The Bulgarian National Bank, the Fiscal Reserve and the money multiplier

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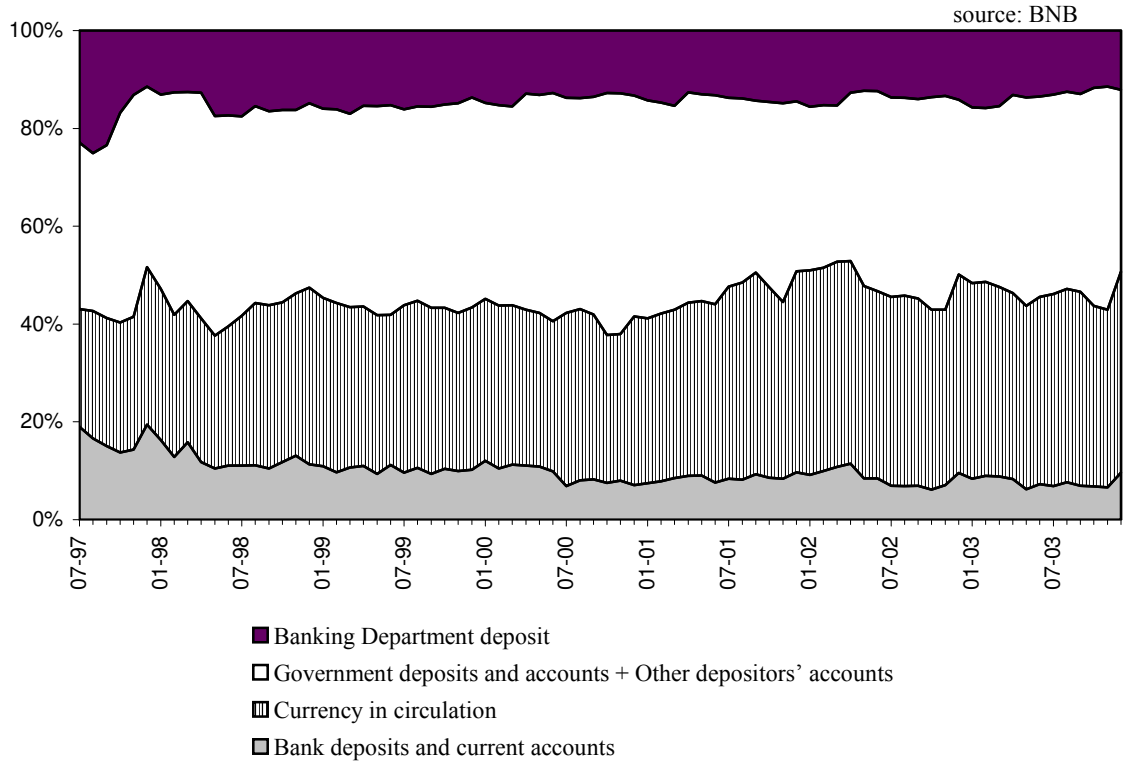
Introduction

Bulgaria set up a currency board in July 1997 in order to put an end to the monetary and financial crisis that culminated in a hyperinflation in 1996. Since then, the basic rules of currency board arrangements have been abode by, the exchange rate is fixed at EUR 1 for BGN 1.95583, the monetary based is covered entirely with foreign exchange reserve, banknotes and coins are fully convertible. The political consensus that accompanied the institutional reform induced the successive governments to lead a consistent fiscal and budgetary policy, so that any risks of having to takeover the central bank to monetize public deficits are ruled out.

The Bulgarian National Bank (BNB) is divided into two departments with separate balance sheets[1]. Since the main function of Issue Department is to "maintain full foreign exchange cover for the total amount of monetary liabilities of the BNB" (article 20 (1) of the Law on the BNB), its assets are essentially foreign exchange reserves (cash, accounts and securities in foreign currency, plus monetary gold). Its liabilities are currency in circulation, bank deposits, government deposits[2] and the Banking Department deposit.

Figure 1: Structure of the Issue Department Liabilities



From the balance sheet of the banking department, the sources of the deposit with the Issue department are as follows:

[1] The third department, the Banking Supervision Department, does not have a separate balance sheet.
[2] Including the State Fund for Reconstruction and Development (1997-1998) and other depositor's accounts (e.g. deposits of the Banking Consolidation Company in 2000 and 2003, proceeds from privatizations).

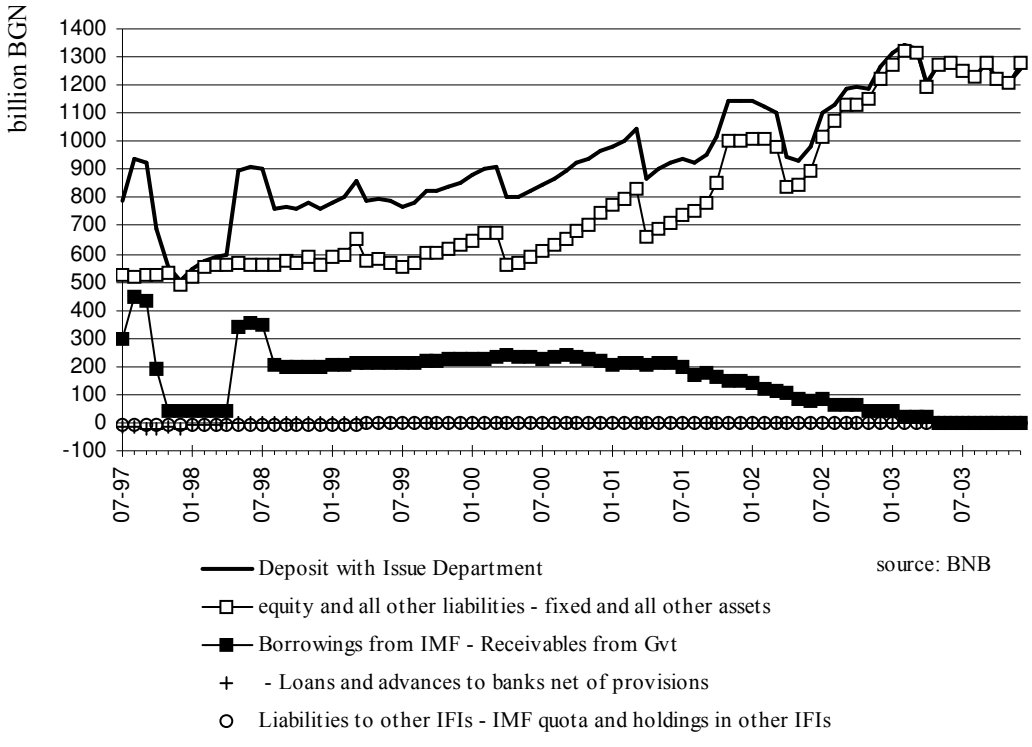
Deposit with the Issue Department =

[Equity and "all other liabilities" – fixed and "all other assets"]
– Loans and advances to banks net of provisions
+ [Borrowings from IMF – Receivables from Government]
+ [Liabilities to other financial institutions
– Bulgaria's IMF quota and holdings in other IFIs[3]]

where "all other liabilities" are the sum of accrued interest payable and other liabilities and "all other assets" add together non-monetary gold and other precious metals, accrued interest receivable, equity investments in domestic entities and other assets.

As shown on figure 2, "Bulgaria's IMF quota and holdings in other international financial institutions" are almost exactly matched by "liabilities to other financial institutions", "loans and advances to banks net of provisions" are negligible. The government debt with the IMF ("Receivables from Government", on the asset side) has been smaller than "borrowings from IMF" on the liability side, until early 2003, the difference allowing a larger deposit with the Issue Department. In agreement with article 45 of the Law on the BNB, the BNB does not lend to the government, "except credits against purchases of special drawing rights from the International Monetary Fund".
Since 2003, the deposit with Issue Department just matches equity (net of fixed and other assets), so that it essentially records excess foreign exchange reserves.

Figure 2: Sources of the Banking Department Deposit with the Issue Department



The present paper focuses on government deposits, whose presence on the liability side of the Issue Department contributes to make the BNB an "unorthodox" currency board. The government deposits in the issue department of the BNB and those in commercial banks constitute what is

[3] International Financial Institutions

commonly referred to as the "fiscal reserve"[4]. These government deposits come from tax and privatization receipts, borrowings from the IMF and other creditors, and are used for payments on expenditures, IMF tranches, etc. Because the BNB does not lend to the government, the fiscal reserve represents a kind of "liquidity in advance" constraint for the Ministry of Finance for payments on current expenditures and debt service.

In June 2003, the government moved part of the fiscal reserve to commercial banks[5]. This gave rise to conflicting views on the possibility of interference with monetary policy and damage to the credibility of the CBA, up to the point that Hanke and Sekerke (2003) even argued that "Bulgaria is destroying its currency board", the discussion being exposed in the Bulgarian press[6].

It has already been argued in many papers that the government deposit at the BNB could give the government some lever on monetary policy (Nenovsky and Hristov, 1998, Nenovsky 1999, Avramov 1999, Sgard 1999, Lelart 2000…). Nenovsky and Hristov (1998) are the first to point it out: "It may be argued that there exists a specific type of transmission mechanism in the context of the Bulgarian currency board. Monetary policy is taken over by fiscal policy and the government has the possibility of manipulating money supply through its deposit at the Issue Department."

In fact, the interference of the government cash management with bank liquidity has long been recognized. In the United States, for example, it was at the centre of discussions and debates about the activity and policy of the Independent Treasury System, created in 1840, that led to the passage of the Federal Reserve Act in 1913. In particular, attempts by Secretary of the Treasury Shaw to use the Treasury funds to control the money supply where criticized (see Andrew 1907, Timberlake 1963). Analyzing the adjustment process in an open economy, Mundell (1961) asserts: "There are three main devices used to offset the liquidity effect of external disequilibrium – apart from changes in government expenditure or taxes. The central bank may alter reserve requirements, shift government deposits between the central bank and the commercial banks, or buy and sell Treasury bills".

The aim of the present paper is to shed light on the effects of the presence of government deposits in the balance sheet of the issue department, in particular on the consequences of changes in the distribution of the fiscal reserve between the BNB and commercial banks.

[4] "The BNB collects, consolidates and sends to the Ministry of Finance (MoF) information on the fiscal reserve, which includes data on the balances in MoF-determined lev and forex denominated accounts of budget spending units serviced by the BNB and commercial banks" (www.bnbank.org, Information on the Fiscal Reserve).

[5] According to Capital Weekly (28 June – 4 July 2003: http://www.capital.bg/weekly/03-26/2-26.htm), the decision was made at a closed meeting at the end of May 2003. The government selected eleven banks, according to the following criteria: a total balance sheet figure of at least 300 million levs, positive operating profit, or branches of large foreign banks with less assets but an investment grade credit rating at least BBB. The institutions had to offer interest rates for various deposit sums and for different periods (6, 9, 12, 15 or 18 months). The contracts were signed early in June. The chosen banks were Banka DSK, Bulbank, United Bulgarian Bank (UBB), Post Bank and Hebros Bank. The total sum of the deposits was 185 million levs, with annual interest rates between 5.4% and 6.2%.

[6] See e.g. *Dnevnik* 23 September 2003 (http://www.dnevnik.bg/englishpdf/23-09-03.pdf).

1- The usual approach to the money multiplier: a reminder and an interpretation in terms of bank liquidity.

The usual approach to the money multiplier assumes that only private agents hold cash and deposits, in given proportions. Assume:

(1) $M \equiv C + D$
(2) $H \equiv C + R$
(3) $R = \rho D$
(4) $C = \gamma D$

where M denotes broad money, D stands for private sector deposits, C for cash in circulation, R for commercial bank reserves, H is base money, ρ for the desired reserves to deposits ratio (including required reserves), and γ for the desired cash to deposits ratio.

In equilibrium, i.e. when cash and reserve to deposit ratios are at their desired level, broad and base money are proportional to deposits: $M = (1 + \gamma)D$ and $H = (\rho + \gamma)D$.
Then, broad money is proportional to base money:

(5) $M = \mu H$ with $\mu \equiv (1 + \gamma)/(\gamma + \rho) > 1$.

In a Currency Board Arrangement, the simplified balance sheets of the central bank (equation 6) and the commercial banks (equation 7) are as follows:

(6) $X = C + R$
(7) $L + R = D$

Hence: $X + L = C + D \equiv M$, the counterparts of broad money are loans to the public (L) and foreign exchange reserves (X)[7].

The sources of monetary creation are the counterparts of monetary aggregates. However, the main determinant is foreign reserves, X, because of the multiplier mechanism:

$M = \mu H = \mu X$
(8) $L = (\mu - 1) X$

It is precisely the purpose of a currency board arrangement to create a direct link between money supply and the balance of payments.

In order to understand how banks create money, it may be useful to consider what could be called a "short term" (or disequilibrium) version of the money supply model. Here, we consider that while R denotes desired bank reserves, banks may hold excess (undesired) reserves (E) in the form of deposits at the Central Bank. Hence the following central bank and commercial bank respective balance sheets:

$X = C + R + E$
$L + R + E = D$

The "multiplier view" assumes that commercial banks adjust loan supply to all shocks, i.e. that loans are endogenous (see equation 8). In the "short term" however, it may be more reasonable to

[7] Applying the analysis to Bulgaria, the central bank in the present model represents the Issue Department of the BNB. Foreign reserves in the model (X) should be interpreted as foreign reserves net of excess reserves, held by the Issue Department in the form of the Banking Department deposit. The central bank does not lend to the government (article 45 of the Law on the BNB).

assume that the amount of loans is given, but that commercial banks may face undesired excess or shortage of reserves, i.e. liquidity. We still have:

$$X + L = C + D \equiv M$$

As a consequence, the amount of money is exogenous, since both counterparts are exogenous. In particular, the composition of the monetary aggregate does not have any effect on the amount of money (in terms of the model, M does not depend on γ), as long as it does not imply any change in the amount of the given counterparts.

We can solve the model for deposits and excess reserves as functions of loans and foreign exchange reserve:

(9) $D = [1/(1 + \gamma)](L + X)$

(10) $E = [(1 - \rho)/(1 + \gamma)]X - [(\rho + \gamma)/(1 + \gamma)]\ L$

Deposits are a fraction of broad money M, equal to its counterparts, L+X, given the assumption on cash holdings. Excess reserves vary in response to movements in foreign exchange reserves (X), albeit less than proportionally, and conversely to movements in loans (L). For example, an increase in foreign exchange reserves will induce an increase of excess reserves of banks, i.e. an increase in bank liquidity. This increase in foreign reserve may result from the payment of exports by non-residents. Deposits in commercial banks increase, so do cash holdings and desired reserves, but the rise in commercial bank liabilities (D) is larger than that in assets (R), leading to an increase in excess reserve (E). Excess liquidity in the "short term" will result in a "later" increase in loan supply, triggering the familiar "multiplier process", whereas a liquidity shortage will induce banks to cut lending. The analysis of bank liquidity thus gives the first stage in the "money multiplier": the multiplicand of L in equation (10) is the inverse of the money multiplier.

Finally, we can point to the fundamental difference between a common central bank and a currency board. As yet, we interpreted X as the amount of foreign assets held by the central bank, which are the only assets an orthodox currency board holds. A common central bank can also discount commercial bank credits, and thus controls perfectly the level of a given type of its assets (although this level may be subordinate to some constraints resulting from monetary policy choice such as a fixed exchange rate regime). Central bank assets (X) can then be split into foreign exchange reserves on the one hand (X_F) and discounted loans (X_L) on the other hand.
Discounted loans also appear as an additional liability in the commercial banks' balance sheet. The counterpart of broad money is equal to $X_F + L$. Excess bank reserves are then:

(11) $E = [(1 - \rho)/(1 + \gamma)]X_F + X_L - [(\rho + \gamma)/(1 + \gamma)]\ L$

The central bank can thus permanently increase bank liquidity (E) by discounting more commercial bank loans, or, nowadays, by the means of open market operations. A currency board arrangement precludes this kind of monetary policy operation.

2- Bank liquidity and government deposits.

The standard approach to money supply totally ignores money held by the government, either cash or deposits. Money holding by the government could be justified along lines similar to the private sector demand for money, namely transaction and speculation purposes. However, the standard macroeconomic theory is build on the assumption that the private sector is a net lender and the public sector a net borrower on financial markets, so that it is consistent to consider that the private sector has to make monetary and financial portfolio decisions regarding the amount of money or securities. However, within this framework, it is quite difficult to consider that the government holds money on the same speculative basis as the private sector. Indeed, as a net borrower, like in

present day economies, the government should in priority repay the public debt instead of keeping idle monetary balances.

Assume that the government holds cash (C_G), deposits at the BNB (G) and in commercial banks (D_G). Let D_P denote the private sector deposits in commercial banks, and C_P denote cash held by the private sector. The fiscal reserve is the total amount of money held by the government:

(12) $M_G = C_G + G + D_G$.

Denoting by E the amount of bank excess reserves, the balance sheets of the central bank (equation 13) and the commercial banks (equation 14) now imply:

(13) $X = C + R + E + G$
(14) $L + R + E = D_P + D_G$

Where:
(15) $C = C_P + C_G$
(16) $R = R_P + R_G$

Five different types of money can be distinguished, according to the issuer and the holder (see table 1). Usually, government deposits are included in broad money. But government deposits at the Central Bank are excluded from the monetary base[8]. Base and broad money are then defined as:

(17) $H = C + R + E$
(18) $M = C + D_P + D_G + G = M_P + M_G$

where M_P denotes money held by the non bank private sector, i.e. C_P+D_P.

Table 1: Five different types of money

Money		Held by			Total
		Private sector	government	Commercial banks	
Issued by	Central bank	C_P	$C_G + G$	R + E	H + G
	Commercial banks	D_P	D_G	-	D
Total		M_P	M_G	R + E	M + R + E

Note that cash held by the government (C_G) is formally identical to government deposits at the central bank (G): they are both money issued by the Central Bank and held by the government. Then, we could altogether ignore government cash, or consider that it is included in G. However, if we did, we would have to consider that moving the government deposits out of the central bank, a decision that we analyse below, also implies that the government no longer uses cash. Since the model is not so intricate that further simplifications are welcome, we keep government cash in our analysis.

The counterparts of broad money are obtained by aggregating the balance sheets of the central and commercial banks. They are, as before, loans (L) and foreign exchange reserves (X).

[8] In standard monetary analysis, which ignores the problems at hand, the monetary base records the total liquid liabilities (i.e. excluding equity) of the central bank. Here we follow the accounting standard of the IMF according to which government deposits at the central bank are excluded for the monetary base. See IMF, *Monetary and Financial statistics manual*, chapter VI.

Assume that desired cash and reserve to deposit ratios are given by:

(19) $R_P = \rho_P D_P$ and $R_G = \rho_G D_G$

(20) $C_P = \gamma_P D_P$ and $C_G = \gamma_G (D_G + G)$

where we assume that the ratios can be different across holders. In practice, this assumption may be reasonable for cash holding ratios, specifically $\gamma_G < \gamma_P$, because the administration tends to pay through checks or transfers, for example wages, where as private firms may more often still use cash. Regarding reserve ratios however, there is usually no discrimination regarding required reserves, so that ρ_G would be equal to ρ_P if desired reserves were always equal to required reserves[9].

In this model, desired and excess reserves (R and E), cash holdings (C_P, C_G), deposits (D_P), base and broad money, however defined (H, M, M_P and M_G) can be written as functions of government deposits (G and D_G) foreign exchange reserves (X) and loans (L):

(21) $M = L + X$

(22) $H = X - G$

(23) $D_P = [1/(1+\gamma_P)][L + X - (1+\gamma_G) (D_G+G)$

(24) $E = [(1-\rho_P)/(1+\gamma_P)] X - [(\rho_P+\gamma_P)/(1+\gamma_P)] L + (1-\rho_G) D_G - [(1+\gamma_G)(1-\rho_P)/(1+\gamma_P)][D_G+G]$

(25) $M_G = (1+\gamma_G) (D_G+G)$

(26) $M_P = (1+\gamma_P) D_P$

We consider loans (L) as illiquid, thus given in the "short" run. Broad money (M) is constant as long as foreign reserves (X) remain unchanged. The short-term effects, especially on bank liquidity (E), of movements in the fiscal reserve can now be made clear.

3- Movements in the fiscal reserve due to domestic payments:

We assume for the moment that:

i- there is no change in the balance of payments[10], so that $\Delta X = 0$;

ii- bank assets consist in liquid reserves at the central bank and illiquid loans, which remain constant over some short time period, so that we take the amount of loans as given: $\Delta L = 0$;

iii- γ's and ρ's, desired cash and reserve ratios, are given[11].

We study the effects of government payments and receipts that do not involve the foreign sector on commercial bank liquidity (E).

3.1- An increase in the government deposit in commercial banks ($\Delta D_G > 0$)

The increase in government deposits in commercial banks may be due to a tax receipt, privatization revenue, or increased borrowing at home[12]. It has a negative impact on private sector deposits (D_P) and a limited positive impact on commercial banks' excess reserves (E).

Assume for example that a tax payment of $T>0$ is made by the private sector to the government[13]:

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[9] Poole (1976) proposed that "US government deposits held in commercial banks would not be subject to reserve requirements" (p. 139).

[10] We analyze how changes in the fiscal reserve affect bank liquidity and money supply and its components, *ceteris paribus*.

[11] The ratios of desired reserves to deposits, ρ, may exceed the required reserve ratios.

[12] Borrowing abroad would induce an increase in the balance of payment and an increase in X, which we assume away for the moment.

[13] Alternatively, consider $T<0$ as a public expenditure paid to the domestic private sector.

(27) $\Delta M_G = -\Delta M_P = T > 0$
(28) $\Delta G = 0$

Then[14]:
(29) $\Delta D_G = [1/(1+\gamma_G)]\ T$
(30) $\Delta D_P = -[1/(1+\gamma_P)]\ T$
(31) $\Delta E = [(1-\rho_G)/(1+\gamma_G) - (1-\rho_P)/(1+\gamma_P)]\ T$

Private deposits decrease by $[1/(1+\gamma_P)]T$, and cash holdings by $[\gamma_P/(1+\gamma_P)]T$, whereas government deposits in commercial banks increase by $[1/(1+\gamma_G)]T$, and cash holdings by $[\gamma_G/(1+\gamma_G)]T$ according to the desired cash/deposit ratios. If the government holds less cash than the private sector, $\gamma_G < \gamma_P$, total bank deposits increase, so that, unless reserve ratio on government deposits were sufficiently higher than that on private sector deposits, bank liquidity increases. If we assume that the cash and reserve ratios are equal across sectors, then excess reserves are not affected by changes in government deposits due to domestic payments[15].

3.2- An increase in the government deposit in the central bank ($\Delta G > 0$)

Consider now that the domestic private sector makes a payment to the government deposit at the central bank. Equation (27) is still valid.

(27) $\Delta M_G = -\Delta M_P = T > 0$
(32) $\Delta D_G = 0$

Then[16]:
(33) $\Delta G = [1/(1+\gamma_G)]\ T$
(34) $\Delta D_P = -[1/(1+\gamma_P)]\ T$
(35) $\Delta E = -[(1-\rho_P)/(1+\gamma_P)]\ T$

Private deposits decrease by $[1/(1+\gamma_P)]T$, and cash holdings by $[\gamma_P/(1+\gamma_P)]T$, whereas government deposits in the central bank increase by T. Total bank deposits and bank liquidity decrease.
Banks face a liquidity shortage equal to the difference between the actual variation in deposits and the decline in desired reserve.

Payments made by the private sector to the government on deposits at the central bank increase the banks' need for liquidity (i.e. decrease banks' excess reserves), and vice versa. This phenomenon is well known and explains a large part of the volatility in overnight interbank interest rates, through what the ECB calls an "autonomous factor of the liquidity needs of the banking system", and the FRS calls "technical factors influencing nonborrowed reserves"[17].

3.3- A pure transfer of the fiscal reserve from the central bank to commercial banks ($\Delta M_G=0$)

Assume that the government decides to transfer part of its deposits from the central bank to commercial banks, without changing the amount of money it holds ($\Delta M_G = 0$). The transfer implies:

(36) $\Delta D_G = -\Delta G > 0$

[14] Use (27), (28) and (25) to get (29), then (29) and (23), resp. (24), to get (30), resp. (31).
[15] The model considers banks as a whole, but, of course, unless the distribution of government deposits in individual banks exactly matches that of tax payments to be made, there will be activity in the interbank market.
[16] Use (27), (32) and (25) to get (33), then (33) and (23), resp. (24), to get (34), resp. (35).
[17] See e.g. ECB (2002) and http://www.ecb.int/mopo/implement/liq/html/index.en.html, the webpage of the European Central Bank on liquidity management, *The Federal Reserve System: Purposes and Functions* chapter 3, p. 38, and Chobanov & Nenovsky (2004) for the case of Bulgaria.

We then have, using (36) and in (23), and (24):

(37) $\Delta D_P = 0$

(38) $\Delta E = (1-\rho_G)\,\Delta D_G > 0$

The transfer would have no impact on private deposits, because it simply does not involve any movement in private deposits. However, bank liquidity (excess reserves E) is positively affected, since bank liabilities (D_G) increase more than assets (R_G).

As a consequence, the distribution of the fiscal reserve can be used to smooth bank liquidity. For example, in the case of a tax payments T, which consists of transfers from private sector deposits by $[1/(1+\gamma_P)]T$, and cash holdings by $[\gamma_P/(1+\gamma_P)]T$ to government deposits (so that $\Delta M_G = T$), bank liquidity is unaffected[18], if and only if $\Delta E = 0$, where, from (24):

$$\Delta E = (1-\rho_G)\,\Delta D_G - [(1+\gamma_G)(1-\rho_P)/(1+\gamma_P)][\Delta D_G + \Delta G]$$

Solving $\Delta E = 0$ and $(1+\gamma_G)\,(\Delta D_G + \Delta G) = T$ for ΔD_G and ΔG, yields:

(39) $\Delta D_G = [1/(1-\rho_G)]\,[(1-\rho_P)/(1+\gamma_P)]\,T$

(40) $\Delta G = [1/(1-\rho_G)]\,\{[(1-\rho_G)/(1+\gamma_G)] - [(1-\rho_P)/(1+\gamma_P)]\}\,T$

Assuming that the government cash holding ratio is smaller that the public sector's, $\gamma_G < \gamma_P$, and that banks' desired reserve ratios, ρ_G and ρ_P, are not very different, the sign of ΔG is the same as the sign of T (equation 40). With a positive T, as in the case of a tax payment, both government deposits increase, and, in order to smooth bank liquidity, the government deposits in commercial banks increase more than government deposits at the Central Bank.

4- The fiscal reserve and the Balance of Payments

4.1- Monetary consequences of transactions with non-residents.

Payments involving the non-residents will have an impact not only on domestic deposits, but also on the balance of payments, thus on foreign exchange reserves (X). Any real or financial transaction reported in the balance of payments accounting has a monetary counterpart. When the home private sector cashes in a payment from the rest of the world, which may be due to exports of goods, sale of securities, then, from (23) and (24), private sector deposits and commercial bank excess reserves increase:

(41) $\Delta D_P = [1/(1+\gamma_P)]\,\Delta X$

(42) $\Delta E = [(1-\rho_P)/(1+\gamma_P)]\,\Delta X$

Similarly, some payments settle transactions between the government and non-residents, such as privatization of state-owned enterprises to foreigners, foreign indebtedness or foreign debt repayment. For the sake of argument, assume that the government privatizes a state-owned company, which is bought by non-residents. Such an operation implies a simultaneous increase in the fiscal reserve and in the balance of payments.

Denote by Π the privatization receipt. According to the scenario we have just described:

(43) $\Delta X = \Delta M_G = \Pi$.

[18] The caveat in footnote 15 still applies. See Acheson (1977), especially p. 448, for a discussion of the allocation of government deposits in Canadian commercial banks in the 1960s and early 1970s.

Following equation (24) the effect on commercial bank liquidity depends on the distribution of the fiscal reserve. Using (25) and (43) in (24) yields:

(44) $\Delta E = (1-\rho_G)\,\Delta D_G$

Bank liquidity increases immediately inasmuch as government deposits in commercial banks do. However, there may be second round effects, as privatization receipts are used by the government.

a- If privatization receipts are used to repay foreign debt, then incoming flows are offset by outgoing flows, so that bank liquidity is eventually unchanged.

b- If privatization receipts are used to settle new expenditures, then the new government money ($\Delta M_G = \Pi$) is transferred to the private sector, which yields an increase in bank liquidity, along the lines in section 3.1 and 3.2.

c- Privatization receipts could also be used to increase foreign exchange reserves (X) if they were kept in government deposits at the central bank or transferred to the central bank in order to raise equity.

4.2- Sterilizing balance of payment fluctuations

The distribution of the fiscal reserve can be used to sterilize balance of payment fluctuations, that is to prevent variations in the overall balance of payments, and foreign exchange reserves, X, to spill over to money supply, by first affecting bank liquidity. As argued in section 3.3, the distribution of government deposits can be modified to influence bank liquidity. In case of an external flow that translates into private sector deposits, according to (24):

(45) $\Delta E = [(1-\rho_P)/(1+\gamma_P)]\,\Delta X + (1-\rho_G)\,\Delta D_G - [(1+\gamma_G)(1-\rho_P)/(1+\gamma_P)][\Delta D_G+\Delta G]$

Then, bank liquidity is kept unchanged ($\Delta E = 0$) by moving government deposits ($\Delta D_G+\Delta G=0$) if and only if:

(46) $\Delta D_G = -\,(1-\rho_P)/[(1-\rho_G)(1+\gamma_P)]\,\Delta X$

A balance of payment deficit ($\Delta X < 0$) is sterilized by transferring government deposits from the central bank to commercial banks[19] ($-\Delta G = \Delta D_G > 0$). Obviously, this way of sterilizing balance of payment deficits is limited by the amount of government deposits available for transfer at the central bank (and in commercial banks in case of a surplus). It is easier to sterilize capital inflows resulting from government transactions by increasing government deposits at the central bank, as stated in the previous section.

4.3- Transferring the fiscal reserve abroad

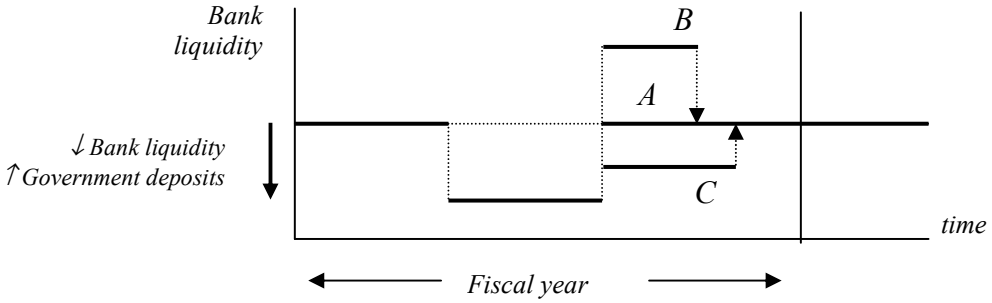
Consider a transfer of the fiscal reserve to a foreign bank, which has been advocated by some authors. Moving the fiscal reserve to a foreign bank would induce an immediate decrease in foreign currency reserves held in the banking system. The results of such a movement are described using equations (43) and (44), interpreting Π, now negative, as the transfer (purchase of foreign assets). Unsurprisingly, bank liquidity is negatively affected. This is one reason for keeping the fiscal reserve in the country. Moreover, it is clear that short term payments to the government affect bank liquidity in exactly the same way, when the fiscal reserve is located either in the central bank or in a foreign bank. This is another argument against locating fiscal reserves in a foreign bank: it would imply unnecessary short term volatility in foreign exchange reserves.

[19] This way of sterilizing balance of payment disequilibria is mentioned, but not detailed, by Mundell, 1961.

5- Is the fiscal reserve disturbing monetary policy?

The above analysis clearly shows that movements in government deposits due to domestic payments affect bank liquidity, all the more so when these deposits are located in the central bank. However, the effects of these movements in government deposits are bound to be temporary or, at most, asymmetric.

Figure 3: bank liquidity dynamics



Indeed, over the fiscal year, the flows into and out of government deposits must compensate, because they simply represent the monetary counterparts of the so-called government budget constraint, according to which the net increase in public debt equals total public deficit[20]. Assume for example that the government collects taxes before paying expenditures.
If the budget is balanced, the level of the government deposits is left unchanged after these two transactions have been completed: bank liquidity exhibits path A on figure 3, first decreasing as households and firms pay taxes, then increasing as the government pays expenditures.

If the government runs a budget deficit, then cumulated payments exceed cumulated receipts, so that the fiscal reserve decreases over the fiscal year. The fiscal reserve results from a kind of "liquidity in advance constraint", whether it lies in the central bank or in commercial banks. The government cannot afford to let it decrease, but should sell new bonds, which has exactly the same effect on commercial bank liquidity as taxes would have: the bank liquidity path would be like that labelled B on figure 3. In a Currency Board Arrangement, the central bank lends neither to the government nor to banks, so that there is no monetary source of deficit financing available. Direct financing by the central bank is precluded, and commercial banks cannot lend "from scratch" to the government, because they themselves face a liquidity constraint: in the model, E cannot be negative. Ultimately, the fiscal reserve *per se* should have no impact on financial conditions beyond the very short run: only the budget deficit counts. If the deficit is financed with foreign debt, then there is also an increase in foreign exchange reserves, which leads to a monetary expansion: it is the standard automatic adjustment mechanism in a fixed exchange rate regime.

If at last there is a budget surplus, then, the government is expected to repay its debt. The bank liquidity path would be as path C on figure 3. Because inflows to government deposits are higher than outflows, bank liquidity remains at a lower level, until at some point the government repays its debt. This is where the asymmetry property of the effects of government deposits on bank liquidity can be made clear. When the government runs a budget surplus, it could decide to increase its money holdings instead of repaying its debt. It would thus keep bank liquidity at a lower level than initially (see path C on figure 3). But there is no way for the government to permanently increase

[20] They may display a seasonal pattern, because of the specific timing of some receipts and disbursements.

bank liquidity. Indeed, the only way of increasing liquidity would be to reduce government money holdings, which can only be done after having accumulated them, thus first exerting the reverse effect on liquidity: the increase in liquidity would thus only consist in a restoration to a previously higher level.

What do banks do once they have noted an improvement in their liquidity?
A natural decision is to increase loans, as the traditional money multiplier mechanism suggests. Two points should be noted, in connection with the effects of movements in government deposits.

Firstly, if the improvement in liquidity is temporary, the increase in loans is bound to be temporary too. If commercial banks engage too quickly in credit expansion when they see their liquidity increasing because of government payments and receipts, they may face a tighter liquidity constraint once government payments and receipts have the reverse effects. They may then have to accept a temporary decrease in their desired reserves, before slowing down lending. Since the government is a 'large' customer, it is very important that the banking system should be able to forecast as accurately as possible its flows of payments and receipts.

Secondly, moving the fiscal reserve from the central bank to commercial banks need not induce any direct movement in foreign exchange reserve, contrary to what Hanke and Sekerke (2003) claim.
According to their analysis, after the government transferred its deposits (and foreign reserve counterparts) to commercial banks, banks transform foreign assets into domestic assets. Then, "the supply of broad money is still unchanged, but its composition is altered, with the foreign component contracting and the domestic component expanding" (Hanke and Sekerke 2003, p. 82). On the contrary, when part of the fiscal reserve is relocated in commercial banks, they expand loans to dry up excess reserves, so that money supply is expanding, with the foreign component unchanged. If the transfer of deposits implies an equal transfer of foreign exchange reserves, commercial banks can sell these undesired foreign exchange reserves back to the central bank.
Of course, the increase in the supply of loans (and money) has to have effects on the rest of the economy. In particular, as money supply is expanding, the balance of payments may deteriorate (Hanke and Sekerke 2003, p. 82). However:

a- these effects happen only once, if the transfer is permanent, and they bear on the level of monetary aggregates, not their rate of increase;

b- the currency board is far from being destroyed, contrary to Hanke and Serkeke's provocative analysis, because even after the transfer of the government deposit, the monetary base is still covered with foreign exchange reserves.

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