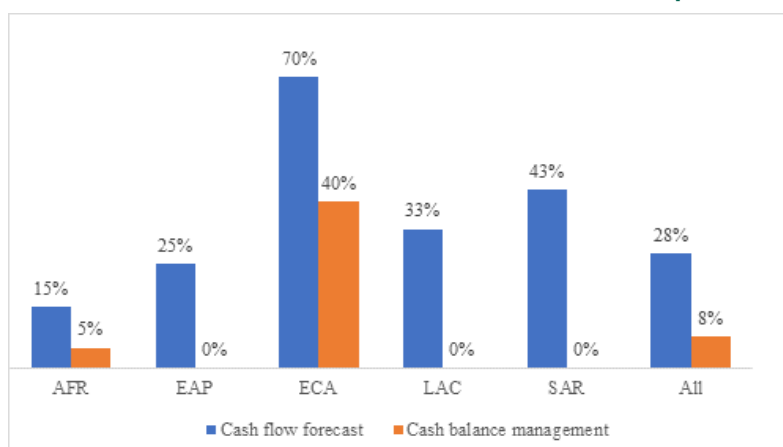
In the cash flow projections, National Treasury forecasts revenues, expenditures, domestic and external debt redemptions, financing of borrowing requirements and the resulting change in cash balances for 3 years with different frequencies, as shown in the figure above.

The Debt Management Performance Assessment (DeMPA) tool of the World Bank evaluates the reliability, horizon and frequency of cash flow forecasting, through Debt Management Performance Indicator (DPI) 11.1<sup>4</sup>, which requires monthly forecasts for getting Score C, weekly breakdowns for score

B and daily estimates for Score A, the highest. As of end-2019, DeMPA assessments have been implemented in 80 developing countries, and only 28 percent of them met the minimum requirement or above (Figure 4, blue bars).

> > >

**FIGURE 4 - Share of DeMPA Assessed Countries that Reached Minimum Requirement (Score C or Above)**



Source: WB DeMPA Reports

As prescribed by DeMPA methodology, countries should ideally prepare daily cash flow forecasts, but even when the breakdown of the estimates is monthly (minimum requirement), it is advised to cover the budget year (horizon). On the other hand, given the budget figures may not be available yet closer to the end of the fiscal year, cash managers should have the capacity to estimate the cash-flows for the initial months of the following budget year.

## >>> REVENUE FORECASTING

It is the common practice to forecast revenues through the application of a top-down approach considering that (i) main tax items (e.g. income tax, corporate tax and V.A.T.) and customs' tax and duties comprise the significant part of total collections, which for good estimates is provided by the annual budget's tax projections, (ii) revenues have strong seasonality and it is practical to generate monthly and weekly breakdowns from annual budget figures by using historical data, and (iii) it captures necessary adjustments due to the changes in government policy and regulation, macroeconomic and financial developments. Accordingly, in most countries, cash managers rely on the projections of the tax administration. On the other hand, there are cases where revenues are projected by the cash management unit (Peru), the fiscal policy office (Thailand), or the macroeconomic forecasting unit (Seychelles).

For the revenues other than tax and customs, such as dividends, grants and receivables from on-lent loans, the best way to produce forecasts is to apply bottom-up approach which refers to the collection of information from relevant institutions as the granularity is not the same and individual flows can be followed.

4. <http://www.worldbank.org/en/topic/debt/brief/dempa-2015>

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## >>> BOX 2 - PERU'S CASH FLOW FORECASTING MODEL

Peru employs a quantitative approach to build the financial programming of the TSA based on cash flow projection scenarios. As the first step, the cash inflows are classified into five categories as the following, which are later projected through different models:

- Ordinary Resources (e.g. taxes)
- Determined Resources
- Donations and Transfers
- Directly Raised Resources
- Resources for Official Credit Operations

Ordinary resources (tax collections) are projected by using econometric time series models while other revenue sources are forecasted by applying moving averages and growth rates.

Similarly, expenditures are put into categories according to their types (e.g. generic expenditures such as salaries, pensions and other social benefits, and goods and services, current spending, capital spending). Expenditures financed by Ordinary resources are projected using time series econometric models. Other expenditures types are projected using moving averages, growth rates and schedules.

*Source: Ministry of Economy and Finance of Peru*

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## >>> EXPENDITURE FORECASTING

Given that the government budget imposes expenditure ceilings through appropriations, and the nature of non-discretionary expenditures is quite predictable, cash managers are relatively more comfortable for expenditure forecast. However, considering the time lags between the release of appropriations and actual payments from the TSA, cash managers tend to rely more on the historical TSA data in the expenditure forecasts. Besides, historical data, and the laws and regulations may also provide useful information on the payment dates of regular and large transactions.

Discretionary expenditures (e.g. goods and services, capital expenditures, subsidies and transfers) are prone to government policy decisions that makes them harder to forecast. Therefore, it would be more efficient to concentrate on major projects and programs which require large payments, rather than aiming to forecast all expenditures. On the other hand, in most countries, linked to the budget appropriation's release calendar and due to the budget's spend-it-or-loose-

it policy, discretionary expenditures, in particular the goods services and capital expenditures, show a strong seasonality due to the weak performance at the beginning of the year and, on contrary, high spending in the last few months.

Due to the fact that cash managers cannot know the physical conditions of the infrastructure investments and are not able to assess the best time the goods and services are needed, sector-ministries and spending agencies are the best resources to provide information for the projection of discretionary expenditures which refers to a bottom-up approach.

Although the quantitative analysis and spending agencies' inputs are at the core of expenditure forecasting, qualitative judgments contain additional information that cannot be incorporated into the models. They allow cash managers to adjust forecasts considering the reliability of data collected from different sources and the counterparts' forecasting performance.

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## >>> BOX 3 - A TOOL FOR THE IMPLEMENTATION OF BOTTOM-UP APPROACH: TURKEY'S CASH REQUEST SYSTEM

In 2011, Turkey introduced a web-based portal to collect data from the public entities on a real-time basis. More than 200 users submit information through the system with different frequencies:

- Sector ministries and other spending agencies: submit their expenditure plans, and expected revenue collections every month with a daily breakdown, considering the released budget allocations. Public institutions are asked to identify their requests in a few categories. Projections may be revised on a weekly basis, during the month.
- Regional and central accounting offices: report pending payment orders submitted by the accrual departments of sector ministries and other spending agencies on daily basis.

Treasury's cash management unit extensively uses this data, in particular when forecasting daily breakdown of monthly cash flows.

*Source: Ministry of Treasury and Finance of Turkey*

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## >>> INCORPORATING DEBT DATA

Debt interest and principal payments are significant elements of cash flow forecasts, along with the cash inflows from the issuance of new debt. It is a common practice that debt managers provide cash flow projections related to debt service and borrowing. In addition, cash managers commonly coordinate with debt management office to collect information on the contingent liabilities in case they may materialize.

Cash flow forecasts associated to floating, inflation-linked, foreign-currency denominated or any other variable debt need to be estimated using macroeconomic scenario(s) that not necessarily (or commonly) are produced by debt managers (a third party usually generates the required estimates, e.g. Central Bank or macro unit at MoF). Shock scenarios can be useful when defining a liquidity buffer policy, as it is also the case on the design of a Medium-Term Debt Management Strategy (MTDS).

## >>> ACCURACY OF FORECASTS

Producing reliable and accurate cash flow forecasts is crucial for public financial management policy setting and implementation through (i) providing critical information to decision making to take corrective fiscal actions, (ii) avoiding accumulation of arrears and (iii) minimizing cost of carry.

There are factors that create deviations between the initial forecasts and actual figures, such as external events, change in government policy, or lack of information. In order to eliminate some of these factors and improve accuracy of cash flow forecasts, countries introduce monitoring mechanisms and preventive actions. Real time monitoring of TSA balance allows cash managers to assess the performance of cash flow forecasts, but strong electronic banking/payment infrastructure is a prerequisite. More realistic budget projections, sensitizing the line ministries on the cost of forecasting errors and mitigation measures such as developing more coercive framework to prevent unexpected large payments help improve accuracy of forecasts.

Forecasting deviations from actual cash flows should be frequently reviewed in order to improve the accuracy of the projections and help cash managers understanding the sources of errors. To this end, it is useful to keep a repository of historical forecast data that enables granular analysis of the deviations throughout different periods of the year and time lags between estimated and realized cash flows. Just 9 out of the 24 workshop participating countries presented

numbers of the accuracy of their forecasts, indicating that thorough assessment of estimates performance has not been extensively done in most of these countries and pointing out to a possible area for improvement.

A liquidity buffer, discussed in detail in Section III, is a useful tool to deal with deviations between the projections and realizations. Buffers ensure that an amount of cash is available to meet unexpected changes in cash flows (lower revenues or higher expenditure compared to the forecast) so that the cash manager can still be able to fulfil projected obligations at due date.

## >> II. FINANCING CASH FLOW GAPS

Robust cash balance estimates are a pre-condition for governments to undertake necessary actions to ensure that obligations will be met on time, while borrowing resources (and cost) are limited to what is indeed needed, avoiding unnecessary borrowing.

Ensuring the availability of required resources to finance the budget expenditures/deficit and meeting debt obligations with a cost-and-risk minimization approach, is a common objective of debt and cash management. The main difference resides in distinct time horizons targeted by cash and debt managers.

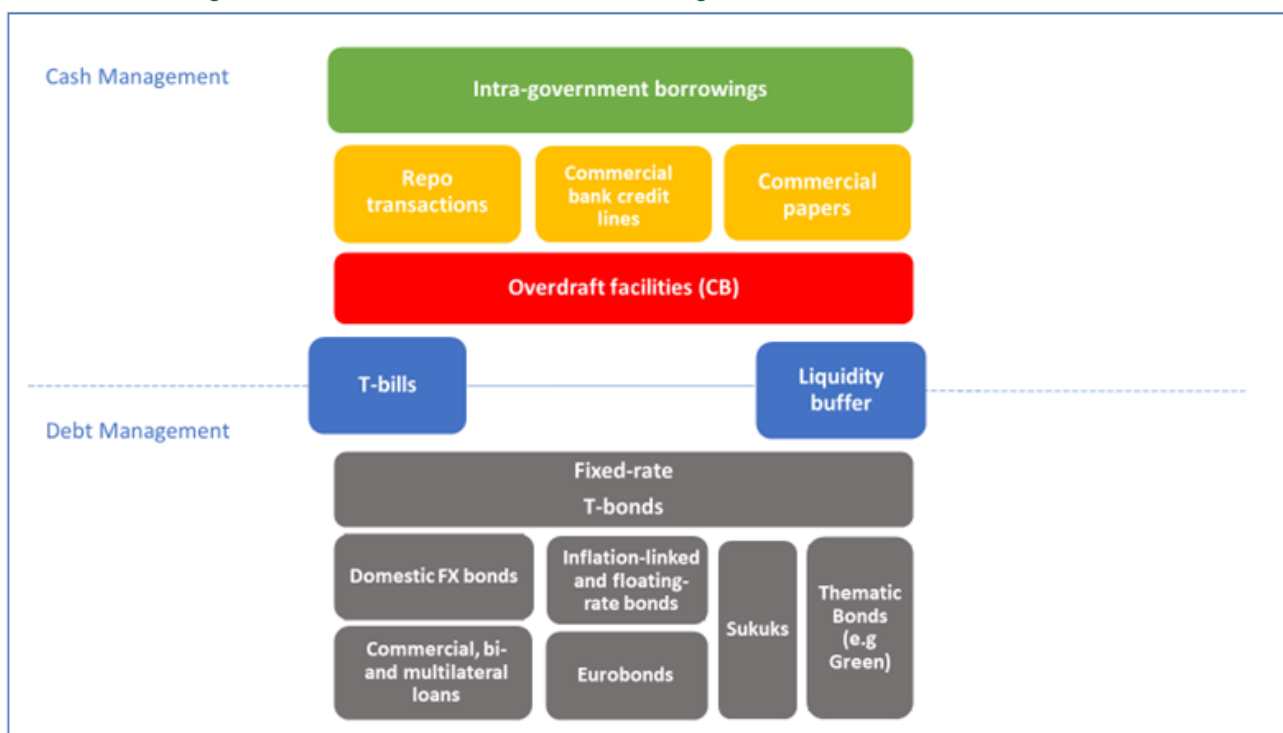
Cash balance management encompasses two main tasks: i) raising funds to cover cash shortages; and ii) investing cash balances to minimize the cost of carry. The government will float from one side to the other depending on its current and

expected cash balances (shortage or excess), and the cash flow forecasting underpins both tasks. One may argue that the main connection between cash and debt management can be seen on the use of short-term instruments to cover temporary lack of cash, which is true. Nonetheless, it is worth noting that investing cash will just make sense when government is not borrowing, given the cost of carry.

The choice of instruments to be used to cover temporary cash shortages is dependent on the expected period for the cash imbalance and associated costs. The chart below shows the funding instruments used by governments for cash and debt management, while demonstrates how T-bills and the liquidity buffer stand in the intersection and well serving both activities<sup>5</sup>.

> > >

**FIGURE 5 - Funding Instruments for Cash and Debt Management**



Source: Authors

5. Commercial papers may also be used for debt management, although are more commonly applied to solve short-term cash imbalances (cash management).

## >>> A. FUNDING INSTRUMENTS

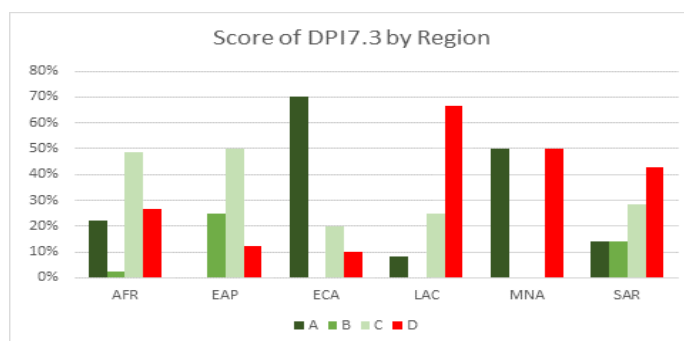
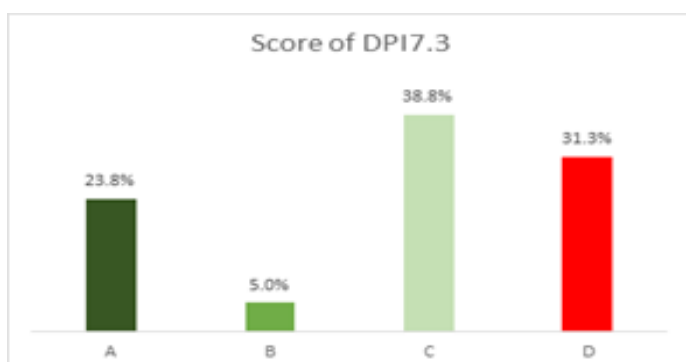
Temporary cash shortages can be covered by cash managers through a variety of instruments illustrated in Figure 5 and explained in the following:

**Overdraft facility:** The Central Bank provides a short-term credit line (also referred as advances) usually with volume and time caps (used, for instance, by Eswatini, India and Uruguay). Many developing and developed countries has limited this practice to avoid inflationary and foreign currency spillover effects due to the financing of central government by the monetary authority (Brazil and Chile banned any Central Bank financing at the constitutional level). However, more recently, monetary financing has been extraordinarily used by several countries under less constrained framework than what it ideally should be<sup>6</sup>, due to the governments' increasing cash needs resulted from the COVID-19 crisis (see Box 4). When available to the government, the overdraft facility tends to be one of the most flexible instruments, but with possible drawbacks in terms of cost and volume cap.

### >>> BOX 4 - CENTRAL BANK FINANCING TO GOVERNMENTS

While monetary and fiscal policies bring undeniable interlinkages, separation between Central Bank mandate and government financing needs to be in place to avoid undesirable interferences on the implementation of each policies and support fiscal discipline.

Jácome et. al. (2012) show that in a sample of 152 countries, 57 permit the use of advances, while 40 allow the use of credit (loans) and 51 set prohibition to any kind of credit. Results from DeMPA assessments carried out in 80 countries as of end of 2019 also point out the need of narrowing the conditions in which government can directly borrow from the monetary authority.



Almost one third of the assessed countries don't impose a legal ceiling for direct borrowing from the Central Bank (score D), which is the minimum requirement for score C under DeMPA. On the other hand, slightly less than one fourth of the countries legally prohibit or limit the monetary financing to emergency situations and to periods not longer than two weeks (score A). Besides, the approaches significantly vary across regions: majority of the countries in Latin-America does not get the minimum score, while more than two third of the European and Central Asian countries have obtained the highest score in the latest assessments.

As a response to the Global Financial Crisis, the Federal Reserve (USA), the Central Bank of Europe and the Bank of Japan have provided liquidity to the bonds holders (including banks and institutional investors) by purchasing government securities in the secondary market, to achieve financial markets' stability. In this case, the Central Banks' objective was not to support the coverage of short-term cash imbalances of governments, as targeted by the overdraft facilities. However, more recently, with the increased financing needs related to the COVID-19 pandemic, some countries have authorized Central Banks to finance governments directly through the purchase of government securities in the primary market, and to support the bond holders in the secondary market (See Arslan, Y, Drehmann, M and Hoffmann, B (2020)).

The Central Banks in Indonesia, Thailand and Malaysia have bought government securities in the primary market, while the monetary authority has been the buyer of the bonds in the secondary market in Chile, Colombia, Hungary, India, Israel, Korea, Mexico, Philippines, Poland, Romania, South Africa, Turkey and Malaysia (Brazil and Czech Republic requested amendment to the law to be able to do so). The Central Bank of Philippines has also recently established repo transactions between the Bank and the Bureau of the Treasury to cope with temporary cash imbalances associated to the crisis.

Source: [DataViz](#)

6. The WB Debt Management Performance Assessment (DeMPA) scores countries in its Development Policy Indicator – DPI 7.3 (Extent of the limit of direct access to financial resources from the Central Bank) according to the imposition of ceilings on the volumes and tenor, getting maximum score the countries who prohibit the direct financing or limit the advances to emergency situations for periods not longer than two weeks. Red color for the overdraft facilities in Figure 5 represents the emergency character of these instruments, ideally not used on regular basis for government financing.

**Repo transactions:** These transactions are defined as the temporary sale of a (government) security associated with the seller's commitment to purchase it back, after a pre-defined period and on a pre-agreed price. Governments use repos to cover temporary cash shortages by delivering a government security to the lender. Repos provide good flexibility and, in most cases, are used for periods not longer than the time span between T-bills auctions. Interest rates and tenors are negotiated by the counterparts, commonly under a Global Master Repurchase Agreement<sup>7</sup>. The advantage of these transactions for the lender is to receive a collateral (government security). Although the credit risk of the collateral is the same as of the borrower (the government), the provision of a tradable security mitigates the liquidity risk of the lender. Therefore, repo transactions are less costly compared to uncollateralized (“unsecuritized”) borrowing. Several countries use repo operations for temporary borrowing, including Hungary, France, Sweden, USA and UK. Despite of the usefulness of the repo transactions for cash management purposes, countries with less developed cash management practices and shallower money markets, mostly rely on the issue of T-bills for covering cash shortages. Williams (2010) refers to the use of repo transactions as one of the “fine-tuning” mechanisms of cash balance levels, while most of the emerging economies adopt a “rough-tuning” approach. Finally, it is important to consider the way these transactions are captured in debt statistics to avoid underestimations that may affect monetary and fiscal policies and rules, given the repos can be used by treasuries to cover cash shortages, and by central banks for drying-up financial system liquidity.

**Commercial banks credit lines:** Unsecuritized direct borrowing from commercial banks under bilateral arrangements is an option for countries with less developed financial markets. This instrument is simpler, but typically costlier compared to securitized transactions. Commercial bank credit lines have a high degree of flexibility in terms of tenors, but they may be constrained by exposure limits to the government<sup>8</sup> and there are some concerns about the instrument transparency. It tends to be used just for very short-term and emergency needs. Romania and Equatorial Guinea keep commercial bank credit lines in their menu of cash management tools.

**Commercial papers:** These money market instruments are usually issued by corporates and financial institutions to manage their cash position, for maturities up to one year, similarly to T-bills for governments. However, some governments also issue commercial papers (CP), mostly denominated in USD and EUR, for cash management

purposes, either to cover FX or local currency gaps. The main benefits are the standardization and depth of the large CP markets in the US and Europe. Issuances are done under a ‘program’ arranged with a few commercial banks, that reach out to investors. The program mentions the range of maturities, the maximum volume that can be issued, technical conditions (settlement, payment days, etc.), leaving the issuer with a lot of flexibility to issue when needed through tap issuances (private placements). CP programs are popular with European DMOs (including Austria, Belgium, Denmark, Ireland, Italy, Netherlands, Sweden), both in EUR and USD, as a way to diversify the investor base at the short end of the curve. It may also be used, in a smaller extent, for debt management.

**Intra-government borrowing:** Governments have been expanding their sources of short-term funding either through pooling government resources beyond the central government in the TSA, or by establishing specific borrowing mechanisms to access resources of local governments, state-owned enterprises and public funds. Intra-government borrowing mechanism mitigates unnecessary government borrowing from the market by matching public entities that have cash shortages and cash surpluses.

7. For further details see <https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/repo-and-collateral-markets/legal-documentation/global-master-repurchase-agreement-gmra/>.

8. Prudential regulations usually require that lenders allocate capital once the credit line is established, even if it is not used.

## >>> BOX 5 - INTRA-GOVERNMENT BORROWING: MAKING BEST USE OF GOVERNMENT FUNDS

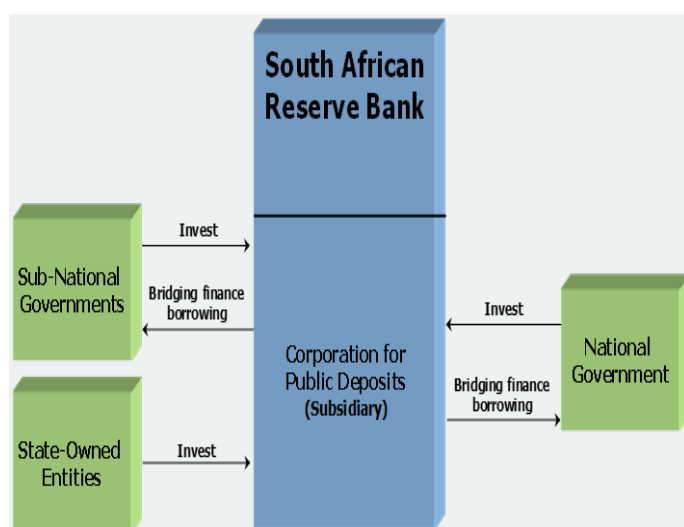
An expanded use of general government (GG) resources may go beyond of just making the best use of available pooled cash in the TSA but providing a borrowing mechanism outside of financial markets which has specific governance arrangements. It rarely includes the full extent of entities encompassed in the GG (some SOEs or public banks which require financial and governance independence and access to capital market usually stay outside of this arrangement). Given that this kind of mechanism expand the reach and the size of “government balances” and reduce the need of market borrowing operations, the inflows and outflows in the financial system will be smaller, potentially facilitating Central Banks’ task on mopping-up or injecting liquidity in the system through monetary policy transactions.

**France** – TSA, held at Banque de France, is composed by approximately 5,000 government accounts including the Treasury Correspondents. These correspondents include local and regional governments and government-funded institutions, as well as external entities such as the European Union which deposits some of its funds with the French Treasury. The main objective of this centralization is to provide an additional funding source to the government and reduce the size of the funding operations in the markets. To enable the Agence France Trésor to cope with thousands of daily transactions coming from multiple account holders, besides robust daily cash flow forecast, Treasury Correspondents are required to notify the Treasury until not later than 4pm for any transaction larger than EUR 1 million expected in the following day.

**Portugal** – the Credit Public and Treasury Management Institute (Instituto de Gestão da Tesouraria e do Crédito Público - IGCP) is authorized to issue Special Certificates of Public Debt (CEDIC) in its integrated mandate of debt and cash management. These certificates represent an intra-government borrowing mechanism for administrative public sector entities and enables public sector corporations investing their excess of cash. The security aims to foster the “integration, the optimization and flexibility on public debt management and excess of cash of public entities”. To provide flexibility to IGCP and investor entities, certificates can be amortized before original maturity dates (12 months) upon agreement between the parties and can be traded between depositary entities as well. Interest rates are determined by the Institute based on inter-bank money market rates.

**Colombia** – government short-term funding is expanded beyond T-bills issuance (both for debt and cash management) by the use of: i) special funds; ii) resources from oil royalties fund; and iii) resources of state entities that are part of the TSA. Special funds gather resources mostly for investment projects and Treasury can temporarily use them as a short-term funding source (amounted USD 8.1 billion at end of 2019). Resources from oil royalties (Sistema General de Regalías) also serve to cover temporary cash shortages (USD 5.9 billion on Dec 2019). To make use of these two funding sources and of resources already allocated for specific state entities within the TSA (item iii), Treasury issues promissory notes (pagares) with market-based rates (interbank and government securities interest rates).

**South Africa** – TSA is held at South African Reserve Bank who outsources to its fully-owned subsidiary (Corporation for Public Deposits – CPD) the task of investing excess of cash. The resources to be invested come from the national government, provincial governments, and state-owned corporations (SOCs). Subnational entities and selected SOCs are required to invest their surplus cash with CPD, while national government uses these funds for debt and, mostly, cash management. In 2018/2019 more than 70% of the daily average balances maintained at CPD was borrowed by the national government. Provincial governments can also borrow from this pool of funds to finance short-term cash imbalances, under predefined limits.



## >>> BOX 5 - INTRA-GOVERNMENT BORROWING: MAKING BEST USE OF GOVERNMENT FUNDS (CONT.)

**Peru** – The General Directorate of Public Indebtedness and Treasury has been annually publishing the 3-year “Strategy for Global Asset and Liability Management” since 2013. It identifies the full scope of assets and liabilities of the Non-Financial Public Sector and, among other objectives, it is meant to improve the centralization of the resources in the TSA. On the assets side, out of a total amounting 16% of GDP in July 2018, i) 3.4% relates to Public Treasury Own Resources, ii) 3.7% is represented by Funds, Allocated and Committed Resources, iii) 4.5% by Resources of Public Entities in the Private Financial System and iv) 3.6% by Resources of Public Entities in the Public Treasury. While ii) and iii) are mostly earmarked resources, iv) represents an additional source of temporary funding, mostly found in the TSA.

*Source: Debt Management Offices/Agencies websites and country cases presented in the WB Cash Flow Forecasting and Cash Management Workshops (2018 and 2019).*

**T-bills:** These are the zero-coupon securities with assumed maturities from weeks up to 1 year. As shown in Figure 5, T-bills are used both by cash and debt managers. For cash management purposes, T-bills may be issued under a flexible approach, not necessarily through regular issuances, offered amounts defined according to immediate cash needs and tenors determined by the length of the expected cash shortages<sup>9</sup>. On the other hand, T-bills are one of the main instruments for debt managers either to deal with debt cost-and-risk trade-off<sup>10</sup> or cope with large financing needs in the absence of a diversified investor base (concentrated in commercial banks).

## >>> B. COORDINATION BETWEEN CASH AND DEBT MANAGEMENT

As mentioned before, T-bills serve two different purposes: i) refinance the debt, especially in countries where the investor base is highly concentrated in banks<sup>11</sup>, and therefore the demand for public debt instruments is limited to short-term tenors (matching banks' liabilities length); and ii) cover temporary cash shortages. Given that in the latter financing needs are temporary, it is expected that the stock of T-bills

remains fairly constant between years, but with important variations within the year. On the other side, when T-bills are mostly used for debt management purposes, changes in the outstanding can be expected depending on investors' appetite (demand) and what is defined in the MTDS (supply).

Looking at the dedicated debt management instruments, fiscal gaps are mostly closed with the issuance of T-bonds (longer than 1 year), while T-bills are used for temporary cash imbalances. However, even in countries where T-bills are labeled or segmented as cash management instruments (see Box 6), flexibility is granted to enable debt managers to undertake tactical approach to shorten and lengthen the debt portfolio according to market conditions, issuing more or less T-bills in a period than in another. While this is more commonly seen for developed markets where the investor base is diversified, and long-term funding is possible, countries with underdeveloped markets rely more on T-bills for fiscal gap closing.

To avoid unnecessary borrowing cost beyond the period of a cash shortage, ideally a new security with a specific tenor (matching the extension of the cash shortfall) would be issued. As shown in Box 6 below, countries' approaches vary, as some opt to use a more flexible set of instruments for cash management (France, Hungary, India, South Africa) while others stick to T-bills with maturities mostly in 3, 6 and 12 months (Albania, Brazil, Colombia, Ghana, North Macedonia, Romania and Rwanda).

It's worth noting that even in countries that adopt more flexible short-term instruments to fund temporary cash shortages, T-bills maturing in 3, 6 and 12 months are also regularly issued (India has T-bills and Cash Management T-bills and France and Hungary specify T-Bills as an instrument for cash management purpose). These standardized T-bills not only give flexibility to cash and debt managers to raise fund, but also serve as tools to develop price reference in the short end of the yield curve. There are countries where this function is mainly performed by the issuance of short-term bills by the Central Bank (Chile<sup>12</sup>, Honduras). In other countries T-bills have been issued by debt management offices as a part of regular issuance program to maintain reliable price references for the represented tenors, besides debt and cash management traditional objectives (Brazil, Colombia, Turkey).

9. Investors don't request the same level of predictability compared to longer-term instruments.

10. Even countries with wide access of long-term funding use T-Bills to shift the issuance and portfolio profile, temporarily shortening them to avoid excess cost when yield curve slope is uncommonly steep.

11. The demand from banks for T-bills is also limited by their liquidity and regulatory needs, reinforcing the need of diversifying the investor base with the incorporation of final investors' demand.

12. Chilean Government has recently started to issue 6- and 12-months T-Bills to cope with the increased borrowing needs related to the COVID-19 crisis and “to improve the liquidity and depth of the domestic fixed-income market in the short end of the curves” (Investors Relations Presentations – April 27th, 2020), but no short-term instruments are issued for cash management purposes.

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## >>> BOX 6 – SELECTED EXAMPLES ON THE USE OF T-BILLS FOR CASH AND DEBT MANAGEMENT

**France** – T-Bills (BTFs - Bons du Trésor à taux fixe) are exclusively used for cash management purposes, i.e., “smoothing out fluctuations in the government’s cash position over the course of the year”. Weekly auctions of 3-months BTFs are carried out, while 6-months and 1-year T-bills are used less frequently as longer cash flows imbalances may require. On the other hand, greater flexibility is provided to cope with unexpected shorter-term cash shortages, by the possibility to issue shorter BTFs commonly maturing from 4 to 7 weeks.

**Hungary** – “Discount T-bills” maturing in 3 and 12-months are used for liquidity management, i.e. for smoothening the fluctuation in the liquidity caused by varying financing requirements over the year. “Liquidity discount treasury bills” of shorter tenors (usually 6 weeks) alongside with the use of repo transactions complement the tools used for funding temporary cash imbalances.

**India** – Cash flow mismatches of the central government are managed through the issuance of T-Bills, Cash Management T-bills and access to the Ways and Means Advances (WMA) facility from Reserve Bank of India. T-bills are issued for fixed tenors of 91, 182 and 364 days, while Cash Management T-bills and WMA grant greater flexibility for the government. The latter can be used for up to 90 days, charges market (repo) rate and are also extended to local governments.

**South Africa** – T-bills maturing in 6, 9 and 12 months are issued weekly as part of debt management strategy, while similar instruments maturing in 3 months or less are used for cash management purposes.

**Colombia** – T-bills with a reference maturity of 12 months are weekly issued to finance treasury operations (part of cash management instruments). Instruments with fixed maturity dates (due dates in March, June, September and December) are issued during a quarter (reopenings). Therefore, T-bills tenors varies from 12 to 9 months, depending on the issuance date. T-bonds issuances are held in different days of the weeks, less focused (but integrated) on cash needs, and more on debt refinancing.

**Brazil** – T-bills maturing in 6 and 12 months are weekly issued on alternated basis through reopenings – actual tenors range from 12 to 9 months, and from 6 to 3 months,

respectively. Maturity dates are April and October 1st, and T-bills usually have originally been issued as a 2-year zero-coupon bond. Underpinned in a cash position that has been floating around 15% to 20% of GDP remunerated by the Central Bank at market rates, issuance of T-bills is more part of the debt strategy (supporting market development and monetary policy management) than of cash management.

**Ghana** – Short-term instruments issued for cash and debt management are represented by T-bills maturing in 3, 6 and 12 months. Until the end of 2018, instead of a 364-days T-bill (started in 2019), the government used to issue a 1-year Treasury Note, by reopening of medium-term notes (2-year or longer). The change draws a line between cash and debt management, but also exemplifies the multiple function of T-bills given that more than 50% of total gross debt issued in 3Q2019 consisted of these securities.

*Source: Debt Management Offices/Agencies websites.*

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While FX-linked, inflation-linked and floating rate bonds issued in the domestic market are connected with cash management in the same way fixed-rate T-bonds do<sup>13</sup>, Eurobonds and FX denominated external loans bring specific features related to the fact that associated cash inflows are in foreign currency. It may require specific arrangements with the Central Bank for the internalization of the funds and raised resources may be kept in foreign currency for the payment of liabilities in hard currency, as a separate cash buffer. Countries such as Brazil, Chile, South Africa and Turkey have liquidity buffers in foreign currency.

Commercial loans can also be contracted domestically with commercial and development banks, especially for project financing. Resources externally borrowed from bi- or multi-lateral creditors for project financing are not seldom required by the creditor (or donor, in the case of grants) to be kept separately of main TSA funds to ensure they will not be used for financing expenditures other than the ones associated to the project. Possible mismatches between disbursement dates and the use of funds create extra cost of carry that may be mitigated by specific governance arrangements to be agreed with the funds’ provider. They might include the temporary investment of the cash (in US Treasuries, for instance) or fine-tuning between its disbursement and use.

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13. Except for the fact that T-bonds provide a precise maturing cash flow forecast given they are fixed-rate securities, unlike FX bonds, floaters and linkers, where scenarios/ estimates need to be used – and buffers built to accommodate unexpected variation of the underline variable remuneration (FX, inflation and interest rate).

Another debt instrument targeting project financing and being increasingly used in the past few years are the so-called thematic bonds, among them green bonds are the most popular. Other examples are blue and social bonds. In a regular approach, the issuance of the bonds generates earmarked funds to be exclusively used in projects fulfilling specific requirements<sup>14</sup>, as sustainability, eco-friendly, etc. From a debt management perspective, it is important to define how these instruments fit and are incorporated in the debt management strategy. On the cash management side, thematic bonds cash flows payments tend to follow similar procedures as of the ones applied for T-bonds, while the use of proceeds follows specific and stricter guidelines.

One last debt instrument used by Islamic countries is the Sukuk (or Sharia-compliant bond). While under a debt design perspective they look similar to a fixed-rate T-bond, usually aim at financing projects in a way that “a sukuk holder is granted an ownership interest in the assets or business being financed, and the return is tied to the performance of the underlying assets”<sup>15</sup>. From the cash manager’s perspective, in terms of scheduling of the government’s payments obligations, Sukuk should be treated as debt payments and requires close coordination with debt managers.

Coordination between cash and debt management is greatly related to the instruments to raise money to meet government obligations, but it is not limited to that. Another aspect to facilitate and strengthen the correlated well-functioning of both activities is the liability management operations. Government securities buy-backs and switches are the most common ones to deal with refinancing and liquidity risks, to avoid the need of large borrowing on short periods.

Debt maturity concentrations (benchmark bonds) created for market development purposes increase debt refinancing risk<sup>16</sup> and are managed through pre-refinancing, buy-backs or switches. If these maturities come due during the low-cash balance times, they can also lead to liquidity risk distress. In this regard, even if a government manages to rollover its debt and there is no skepticism in the market about its ability to do so, other commitment payments may be postponed due to government inability to have the necessary cash at the right time (led by a cash flow problem, not a refinancing one). Therefore, maturity dates should be planned to support smoothening volatility of cash balances, at the possible extend, given that a benchmark policy will constrain an extensive scattering of the amortization profile. The above-mentioned 3 tools are

proven to help in the endeavor of supporting debt and cash management objectives, mitigating intrinsic conflicts.

Formal mechanisms as the creation of coordination committees can be a good first step to strengthen the communication between cash and debt management, especially in the countries where functions are scattered in different departments. Several developing countries have recently adopted these arrangements<sup>17</sup> mainly focusing on improving cash flow forecasting and strengthening the connections between these estimates and the short-term debt strategy/auctions. While it creates a formal platform for information sharing and improved coordination, it does not avoid bad practices as cash rationing and accumulation of arrears if connection between cash, debt and budget management is weak. The information flow and formal interaction with other related committees (treasury management, auction decision) and activities (budget management, cash allotment) are also key to ensure that outputs of cash management committees are adequately considered in the decision-making process.

On the other hand, there are many other countries that adopt an integrated institutional arrangement where cash and debt management are performed by the same department, requiring, in this case, internal coordination rather than formal committees (Colombia, France, Hungary, India, Peru, Romania, Slovenia, Thailand, Turkey and UK). Examples of institutional arrangements adopted by selected countries are shown in the Annex.

Funding instruments described in this Section can be used by cash and debt managers in different set of combinations to ensure that cash will be available when needed and with the possible lowest cost. The more developed the debt and money markets are, the more countries tend to use a wider range of instruments to finance the funding gap. To this end, there is no formula which fits the needs of cash and debt managers and as long as the selection of the instruments are determined considering the limitations of the financial markets it is always possible to achieve the objectives of cash management by using fewer instruments.

14. There are recent discussions pointing out for investors willing to allocate funds in countries “considered” green, instead of specific projects being labeled as so. For more information about green bonds see - <https://treasury.worldbank.org/en/about/unit/treasury/ibrd/ibrd-green-bonds>

15. <http://www.mifc.com/index.php?ch=39&pg=97&ac=312&bb=attachpdf>

16. Inability to rollover the debt (or doing it at unexpected high cost) given lack of willingness of investors to buy new government securities to replace the ones maturing.

17. Albania, Bolivia, Chile, Eswatini, The Gambia, Ghana, Lesotho, North Macedonia, Nigeria, Rwanda.

In parallel, countries that carry large (remunerated) buffers and do not face frequent cash imbalances, may not necessarily need to use all the array of instruments, but should dedicate efforts to diversify their investor base, for instance. On the other hand, countries with structural fiscal deficits will not be able to overcome the lack of resources by using more funding

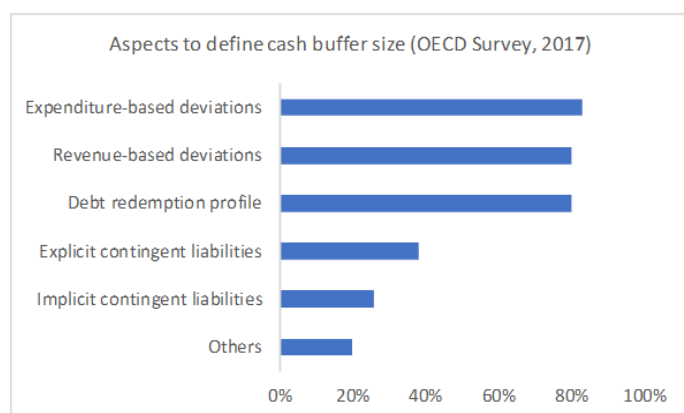
instruments. Therefore, the development of multiple money market instruments and associated infrastructure should be pursued, but simpler actions which may bring equally important results (e.g. transparency for market participants, coordination with debt managers and Central Bank, intra-government borrowing) must be taken.

## >> III. LIQUIDITY BUFFERS AND MANAGING EXCESS CASH BALANCE

The establishment of a liquidity buffer<sup>18</sup>, similarly to what was discussed for the T-bills, is part of cash and debt management policies (as reflected in Figure 5). It serves for the mitigation of risks that are mostly, but not solely, present in cash management (liquidity, operational, settlement and payment) and debt management (refinancing and related to market volatility). As the accumulation of large liquidity buffers mean increasing the cost of carry related to keeping these resources, there is a trade-off between the cost and the risks that are meant to be mitigated by the cash cushion. The cost of carry can be minimized by determining the size of required cash balance and investing the cash not for immediate use. There are different approaches across countries to determine the size of liquidity buffers (Box 7).

### >>> BOX 7 – DEFINING THE SIZE OF LIQUIDITY BUFFER

The definition of the liquidity buffer size is not necessarily a function of a single parameter, but commonly a combination of more than one factor. Below are some examples on how countries define the size of liquidity buffer, based on an OECD survey undertaken in 2017 with 35 member countries, complemented by countries specific practices.



**Albania** – a liquidity buffer floor is defined by the average of expenditures of the three last days of the previous month (when outflows are concentrated), while the ceiling is determined by expected expenditures of the first week of the current month.

**Brazil** – an informal minimum cash balance is targeted aiming to cover 6 months of domestic debt refinancing needs. There is also a separate liquidity buffer for external debt (capped on the debt maturing in 1,500 days).

**Ghana** – minimum cash balance is (not formally) defined as a nominal number (roughly USD 170 million) based on the historical data of debt maturity profiles and above the line items.

**Romania** – no specific level for the liquidity buffer, but if cash is decided to be invested, a minimum (non-invested) balance is required (approximately EUR 200 million) during the investment period.

**Thailand** – minimum balance is required to cover at least 2 weeks of future expenditures.

**Turkey** – minimum cash balance is determined as a percentage of the maturing debt in the coming months, and the level is calculated through considering (i) average demand decrease in the market (on volatile times); (ii) share of planned financing in stress periods; (iii) forecasted inflows and outflows for the year; and (iv) maturity profile of debt obligations.

**Uruguay** – cash buffer is determined as a range, where the minimum target is expected to cover the debt service under an extreme stress period (12 months without new issuance). Statistical calculations, based on the historical volatility of cash flows, are also considered to define the interval.

*Source: OECD WPDM 2017 Survey on Liquidity Buffer Practices, and country cases presented in the WB Cash Flow Forecasting and Cash Management Workshops (2018 and 2019).*

18. Commonly also referred as cash cushion or cash buffer.

## >>> A. PREREQUISITES OF INVESTING EXCESS CASH

Investing idle cash in the market reduces the cost of carry, however there are prior conditions which are not always in place. Essential features are the cash consolidation under the TSA, reliable cash flow forecasting, good coordination with debt management, capacity to define the cash buffer size and to execute the investments, availability of investment instruments and market infrastructure, and design of an investment policy.

Among this myriad of pillars that will sustain the investment decision and execution, the reasons why it is important to have them in place before investing cash balances are simple and clear. Government needs to: i) be aware of cash availability in the present and in the future; ii) be aware of carrying cost and define a policy to minimize it; and c) pre-defined risk policies that will drive where to be positioned in the multiple options between accepting less or more risk in favor of more or less cost (see subsection C below on the instruments to invest cash in the market).

Government's ability to produce reliable cash flow forecasting and raise money when needed to cover temporary cash shortages, minimize (but may not eliminate) the need to hold cash balances (liquidity buffers) and consequently the cost of carry. Accurate cash flow forecasting is underpinned on adequate methodology/procedures, work-intense data collection, storage and treatment, and appropriate institutional arrangement. However, even during times when robust estimates are in place, volatility in the cash flows and operational issues may lead to the need of unexpected short-term borrowing<sup>19</sup>. On its turn, government capacity to raise the necessary funds on time will depend on the availability of needed instruments, financial markets development level and robust infrastructure. Alongside with the aspects described in Box 7, these factors will drive the definition of the size of the liquidity buffer and investment policies to minimize associated cost of carry.

In Sweden, the targeted cash balance is zero, given that the totality of the daily remaining balance in the TSA is invested in the money market. The country relies on its immediate ability to raise money in the market, even to cover cash shortages caused by operational issues, and to quickly invest remaining cash balances once all liabilities are daily paid. However, even in advanced countries with liquid government securities

and interbank money markets (e.g. France and USA) cash managers have recently adopted a more cautious stance by accumulating or increasing cash balance after the Global Financial Crisis<sup>20</sup>. Not justified by the lower liquidity level of their domestic markets, but because of earmarked funds and other structural reasons, Brazil and Peru are among the countries keeping the largest cash buffers. On the other side, there are countries with no formal cash buffer targets, including because of underdeveloped cash management frameworks or constrained fiscal situations (Angola, Bolivia, Equatorial Guinea, The Gambia, Ghana, Honduras, Lesotho, Nigeria, North Macedonia, Rwanda).

It's relevant noting that in whichever is the case, the arrangement with the Central Bank on the remuneration of the idle cash deposited in the Bank will represent a big driver on the definition of the size of the liquidity buffer. France, for instance, invest most of the government cash balances in the money market, but has a limited buffer at the Central Bank not invested to address operational and IT risks, accepting associated cost to mitigate these risks. The arrangement on Central Bank's profits and losses transfers to the Treasury (Ministry of Finance) also matters (see discussion below).

## >>> B. MINIMIZING THE COST OF CARRY

Although active investment of excess cash in the market requires prior conditions, it does not mean that less developed countries which do not meet above-mentioned prerequisites are unable to reduce the cost of carry. To this end, the first possible action is refining the matching of cash inflows and outflows to reduce cash imbalances (including excess of cash). Different from cash rationing, this is an effort to smooth out cash balances by matching the calendars of expenditures payments and revenues receipts. This is a two-way avenue: defining large above-the-line expenditures distant from large debt maturities (and vice-versa) and setting collection dates of large revenues closer to these significant outflows. Potentially it is also possible to define a borrowing plan where issuance volumes are increased closer to the periods of expected low cash balances. However, it may not be practical and desirable given the regularity and predictability valued by investors on the debt issuance profile. Cash flow matching needs to be underpinned by strong cash flow forecasting and robust coordination between government entities (bottom-up approach).

19. Some countries define layers of cash buffers to cope with different risks (liquidity, volatility, operational), which also drives the kind of investment for each layer to be allocated, according to their needed liquidity.

20. OECD WPDM 2017 Survey on Liquidity Buffer Practices revealed that almost half of the countries responded that there has been policy and operational changes in their liquidity buffer practices in the previous 5 years, and about a quarter were planning to do it in the short-term, showing that the definition of the level of liquidity buffer is an evolving process.

The second way to minimize the cost of carry is to explore arrangements with the Central Bank for the remuneration of the cash balances deposited in the TSA, ideally at the market rates, as stated as a minimum requirement at DeMPA DPI 11.2. This second dimension of “Cash flow forecasting and cash balance management” DPI assesses the “decision of a proper cash balance (liquidity buffer) and effectiveness of managing this cash balance in government bank accounts”. For countries being remunerated by the Central Bank, the conditions may significantly vary. Brazil, Colombia and Turkey have their cash balances remunerated by market interest rates, while Peru and Bolivia do not (the latter receives remuneration linked to inflation). Chile and Slovenia use time deposits offered by the Central Bank and South Africa outsources the cash investment for the Corporation for Public Deposits, a subsidiary of the South African Reserve Bank.

There are also countries which deposit TSA cash balances in the Central Bank receiving no remuneration (Albania, The Gambia, Ghana, Honduras, Nigeria, Rwanda, Seychelles, Thailand and Uruguay). Some of them face legal restrictions and entered into agreements where there is a “compensation” represented by free-of-charge services provided by the Central bank for the Ministry of Finance, normally related to the TSA operational activities. Even in the cases where the Central Bank’s profit is transferred to the Treasury (somehow compensating the lack of remuneration of TSA cash balances), a possible route might be to strengthen transparency through regulations to enable the monetary authority to remunerate the TSA balances and on the other hand charge for its services, under an arrangement where proper cost allocation is clearer (Turkey adopted these measures in 2011).

Brazil has recently published a report on the relationship between the National Treasury and the Brazilian Central Bank<sup>23</sup> that sheds light on CB profit and losses composition and transfer framework, TSA structure and earnings, and CB treasury securities portfolio used for repo transactions. Pessoa and Williams (2012) present a thorough discussion about this relationship, which details are beyond the scope of this paper.

## >>> C. INVESTING CASH BALANCES IN THE MARKET

Besides the possibility of having TSA balances remunerated by the Central Bank, provided that prior conditions are in

place, investing government cash balances in the market not only may lead to better remuneration, but also has the positive collateral effect of fostering the development of money and government securities markets, through the strengthening of price references. On the other hand, it creates counterpart credit risk to be accounted and monitored closely.

Coordination with the Central Bank is highly critical when investing the cash in the financial markets. The monetary authority welcomes information on cash flow forecasting, including planned short-term borrowing and investment resulting flows (that also affect the liquidity in the financial system). When sharing this information, cash managers mitigate the risk of competition with the Central Bank as it will carry out its monetary policy transactions taking into consideration government cash needs or excess of it. The coordination should ensure that the two government entities will not be unnecessarily at the same side of the market, competing for raise cash (drying-up liquidity) or invest it (injecting liquidity). Investing all the excess of cash in the market facilitates Central Bank’s own cash flow forecast and liquidity management since all the government liquidity is re-injected immediately in the market.

Regarding investment instruments, cash managers may opt to use more than one (when available) in order to access different risk-return alternatives, according to investment time horizons and government risk appetite. The most common ones are illustrated in Figure 5 and their characteristics are described below.

**Deposits:** Commercial bank deposits are one of the fastest and easiest ways to invest cash, given that they are uncollateralized (no settlement system and margin calls<sup>24</sup> are needed), do not have maturity dates as oppose to short-term instruments (possible automatic rollover) and tend to offer good remuneration compared to other alternatives. India, for instance, carries out auction of government cash balances to maximize the return. On the other hand, considering that the deposits are subject to the credit risk of the recipient banks and not backed by any asset in case of default, these are more commonly used only for overnight or very short-term tenure. Investing in multiple banks to diversify the risk can be good strategy, keeping in mind that it requires multiple credit risk assessment and permanent monitoring of all counterparties.

21. Score C (minimum) requires that Issuance of short-term instruments is planned according to the forecast of monthly cash balances. In addition, the central government manages its surplus cash (that is, cash in excess of the target) through investment in the market in line with appropriate credit risk limits or with the central bank at market-related rates.

22. Even in those cases, countries still bear a cost of carry as they usually invest cash in shorter maturities than the ones used for debt issuance, and the yield curve commonly present a positive slope (meaning higher interest rates in the long end).

23. [https://sisweb.tesouro.gov.br/apex/f?p=2501:9:::9:P9\\_ID\\_PUBLICACAO\\_ANEXO:7141](https://sisweb.tesouro.gov.br/apex/f?p=2501:9:::9:P9_ID_PUBLICACAO_ANEXO:7141)

24. Provision of additional collateral when its price goes down.

**Government securities:** Using the excess of cash to buy government securities is another widespread practice. Cash managers can either buy-back the government's own domestic bonds in the secondary market or invest in sovereign bonds of other countries (e.g. Slovenia). The latter is more usual for investment of liquidity buffers held in foreign currency, where investing in the US Treasuries is the most common practice, given its liquidity, low credit risk and denomination in USD. Countries such as France, Belgium, Netherlands and Germany set arrangements between them to do cash deposits with each other since there is no currency risk. These inter-country cash transactions may involve government securities as collateral.

**Corporate bonds:** It is less common to invest cash in corporate bonds, either issued by financial institutions (e.g. certificates of deposits) or companies (e.g. commercial papers, debentures). Given the low liquidity of these securities compared to government bonds, cash managers can either seek an early redemption option, or invest in a medium-to long-term horizon, targeting a better remuneration. Assessment and permanent monitoring of counterpart credit risk is also an outmost, which requires technical and human

resources capacity. The UK is an example using certificate of deposits and commercial papers, although most of the liquidity is invested in reverse-repo transactions.

**Reverse repo:** This is probably the most common investment instrument used by cash managers. Reverse repo transactions present comparative disadvantages to the other previously explored options but have one determinant advantage: it is backed by a collateral. Therefore, government gets exposure to the credit risk of the collateral issuer (most commonly itself) in lieu of the one associated to the transaction counterpart. The management of the collateral adds complexity (and cost) and the lower risk of this instrument results in lower remuneration. Given the strengthened credit risk, it is commonly used for longer periods, from few weeks to 1-3 months. The liquidity of the collateral, which is usually government securities, drives the liquidity risk assumed by the government in the transaction. Although the securities can be cancelled if the collateral is executed, resulting in a reduction in government debt stock (net present value is neutral), this situation is not desirable given that government needs cash in the short-term in the closing of the transaction.

> > >

**TABLE 2 - Instruments Used by Selected Countries for Investing Excess of Cash**

	Central Bank deposits	Bank deposits	Government securities/buy-back	Other securities	Reverse-repo
Albania					
Brazil					
Chile					
Colombia					
France					
Hungary					
India					
Peru					
Slovenia					
Sweden					
Turkey					
UK					
USA					

*Note: Angola, Equatorial Guinea, Eswatini, The Gambia, Ghana, Honduras, Kosovo, Lesotho, Nigeria, North Macedonia, Romania, Rwanda, Seychelles, Thailand and Uruguay have not invested excess of cash in the market (reasons range from lack of capacity, lack of legal authorization or lack of idle cash).*

*Sources: Debt Management Offices/Agencies websites and countries presentations made in the WB Cash Flow Forecasting and Cash Management Workshops (2018 and 2019).*

Countries experiences show that investing cash in the market is directly associated to the level of market development, in other words, availability of instruments, infrastructure and players. The deepening of domestic debt and money markets is a common objective of cash and debt managers, as well as of the CB and a medium-term plan to this end should be devised. Lienert (2019) offers an interesting approach on sequencing cash management reforms where active investment of cash balances comes in the later stages of the reforms, given supporting pillars needs to be built in earlier stages.

While debt management implementation is guided by the MTDS, when it comes to cash management, investments are driven by investment policies rather than strategies<sup>25</sup>. These policies take care of credit and liquidity risk management, commonly setting exposure limits to counterparts and instruments<sup>26</sup>. Table 3 shows an example from Chile.

> > >

**TABLE 3 -Chilean Cash Management Investment Policy**

Domestic Portfolio	Asset class			
	Money Market (Instruments shorter than 1 year)	Instruments maturing from 1 to 3 years (fixed-rate)	Instruments maturing from 1 to 3 years (inflation-linked)	Maximum limit by instrument (% Domestic Portfolio)
Domestic Currency				
Central Bank deposits	X			100%
Instruments issued by the Central Bank	X	X	X	100%
Reverse-repos	X			50%
Commercial bank deposits	X	X	X	60%
Short-term debt mutual funds	X			20%
Foreign Currency (USD)				
Central Bank deposits	X			100%
Instruments issued by the Central Bank	X	X		100%
Reverse-repos	X			50%
Commercial bank deposits	X			45%
Maximum limit by asset class (% Domestic Portfolio)	100%	20%		

International Portfolio	Asset class			
	Money Market (Instruments shorter than 1 year)	Instruments maturing from 1 to 3 years (fixed-rate)	Instruments maturing from 1 to 3 years (inflation-linked)	Maximum limit by instrument (% Internationa Portfolio)
Foreign Currency				
Sovereign Bonds	X	X	X	100%
Overnight investments	X			50%
Bank deposits	X			
Certificate of deposits	X			
Short-term debt mutual funds (Money Market Funds and ETFs)	X			
Maximum limit by asset class (% International Portfolio)	100%	20%		

25. Investment policies will define limits and conditions for the use of instruments, while debt strategies set directions for the government financing (possibly setting targets).

26. Buy-back can be an alternative to reduce cost of carry if the cost of new debt is lower than of the existing ones (and the differential higher than "other investments" remuneration), provided that there is an excess of cash to be invested/allocated.

## >> IV. CONCLUSION AND KEY FINDINGS

The Global Financial Crisis and the recent COVID-19 pandemic proved once again that efficient management of government's liquidity is crucial to respond to unanticipated revenue losses and increases in expenditures. Uncertain economic situation and unfavorable market conditions worsen the cash position, especially in countries with weak budget controls and poor cashflow forecasting. On the other hand, modern cash management provides tools to avoid delayed payments and accumulated arrears which are simply (i) the consolidation of bank accounts, (ii) generation of daily cash flow projections for at least next three months, (iii) integration (or at least seamless coordination) of cash and debt management, and (iv) contingencies for stressed conditions.

Country examples, based on the presentations of practitioners delivered in a series of cash management workshops organized by the World Bank, and the findings of DeMPA assessments, indicate that full implementation of modern cash management is still a challenge. A TSA system is common in most countries, but further challenges remain. Following the Global Financial Crisis, the strategy for building up liquidity buffers in many advanced and emerging countries give clues on the need for a hedge, due to the size of forecasting errors and volatility of cash flows. Possible renewed liquidity interruption in interbank markets also contributes for reviewing cash buffer policies. Therefore, cash flow forecasting is an area to improve in many developing countries, as shown in Figure 4 (DeMPA assessments) and in the low frequency of accuracy analysis made by countries who attended the workshops. Time horizon not shorter than the budget year, weekly/daily breakdown and updates constitute sound practices to be pursued, as adopted by Colombia, South Africa and Uruguay.

Coordination across institutions is vital for accurate cash flows forecasting. The analysis of country practices indicates that the coverage of cash flow projections, the horizon and frequency of forecasts are quite limited in many cases. To this end, consolidation of cash management functions in one unit, establishing a structured data/information collection framework, and setting up formal coordination mechanisms between cash management and budget, debt management and monetary policy implementation would be a good first step to improve the capacity to generate reliable and accurate cash flow projections.

When it comes to the use of instruments to cover cash shortages and investment of the excess of cash in the market (or with the Central Bank), challenges in developing, and especially low-income countries, are even larger than on

cash flow forecasting. As pointed out by DeMPA assessments (Figure 4) just 8% of 80 assessed lower income countries get a minimum score or above at DPI 11.2 (cash management), and in 3 out of the 5 regions none of the countries reached this minimum. The connection between cash flow forecasting and the issuance of T-Bills can be strengthened and made clearer and more transparent in some countries. However, investment of the idle cash seems to be a rather bigger weakness, with many countries placing their liquidity buffers in the Central Bank with no remuneration.

Cash managers can cover temporary cash shortages using multiple instruments that fits better to different needs in terms of time horizon and risk appetite. However, most of the assessed developing countries solely rely on the issuance of T-Bills and do not use repo transactions, mostly because they have underdeveloped money markets, lacking legal framework, and collateral liquidity concerns in case of counterparty default<sup>27</sup>. On the other hand, intra-government borrowing which has been increasingly used by emerging market economies, (Colombia, Peru and South Africa) might be an option for the countries where the government bond markets are less developed.

The active investment of cash balances in the markets is incipient or inexistent not only in low-income countries, but also on different income level countries listed in the introduction. Out of the 24 countries that participated in the WB cash management workshops, only Albania, Bolivia (offshore), Chile, Colombia, Peru, Slovenia and South Africa claimed to invest their surplus balances in the market. Weak cash flow forecasting, no formally defined liquidity buffer and underdeveloped money market are the main reasons explaining this gap.

On the other hand, transparency on the use of financial instruments either for covering cash shortages or investing cash balances should always be a priority that will pave the way for the possibility of using more advanced strategies. Countries such as Turkey, Hungary, the UK and France include specific sections about cash management in their Annual Debt Reports, for instance. Coordination between debt and cash managers and the Central Bank is essential to avoid unnecessary borrowing costs and misleading signals from the government to the market.

27. None of the 24 participant countries in the WB Cash Flow Forecasting and Cash Management workshops use repo transactions to cover cash shortages.

To conclude, country experiences indicate a significant room for short-term improvements in all aspects of cash management including the accuracy of cash flow projections, efficient use of funding instruments for temporary cash shortages, and investment of TSA balances to reduce the cost of carry. To this end, strengthening the technical capacity in cash management, improving the governance structure and the coordination with fiscal, debt and monetary policy enable governments to better manage liquidity and cope with stress situations as proven once more in Covid-19 pandemic.

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## >> ANNEX: INSTITUTIONAL ARRANGEMENT OF CASH AND DEBT MANAGEMENT IN SELECTED COUNTRIES

### >>> COLOMBIA

The Colombian government has been strengthening cash and debt management through a process of progressively integrating both mandates under the Dirección General de Crédito Público y Tesoro Nacional – DGCPTN (Public Credit and National Treasury General Directorate). The recent National Development Plan 2018-2022 expands and strengthens DGCPTN functions on the management of the cash unit, of the excess of cash and financial assets of other public entities. The last is particularly innovative and other countries<sup>28</sup> have been gradually adopting the holistic overview of public sector balance sheet.

The current focus of the Plan, once debt and cash management activities are already integrated under the same Directorate (and 2 different sub-Directorate), has been the IT systems strengthening, including the modernization of the ones used for cash management, treasury and debt management.

According to the annual fiscal programming, in terms of

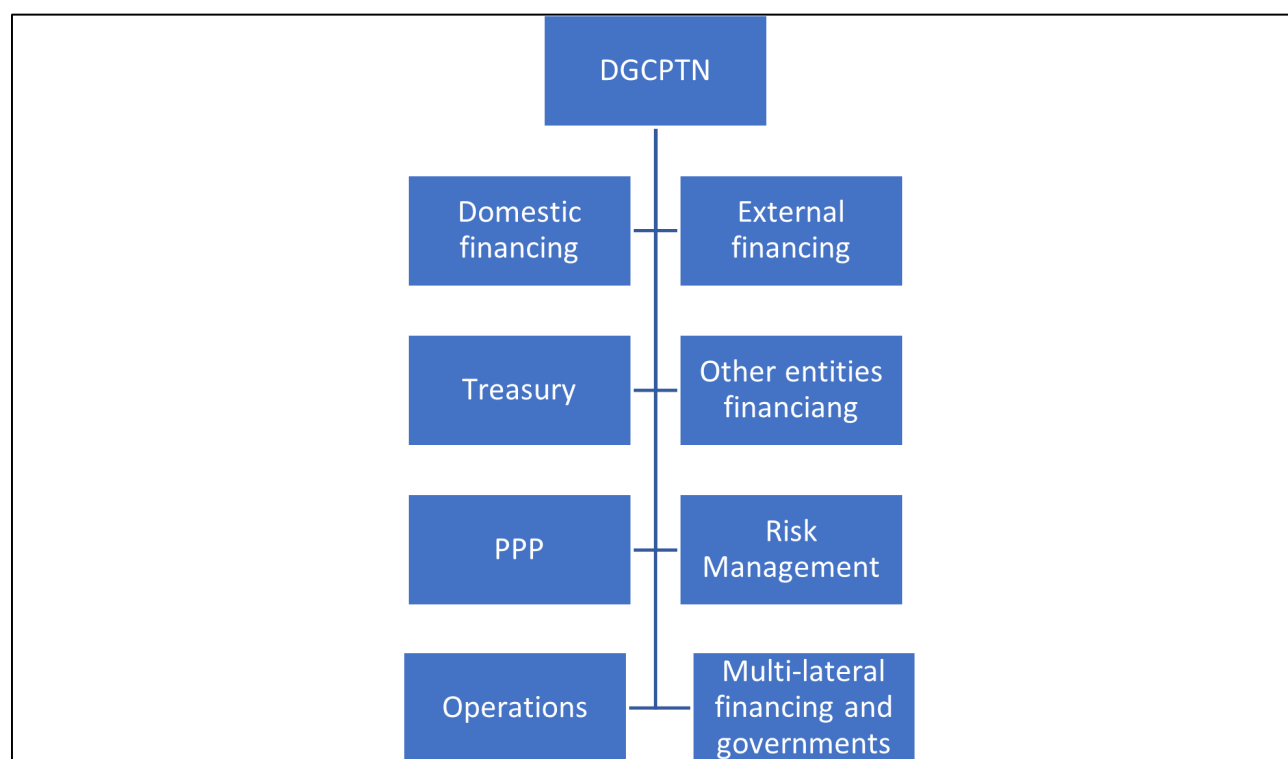
debt management processes, financing targets are defined according to the deficit to be covered and the needed cash balances. There is a straight coordination between Domestic Financing and Treasury sub-directorates on the numbers related to cash needs, debt redemptions and issuances, and T-bills issued for the activities of both debt and cash management.

Domestic Finance Sub-directorate issues T-Bills maturing in 1 year, and long-term T-Bonds maturing from 4 to 18 years. On the other side, Treasury meets its short-term financing needs through intra-government loans<sup>29</sup> instrumentalized by the issuance of papers reflecting the interest rate paid on the excess cash invested at the Central Bank.

The Treasury also uses repo (and reverse repo) operations to raise short-term money and invests temporary idle cash. These investments are complemented by remunerated deposits at the Central Bank, and Colombian government securities, in pesos, and foreign bank accounts, time deposits, money market funds and sovereign global bonds, in US dollars.

> > >

**FIGURE 6 - Organization Chart of Dirección General de Crédito Público y Tesoro Nacional**



Source: Ministerio de Hacienda y Crédito Público (Colombian Ministry of Finance)

28. E.g. New Zealand, Denmark, Indonesia. See Cangoz et. al. (2018)

29. Treasury has access to resources of special funds under its administration, Development funds (Sistema General de Regalías) and from some SOEs.

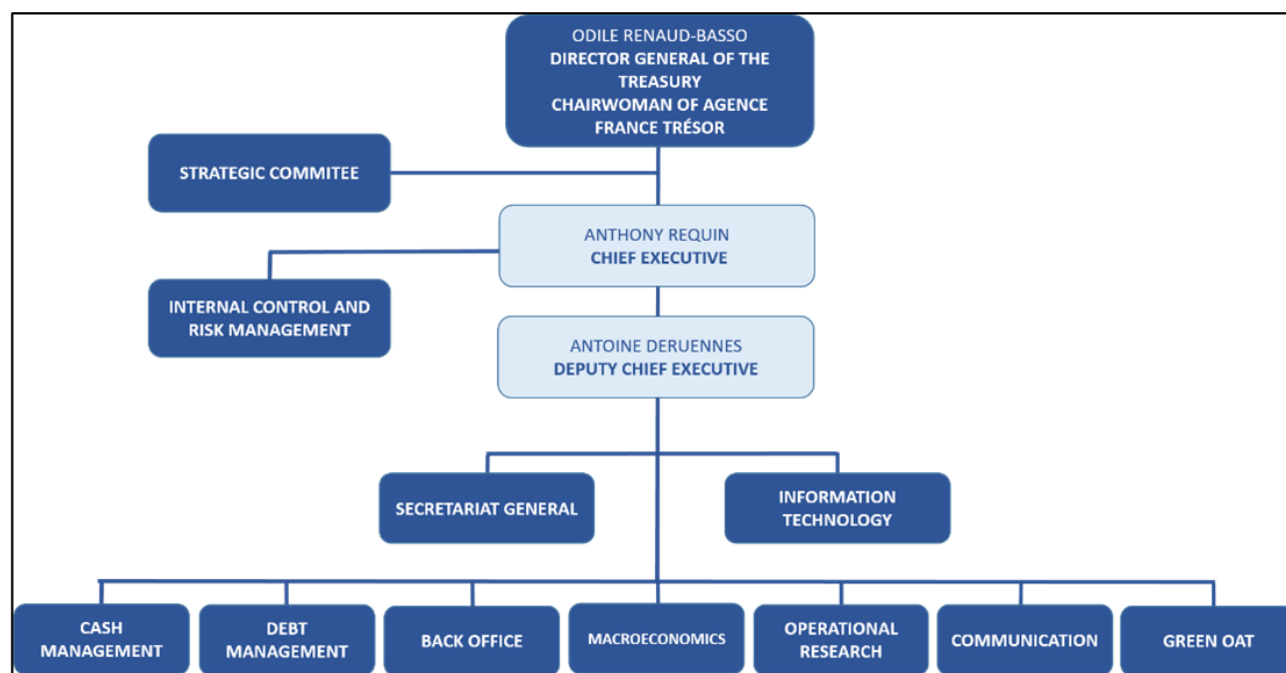
## >>> FRANCE

There is a cash management unit within the debt office. Its activity is supported by common back office, IT and internal control and risk management units. Short-term transactions undertaken on the money market to cover cash shortages and invest excess of cash are led by the cash management unit, while T-Bills and T-bonds are all issued by the debt front-office ('debt management' in figure 7), including liability management operations to deal with different risks related to cash and debt management (e.g. liquidity, refinancing, counterpart, interest rate risks). Being in the same department allows a very smooth and informal coordination between the cash management unit and the debt front-office, for example to decide on the amount and maturity of T-bills to be issued at the weekly auctions.

The Agency is organized under the organogram presented below:

> > >

**FIGURE 7 - Organization Chart of Agence France Trésor**



Source: Agence France Trésor

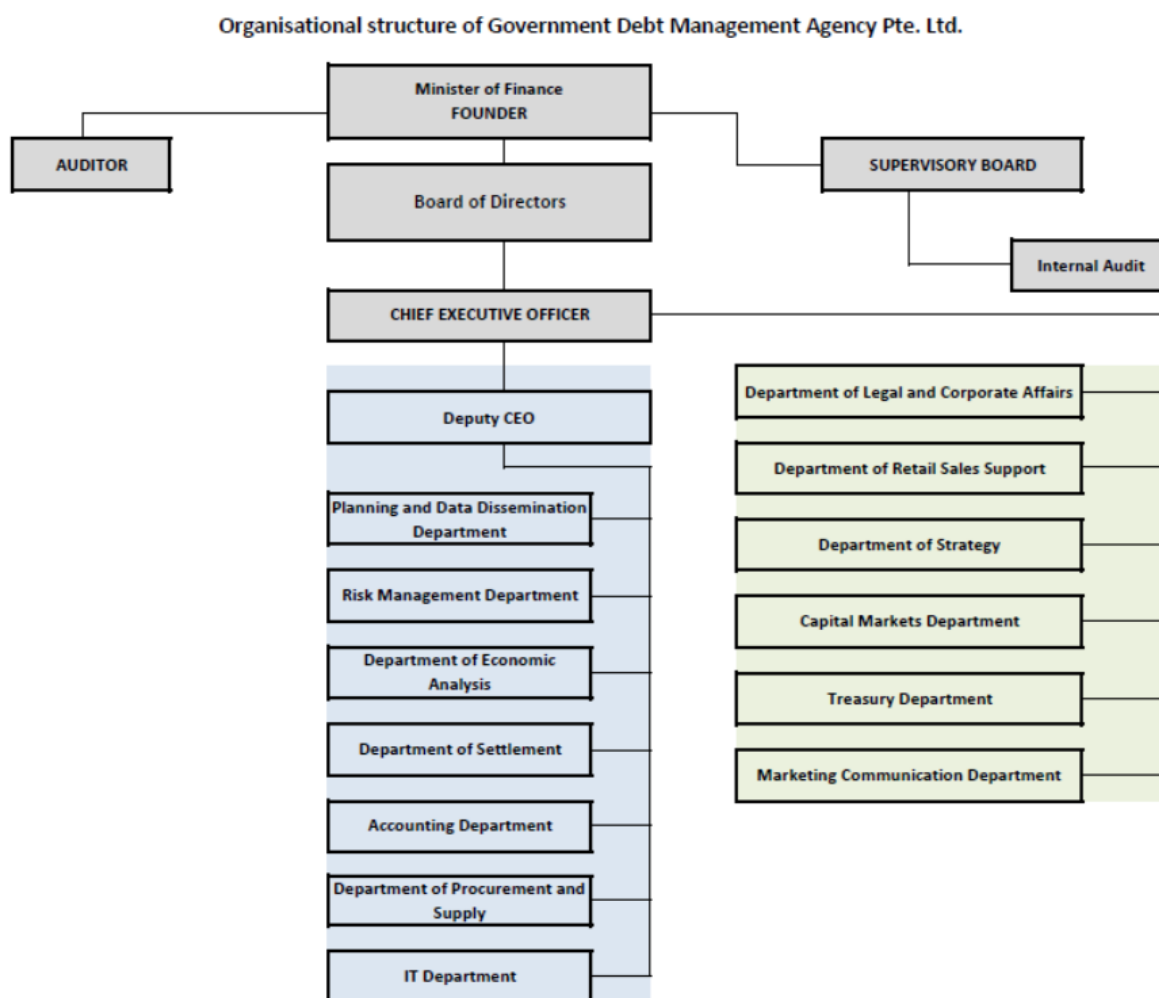
## >>> HUNGARY

Public debt in Hungary is managed by an independent agency which is fully owned by the Ministry of Finance. It used to be an organization within the Treasury and turned into an independent agency (ÁKK Rt. – Government Debt Management Agency Ltd.) in 2001.

The main focus of the agency is debt management, but it's also responsible for cash management as one of its main duties to "ensure that the central government deficit and debt redemption are financed, and the government debt and the temporarily free-cash-funds of the state are properly managed"<sup>30</sup>. The organizational structure indicates a fully integrated cash and debt management under single back, middle and front offices.

> > >

**FIGURE 8 - Organization Structure of AKK**



Source: AKK

30. Source: AKK

## >>> THE UNITED STATES OF AMERICA

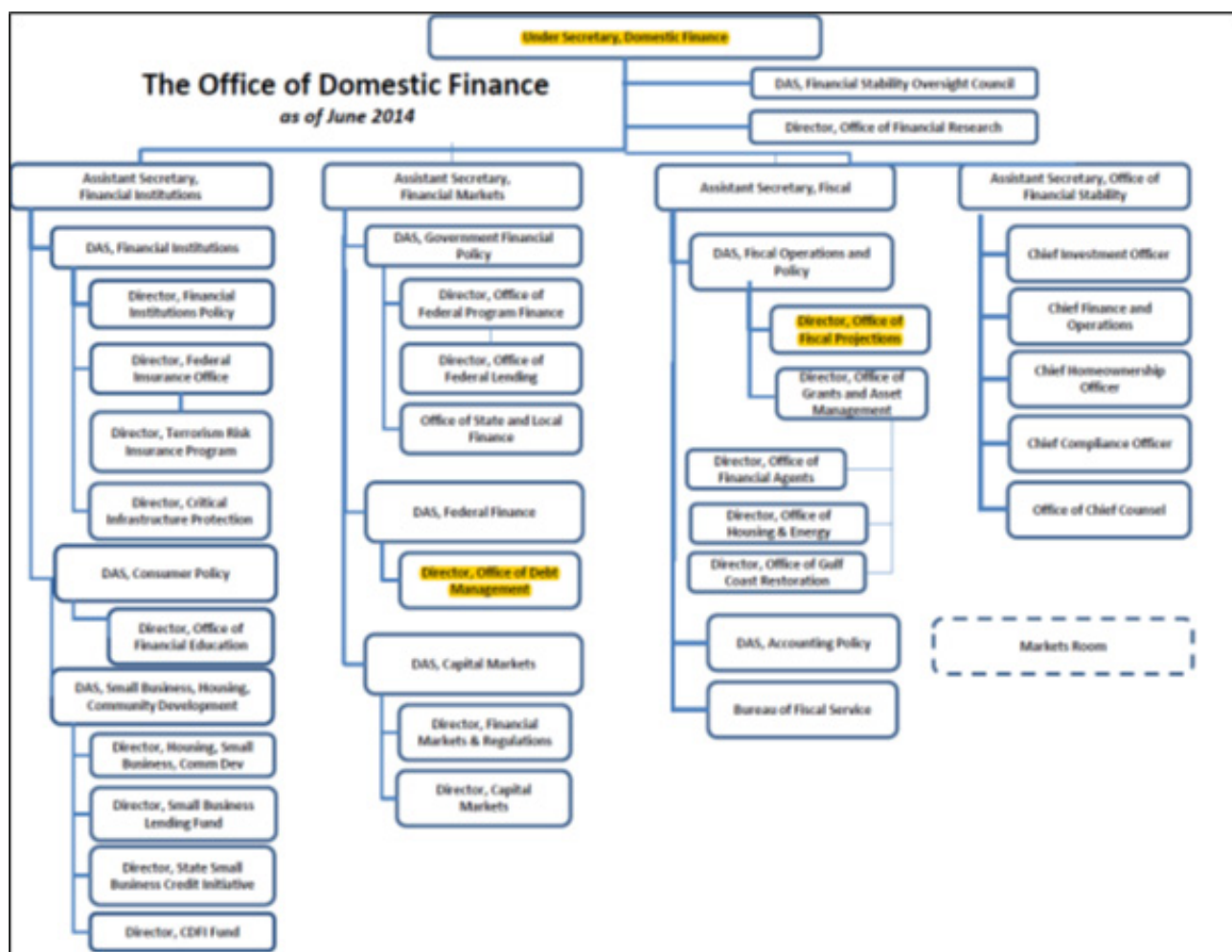
Cash and debt management units are located in the same department and report to the same Under-secretary that is in charge of Domestic Finance. However, debt and cash management are subordinated to different Assistant Secretaries. Office of Debt Management (ODM) is placed in the Financial Market, while the Office of Fiscal Projections (CMU) is part of the Fiscal. CMU manages the government's daily cash position and produces cash and debt forecasts used for determining the size and the timing of the government's financing operations.

ODM and CMU meet twice a week to discuss the financing plan of the week and the cash balance before disclose it to

the market. "The Office of Debt Management is also providing advice and analysis on the matters related to the Treasury's debt management policy, the issuance of Treasury and federally-related securities, and financial markets." to the Assistant Secretary for Financial Markets. Even though debt and cash management are not integrated under the same unit, governance and coordination mechanisms are in place, and a single government actor issues securities for the financing of the budget deficit and rollover of the public debt. The chart below shows the extension of the agency structure:

> > >

**FIGURE 9 - Organization Chart of Domestic Finance Undersecretariat of the US Treasury**



Source: US Treasury

