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**Dieter Duwendag/Thomas Gäckle**

**MONETARY IMPLICATIONS  
OF PUBLIC SECTOR BORROWING  
IN GERMANY, 1974 – 1989**

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## I. INTRODUCTORY NOTES

This paper originated in the context of a research project on budgetary implications of a future European Economic and Monetary Union (EMU), carried out by *Thomas Gäckle* at the Research Institute of Public Administration Speyer from 1989 to 1992.<sup>1</sup> Originally, it was planned to include into the project the monetary implications of budgetary deficits as well. Due to statistical deficiencies, however, this aspect could not be investigated empirically for all member states of the European Community (EC), so that the tests had to be restricted to (West-)Germany and thus were separated from the project.

This study also draws on the draft of a paper by *Dieter Duwendag*.<sup>2</sup> It was presented at a conference of the HWWA-Institut für Wirtschaftsforschung, Hamburg, on "Government and Central Bank in Italy and Germany in the Light of the Move towards EMU" in May 1990. Valuable comments from conference participants helped to revise the first draft and are gratefully acknowledged.

The title of this paper, i. e., "Monetary Implications of Public Sector Borrowing", addresses in its empirical section the following three issues:

- 1) The effects of public sector credit demand on the Deutsche Bundesbank's **strategy of controlling monetary aggregates** (money supply targets),
- 2) the impact of public sector borrowing on long-term nominal and real **interest rates**,
- 3) the **crowding-out** issue.

The empirical tests were carried out for the period 1974-1989, that is for the period **prior** to German unification (1990). In the aftermath of that unique event public sector indebtedness in (united) Germany grew

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1 See *Th. Gäckle*, Die Weiterentwicklung des Europäischen Währungssystems zur Europäischen Währungsunion, Baden-Baden 1992.

2 See *D. Duwendag*, The Rise in Government Debt, the Financing of Budget Deficits and their Monetary Implications in Germany, Speyer 1990 (mimeo).



intensively. It was to a large extent determined by the necessity to finance the ever increasing transfers from West-Germany to the eastern part, i. e., to the five new Länder. **German unification** completely changed the monetary and budgetary scenario hitherto experienced and did not allow meaningful empirical tests of the variables considered in this paper. As a consequence of German monetary unification mainly the following variables were affected:

- **Money supply:** In the wake of **German Economic, Monetary and Social Union** of Juli 1, 1990, a drastic once-and-for-all jump emerged in the money supply which was followed by an overshooting of the M3-target in the years to come.
- **Interest rates:** Interest subsidies of substantial amounts granted by the Federal Government and by Federal banking institutions in order to foster the process of restructuring and development in the new Länder led to distortions in the capital market, thereby hiding the "true" costs of private credit demand and corporate finance.
- **Investment behavior:** Real capital formation of private enterprises (in West-Germany) rapidly increased due to the push of consumption and investment expenditures in the new Länder.

Mainly for these reasons the period under review was restricted to the span from 1974 to 1989. Within this period the following two phases are considered: First, the "**deficit spending phase**", ranging from 1974 to 1983 and characterized by a huge increase in public sector borrowing in Germany; second, the post-1983 "**consolidation phase**" which lasted until 1989 and showed a marked decline in net new public sector credit demand.

Due to these time-restrictions, the period under review in this paper does not cover the phase of the conclusion of the so-called **Treaty of Maastricht**. Meanwhile, this "Treaty on European Union" was agreed upon by the twelve EC member states in Maastricht in December 1991 and signed in February 1992. The Treaty of Maastricht, inter alia, provides for the creation of an EMU and a European Central Bank (ECB) prior to the end of this century. The Treaty will presumably come into force by the fall of 1993 after its ratification by all member states. For

the time being, there are only the United Kingdom's and the German Constitution Court's decisions still outstanding.

The terms of the Maastricht Treaty provide for a set of **criteria for entry** (or convergence) to be met by each member state in order to enter into the final stage of EMU. Among these criteria there are two that refer to budgetary policy and that are investigated in more detail in this paper, namely the requirements that (1) the (national) current budget deficit-to-GDP ratio must not exceed 3 % and (2) the overall public sector debt-to-GDP ratio must not exceed 60 %. While both criteria were fully satisfied by (West-)Germany in the years prior to German unification, the **budget deficit ratio** increased since then to about 5 – 6 %, thereby far exceeding the upper limit as set out in the Treaty. Similar holds for a number of other EC member states, even though (of course) for other reasons, namely because of wide-spread economic recession in most member countries in the past few years. As a consequence, the Governments of these states reactivated the instrument of deficit spending in order to stimulate economic upswing.

As is shown in this paper, empirical evidence on the monetary implications of public sector borrowing in Germany points to the fact that a "lax" budgetary and deficit policy can conflict with the monetary authority's objective to maintain price stability via controlling monetary aggregates. Of special importance in this context are the effects of budget deficit finance on money supply targets and long-term interest rates, both nominal and real. Provided that this evidence also proves true union- (EC-)wide the lessons from the German example should be taken into account. Public sector borrowing could exert pressure on the future ECB to relax its stability-oriented monetary stance and thus be a potential threat to the proper functioning of a future EMU.

## II. THE ISSUE

It is a well known fact that there are close interactions between monetary and fiscal policies and developments. In the context of this paper the focus is on a one-way direction, that is on the monetary implications of budget deficits and of the corresponding public sector borrowing requirements.

Basically, both private and public sector borrowing are the same phenomenon, that is domestic credit demand. Thus, both have to be judged – at least in principle – in a similar way, notwithstanding special features concerning the public sector credit demand to be discussed later. Since domestic credit is the main determinant of the money supply process, public sector borrowing can conflict with the Central Bank's strategy of controlling monetary aggregates. This is especially the case in Germany, where the monetary authority, the Deutsche Bundesbank, by and large is an independent body that explicitly does not pursue a policy of monetary accommodation of public sector borrowing requirements.

The crucial point is that public sector credit demand affects (or can affect) all those variables which the Central Bank targets or employs to control monetary aggregates: namely the monetary intermediate target and the longer-term interest rates through the credit mechanism, and in a more indirect way the short-term control variables of monetary policy, as far as the Central Bank is compelled to change its policy stance because of inconsistencies between monetary and budgetary policies.

Apart from such conflicts, public sector borrowing can well be conducive to the process of monetary control: for instance in phases of sluggish economic activity and of too moderate growth of the money stock or as a permanent component of providing the economy with additional money. Having said this, however, the following will confine to the problem of monetary conflicts.

There are at least three dimensions to which monetary distortions resulting from public sector borrowings are relevant:

- First, the **national** dimension: Because inflation is above all a monetary phenomenon and since the financing of excessive budget deficits can lead to an overshooting of monetary targets, the Central Bank's attempt to combat inflation might be complicated or undermined. Moreover, the crowding-out of private investment through expansionary fiscal policy is a potential threat.
- Second, the **European** dimension: Actually, inflation differentials between the countries participating in the Exchange Rate Mechanism of the European Monetary System (EMS) have played a decisive role for the numerous realignments in the past and hence impaired the stability of the system. The argument goes that poor budget discipline of certain member countries has contributed to this instability. As the "*Delors Report*" puts it: "The lack of sufficient convergence of fiscal policies as reflected in large and persistent budget deficits in certain countries has remained a source of tensions and has put a disproportionate burden on monetary policy."<sup>3</sup> The need for fiscal convergence, that is for consistent monetary and budgetary policies, is all the more necessary in a system of irrevocably fixed exchange rates as is designed for a future European Monetary Union (EMU).
- Third, the **international** dimension: Of particular importance seem to be the following three aspects: The size of budget deficits and the way they are financed are frequently used by market participants as an indicator for inflationary expectations, thereby possibly inducing international capital movements and speculative attacks on nominal and real exchange rates. Another aspect is that huge and persistent fiscal deficits may lead to or aggravate external imbalances by generating the phenomenon of so-called "twin deficits" on budget and current account (which is, by the way, not only the case in the USA). A third important aspect is that excessive budget deficits may force the Government to intensify foreign borrowing. This, in turn, may press the Central Bank to unduly high interest

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3 Report on Economic and Monetary Union in the European Community ("*Delors Report*"), in: Europe Documents, No. 1550/1551, April 20, 1989, numeral 5.

rates in order to attract capital inflows. The consequences of such a scenario might not only be unfavourable conditions for the domestic economy, but also a worldwide spread of the increase in interest rates, if the borrowing country under debate is "dominant".

The paper proceeds as follows: **Section III** briefly describes the conceptual framework, i. e. the basic relationships between alternative ways of financing budget deficits and the subsequent changes in the stock of money. **Section IV** reviews the long-term development of public sector borrowing and its financing structure in Germany. **Section V** presents some empirical evidence of the monetary implications of public sector credit demand (including the crowding-out case). Finally, **Section VI** provides a summary and an outlook regarding budgetary rules in the context of a future EMU.

### III. CONCEPTUAL FRAMEWORK

Figure 1 represents a simple accounting scheme showing in a stylized form the basic relationships between an increase in public sector indebtedness and the corresponding money stock increases. The focus is on changes in the monetary base (B) and in the broadly defined money stock (M3), both being the main aggregates of monetary targeting.

The results are encircled in order to make them immediately transparent. In the accounting scheme it is assumed that all transactions are carried out through the commercial banks. The term KPS is "credit to the public sector", irrespective of who the creditor is.

Considered are the four basic means of financing a budget deficit, that is through

- Central Bank finance,
- commercial bank finance,
- non-bank private sector finance and
- foreign finance.<sup>4</sup>

#### 1. Central Bank Finance

Through the first channel the Government finances an increase in its debt by borrowing directly from the Central Bank. Looking at the Central Bank account, we have an increase in both sides of the balance sheet by the same amount, that is in the credit to the public sector (KPS) and in its demand deposit (DPS). In the next step, the Government transfers its deposit to the commercial banks (thereby effecting a rise in the free reserves; FR) and simultaneously spends it to the private sector whose deposits rise (DPR). Associated with the latter transaction are currency leakages (CUR) and an increase in reserve requirements (RR), while the free bank reserves are reduced by an equivalent amount.

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4 For a similar distinction see *OECD* (ed.), *Budget Financing and Monetary Control*, *OECD-Monetary Studies Series*, Paris 1982, pp. 15.

At this point (after the "first round") the accounting demonstration stops, notwithstanding the fact that a secondary expansion of deposits is likely to take place, since the commercial banks' portfolio behavior is affected by the remaining holdings of free reserves. The expansionary process of bank credits and deposits will come to an end, when the free reserves are fully absorbed through additional cash and reserve requirements.

The result is – and this comes as no surprise – that Central Bank finance of budget deficits has the most powerful influence on the growth of monetary aggregates compared with the other alternatives of finance (except one case demonstrated in II, 1, b) of **Figure 1**): Both the monetary base and M3 have risen by the same amount after the "first round", and M3 will rise further in the subsequent process according to the credit and deposit multiplier mechanism. With respect to **market interest rates** there is likely to be a tendency of unchanged rates – a tendency of "even-keeling", as the Americans call this kind of Central Bank finance.

## 2. Commercial Bank Finance

Turning to the alternatives of Central Bank finance there is only one case which has comparable effects on the growth of monetary aggregates: That is subpoint 1b) of commercial bank finance, where additional refinancing at the Central Bank takes place. This case is – at least occasionally – highly relevant in Germany, and it is called the "take in tow-case", expressing that the Bundesbank is "taken in tow" by the commercial banks. If a bank grants a credit to the public sector, the Bundesbank cannot refuse additional provision with bank liquidity (free reserves), since the subsequent cash and reserve requirements must be met by the banks. In this sense the Bundesbank is "taken in tow" by the banks.

Even though the Bundesbank cannot prevent the monetary aggregates (B und M3) from rising, the Central Bank can and probably will raise the conditions of their lending rates which apply to the additional provision of bank liquidity, thereby signalling a tightening of its policy stance. With increasing short-term interest rates the latter will spread to the longer-term rates. Consequently, an overall tendency towards rising in-

terest rates is likely to occur, and this consequence is the most important feature in contrast to direct Central Bank finance. This tendency is all the more likely to materialize as the public sector is supposed to be interest-robust.

The remaining two subpoints of commercial bank finance yield the following outcomes:

- In the case of using **existing free reserves** (1a)), the banks' credit to the public sector only leads to an increase in M3, while the monetary base remains unchanged (B).
- The second subpoint considers the case of **substituting for other assets** in the banks' portfolio (2): This one can be labelled the "loaned-up-case", where banks have no free reserves available. However, if the banks do want to make extra loans to the public sector and at the same time want to avoid additional refinancing at the Central Bank, they are compelled to get free reserves released by selling existing assets to the non-bank private sector.

In the accounting scheme it is assumed that commercial banks' holdings of foreign assets (FA) are substituted for new Government debt. The result is that this substitution has no effect on neither the monetary base nor M3 (B, M3). The same holds to the extent that banks can raise their non-deposit liabilities that may finance additional lending without generating extra money (for instance by issuing special bank certificates, as is possible in Germany).

With regard to **interest rates** a tendency of rising market rates is very likely to occur, since in both cases the banks' and non-bank private sector's portfolio behavior is affected.

### 3. Non-Bank Private Sector and Foreign Finance

- a) The monetary effects of **non-bank private sector** finance (case III) depend very much on how private non-banks actually refinance the purchase of new Government debt. If it is financed by transferring bank deposits – as is assumed to be the "normal" case in the accounting scheme –, just a shift of ownership of deposits between



the private and the public sector will take place. In this case there won't be any immediate effects on the monetary aggregates.

On the other hand, if private non-banks finance the purchase of public sector debt by selling non-deposit assets, a substitution process affecting various types of assets can be expected. The result will be at least "ripple-effects" on interest rates in the financial markets and an upward pressure on market rates.<sup>5</sup>

b) In the last case of **foreign finance** (IV) we have very much the same picture as in the preceding one: If the Government

- sells its bonds to foreigners and
- uses the foreign currency proceeds to purchase domestic currency on the exchange market (say, from domestic importers paying with their domestic bank deposits), as is assumed in the accounting figure,

there won't be any immediate effects on the monetary aggregates. The result is again just a shift of deposits from the private via the public and back to the private sector (when the money is spent).

The crucial assumption is, however, that the Central Banks do not intervene in the exchange markets (that is, a floating exchange rate is assumed) which otherwise might well lead to money supply effects. Nor is an upward pressure on international interest rates taken into account, which might occur if the size of foreign borrowing is large by international standards.

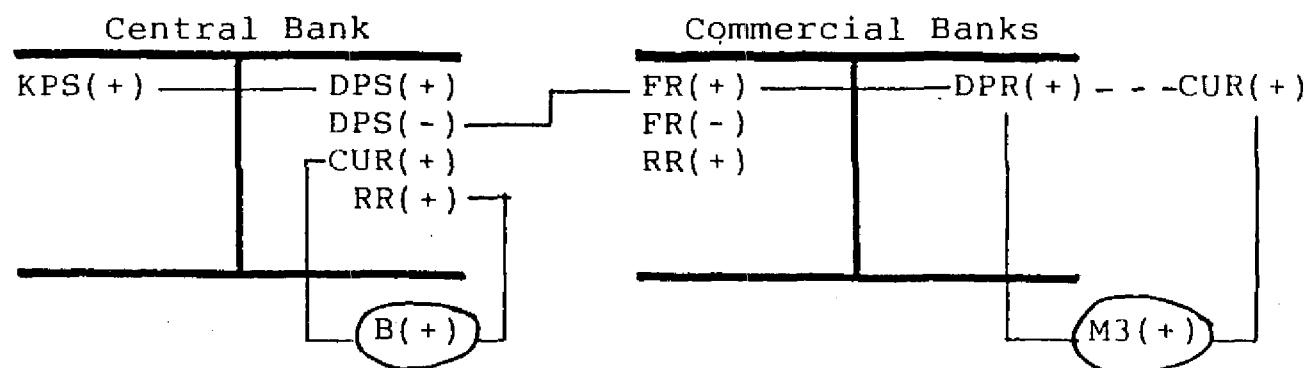
To sum up, under the ("normal") assumptions underlying the accounting scheme of **Figure 1**, there are expansionary effects on the monetary aggregates only in the case of Central Bank finance and in two sub-cases of commercial bank finance, the latter one being highly relevant in Germany (especially the "take-in-tow-case"). Almost all financing alternatives, however, have a more or less strong impact on interest rates, thereby affecting the transmission and/or control variables of monetary policy.

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5 See *OECD* (ed.), op. cit., p. 16.

Fig. 1: Alternative means of financing budget deficits

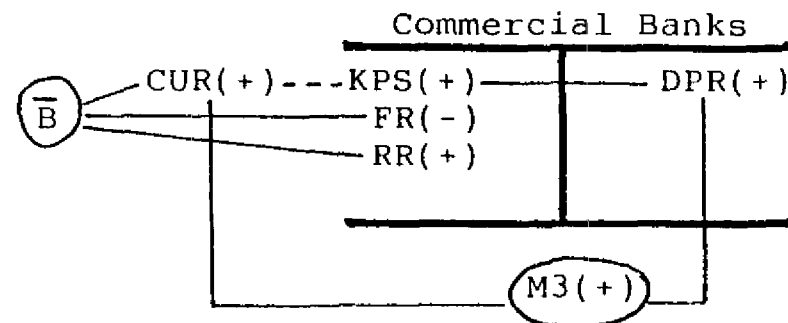
I. Central Bank Finance



II. Commercial bank finance

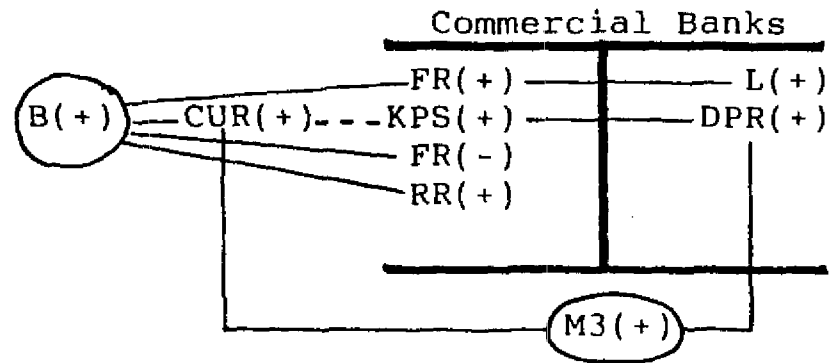
1. Addition to other assets in the banks' portfolio

a) Use of existing free reserves (FR)

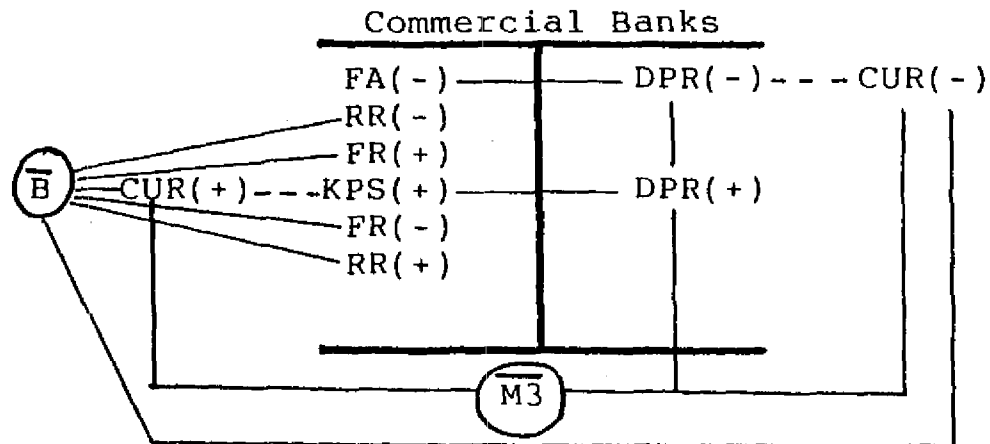


Continued (Figure 1):

b) Additional refinancing at the Central Bank

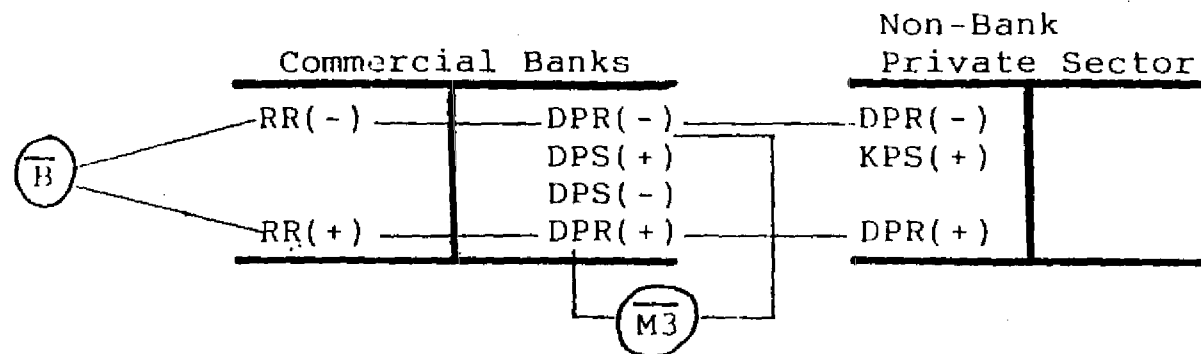


2. Substitution for other assets in the banks' portfolio

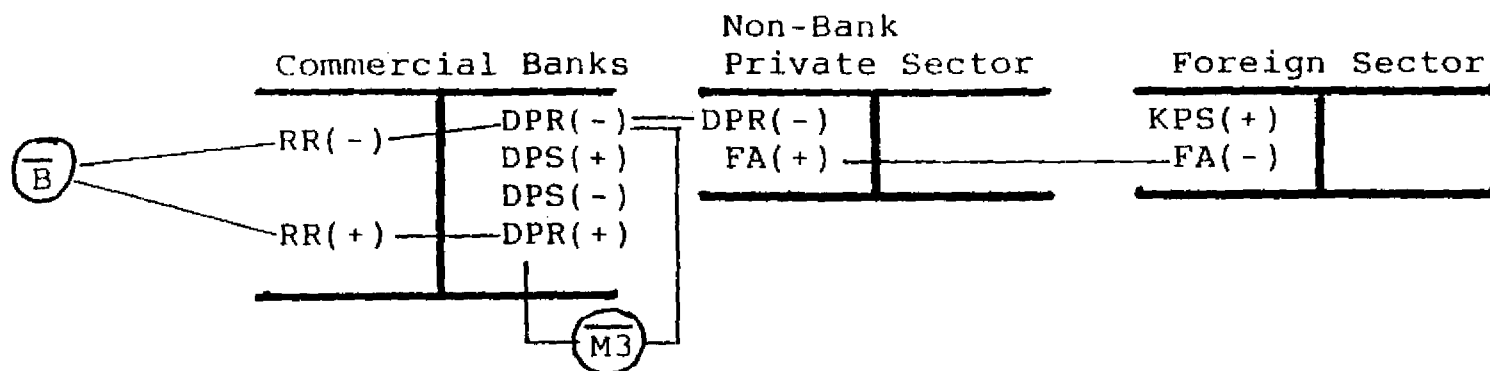


Continued (Figure 1):

### III. Non-bank private sector finance



### IV. Foreign finance



Symbols (Figure 1):

KPS : Central Bank, commercial bank, non-bank private sector or foreign sector credit to the public sector (including purchases of Government bonds)

DPS : Public sector deposits at the Central Bank or at commercial banks

CUR : Currency in circulation

RR : Reserve requirements

FR : Free reserves (commercial banks' holdings of disposable central bank money; "bank liquidity")

DPR : Private sector deposits at commercial banks

B : Monetary base

M3 : Broadly defined money stock comprising the non-bank private sector's CUR and demand, time and saving deposits at commercial banks

L : Commercial banks' liabilities against Central Bank

FA : Foreign assets (including holdings of foreign currency)

#### IV. EVOLUTION OF PUBLIC SECTOR BORROWING IN GERMANY

##### 1. The "Era" of Public Sector Debt

The start of the German postwar "era" of public sector borrowing can be fairly exact dated as on the turn of the years 1973/74. It lasted one decade until 1983, pushing net new public sector borrowing and outstanding debt to unprecedented high levels (this period is indicated by the two lines in Table 1). Thus, three different phases can be distinguished:<sup>6</sup>

- First, the **period until 1973**, when the year-to-year increase in public sector debt was very modest and quite below nominal GNP growth rates.
- Second, the **1974/83-decade** (the so-called "deficit spending phase") with debt increases of 15 % on average per year, thereby far exceeding nominal GNP growth rates: a period within which outstanding public sector debt quadrupled in only 10 years.
- Finally, the **post-1983 period** (up to 1989), which can be labelled as the "consolidation phase", with debt increases of about 6 % per year approximately marching in step with nominal GNP.

The decade of rapidly increasing public sector debt (1974 – 1983) was the "high time" of Germany's fiscal policy approach to macro-economic demand management. During this period there were four years of major recession and stagflation, partly induced by the two oilprice shocks, and this period coincided further with accelerating inflation and peak levels of unemployment. As will be discussed later, the start of this decade of extremely high budget deficits coincided also with the Bundesbank's transition to controlling monetary aggregates (1975).

According to the German "Stability and Growth Act" fiscal policy's reaction to these disturbances were massive deficit spending programs –

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6 For further details see *D. Duwendag, Staatsverschuldung – Notwendigkeit und Gefahren*, Baden-Baden 1983.

mounting up to 17 special programs to foster economic activity and summing up to a volume of more than 100 bn DM, debt financed and spent by the **Federal Government** alone in only 10 years. As can be seen "behind" the figures in **Table 1** (right hand side), additional programs were implemented by the **State Governments** as well, whose outstanding debt rose by a similar rate, that is by an average rate of 18 % per year. In contrast to that, the **Local Governments** were almost not involved in these programs (except 1974/75), keeping their debt increases at very low rates (**Table 1**).

The post-1983 **consolidation** of budget deficits was due mainly to three reasons:<sup>7</sup>

- First, the **general election** in 1982: During the campaign politicians had promised to stop the rapid expansion of public sector debt, thereby reacting to the general public's irrational, but nevertheless popular and wide-spread fears of a potential public sector "bankruptcy" and a "currency reform" of the DM.
- Second, the rapid rise in public sector **interest payments** turned out to be a crucial factor squeezing more and more the budget leeway.
- Third, there was **no visible evidence** at hand that the preceding costly programs had had any success (though it cannot be ruled out that at that time the economic situation might have been even worse if no programs had been implemented at all).

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7 See *E. Wille*, Zielkonflikte der Staatsverschuldung, in: Schriftenreihe Volkswirtschaft, ed. by "Die P.S.K.", No. 5, 1986, pp. 14.

Table 1: Public Sector Debt (PSD)<sup>1)</sup> in Germany, 1973-1989

	Total Public Sector Debt				Bundesbank Surplus Transfer (bn DM)	Increase in PSD by Government (% p.a.)		
	Outstanding		Increase			Federal	State	Local
	bn DM	% of GNP	% p.a.	% of GNP				
1973	167,8	18,3	7,5	1,3	-	8,4	6,8	7,0
74	192,4	19,5	14,7	2,5	-	15,1	19,7	10,9
75	256,4	24,9	33,3	6,2	-	46,1	41,6	12,0
76	296,7	26,3	15,6	3,6	0,4	17,5	22,1	7,3
77	328,5	27,4	10,7	2,7	-	15,2	9,5	4,4
78	370,8	28,7	12,9	3,3	-	16,9	14,0	4,1
79	413,9	29,6	11,6	3,1	-	14,1	13,5	4,3
1980	468,6	31,6	13,2	3,7	-	13,5	18,9	5,3
81	545,6	35,3	16,4	5,0	2,3	17,9	19,9	7,8
82	614,8	38,5	12,7	4,3	10,5	13,2	15,4	7,1
83	671,7	40,0	9,3	3,4	11,0	10,4	11,2	2,4
84	717,5	40,5	6,9	2,6	11,4	7,7	8,8	0,5
85	760,2	41,2	6,0	2,3	12,9	6,7	7,3	0,5
86	801,0	41,2	5,4	2,1	12,7	5,7	6,9	1,0
87	848,8	42,1	6,0	2,4	7,3	5,8	7,6	2,6
88	903,0	42,6	6,4	2,6	0,2	7,8	6,3	1,3
89	929,3	41,1	2,9	1,2	10,3	3,3	2,6	1,4

1) Liabilities of the Federal, State and Local Governments (including special parafiscal institutions, but excluding public corporations)

Source: Deutsche Bundesbank; own calculations.



Anyhow, after 1983 fiscal policy departed from debt financed demand management programs and moved toward the consolidation of budget deficits. Both developments can be interpreted as important steps towards a gradual transition to supply-side oriented fiscal policy.<sup>8</sup> This new orientation was facilitated by huge **Bundesbank surplus transfers** to the Federal Government at that time (Table 1). The consolidation process, starting in 1983, was associated with a rapid fall in the rates of inflation in Germany and with the proliferation of the D-Mark as the so-called "**stability anchor**" in the EMS. The conclusion can be drawn that budget consolidation in Germany might well have been conducive to the strengthening of this new role of the D-Mark within the EMS.

## 2. Financing Structure of Public Sector Borrowing

In concluding this section, the financing structure of public sector borrowing in Germany is displayed in Table 2: **Commercial banks** are by far the most important creditor with an average proportion of about 65 %. Over the last 10 years, however, there has been a marked fall in the banks' proportion from around 70 to less than 60 %. This gap was almost completely filled by an increase in the **foreign sector's** creditor position (partly due to the temporarily heavy current account deficits of Germany from 1979 to 1981), whereas the domestic **private non-banks'** creditor position remained relatively unchanged (around 18 %).

The latter "reflects the historically narrow non-bank market for Government debt" in Germany.<sup>9</sup> Traditionally, both private households and the corporate sector have a marked liquidity preference and risk aversion as regards their portfolio behavior. In an effort to widen and deepen the non-bank market for public sector debt the Federal Government (in the 70ies) had tried to improve the term structure of debt instruments and to offer "innovative" (short-term and almost riskless) bonds to the general public. These attempts, however, by and large have failed, as can

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8 See *Bundesministerium der Finanzen* (ed.), *Aufgaben und Ziele einer neuen Finanzpolitik – Grenzen staatlicher Verschuldung*, Bonn, Dec. 1985, pp. 10.

9 *OECD* (ed.), *op. cit.*, p. 54.

be seen from the figures of **Table 2**. **Other** creditors are of no importance in financing budget deficits. This is especially true with respect to the **Bundesbank** which is not allowed to "monetize" budget deficits, that is to make outright purchases of newly-issued Government bonds. Federal and State Governments, however, may overdraw their Bundesbank accounts to a limited extent in order to bridge temporary cash shortages (so-called "cash credits").

Table 2: Financing Structure of Public Sector Debt<sup>1)</sup> in Germany

20

Public Sector Debt by Creditor (% share)						
	Total	Bundes- bank	Commercial Banks	Private Non-Banks	Foreign Sector	Other 2)
1973	100	6,9	64,5	21,8	2,1	4,7
74	100	5,3	65,9	21,7	2,3	4,8
75	100	5,1	67,9	19,6	2,8	4,6
76	100	3,8	68,2	21,3	4,6	2,2
77	100	3,0	69,1	20,4	4,3	3,2
78	100	3,0	70,8	19,3	4,1	2,8
79	100	2,4	71,2	19,2	4,7	2,4
1980	100	2,9	67,5	18,5	8,9	2,3
81	100	2,9	67,1	15,9	12,2	2,0
82	100	2,3	66,2	16,9	12,9	1,7
83	100	2,3	63,2	18,9	14,1	1,6
84	100	2,0	62,4	19,7	14,6	1,4
85	100	1,5	61,5	19,7	16,1	1,2
86	100	1,9	58,3	18,9	19,8	1,0
87	100	1,5	57,9	18,5	21,2	0,9
88	100	1,5	59,0	18,1	20,7	0,8
89	100	1,4	57,3	18,2	22,4	0,7

1) For definition see Table 1.

2) Social Security institutions.

Source: Deutsche Bundesbank; own calculations.

## V. MONETARY IMPLICATIONS OF PUBLIC SECTOR BORROWING: SOME EVIDENCE

The following empirical tests of the monetary implications of public sector borrowing are aimed at separating those monetary effects which can be ascribed to an increase in Government debt. In a system of interacting and interdependent variables this is not an easy job and quite often tantamount to a trial and error process. This is all the more true for the period under review which was characterized by a growing importance of the **external component**. Its main features were

- increased international capital movements, especially due to growing world-wide current-account imbalances and corresponding foreign borrowing activities, to which, in turn, large budget deficits undoubtedly had contributed,
- capital movements, which led to an extreme volatility of floating exchange rates, both in nominal and real terms, pressing the Central Banks to intervene very often in the foreign exchange markets with subsequent monetary effects.

Thus, the main problem was to discriminate between monetary effects stemming from domestic public sector borrowing on the one hand and from the external component on the other. In what follows, an attempt is made to develop some meaningful hypotheses and to test them empirically. The tests were carried out using simple OLS regressions; admittedly, however, the results are not overwhelming.

### 1. Money Supply Targets and Budget Deficit Finance

The first test regards the relationship between money supply targets and public sector borrowing. As already mentioned, the Bundesbank's transition to controlling monetary aggregates by and large coincided with German fiscal policy's "high-time" of demand management, the latter being primarily financed by commercial banks (average proportion of 60 %; see Section IV). Therefore, if any, then this kind of financing

budget deficits could be expected to have money supply effects (see Section III).

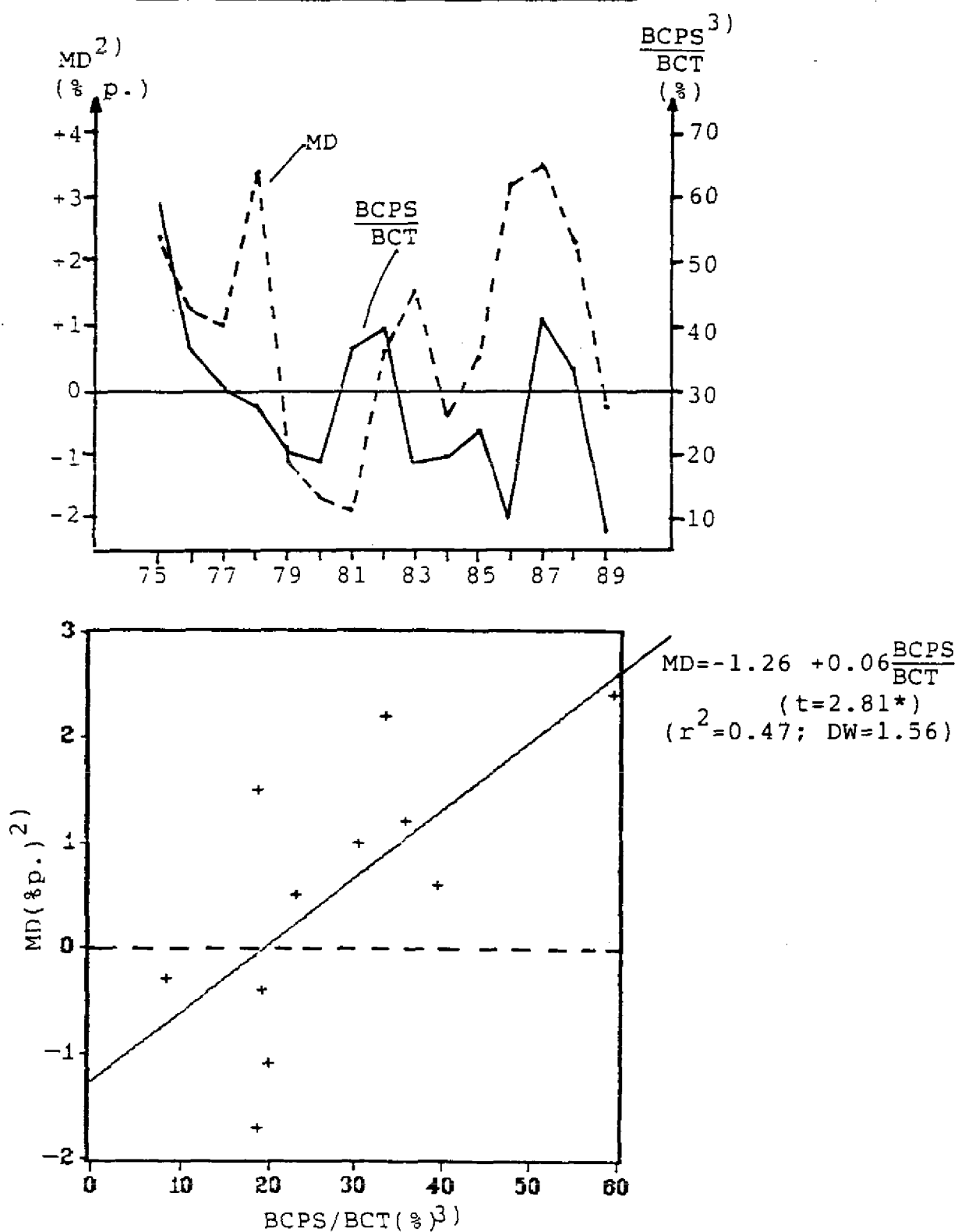
The hypothesis is that high net new public sector borrowing might have led to an overshooting of the Bundesbank's monetary targets – and vice versa (see **Figure 2**):

- **MD** is the dependent variable (measured as the actual deviation from the average money supply target in % points; see the zero-line); **BCPS/BCT** is the independent variable (commercial banks' net credit to the public sector as a percentage of total net bank credit to domestic non-banks).<sup>10</sup>
- The picture in **Fig. 2** (upper graph) is ambiguous: On the one hand, both time series show large fluctuations and over most years of the period a synchronous development which points to a basic **positive** relationship. On the other hand, however, the peaks and troughs of the MD-curve – these are the four phases of major over- and undershooting of monetary targets – do **not** correspond at all to the highs and lows of commercial bank lending to the public sector. These four extreme "runaway years" are 1978, 1981, 1986 and 1987. During these years very high foreign borrowing by the public sector (1981, 1986) and extraordinary increases in the Bundesbank's net foreign reserve position (1978, 1987) were mainly responsible for deviations from the money supply targets.

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10      The term "public sector" comprises the Federal, State and Local Governments in Germany.

Fig. 2: Money Supply Targets<sup>1)</sup> and Commercial Bank Credit to the Public Sector in Germany



1) 1975-87: CBM (Central Bank Money); 1988/89: M3.

2) MD: Deviation from average money supply target (in % points).

3) BCPS/BCT: Commercial bank net credit to the public sector as a percentage of total net bank credit to domestic non-banks.

\* ) Significant at a 2 % level.

Source: Deutsche Bundesbank; own calculations.

- Consequently, these "runaways" were omitted from the regression. The results are displayed in the scatter diagram below: a positive coefficient (the "correct" sign) and an acceptable significance, but a very low  $r^2$  (0.47).

## 2. Long-term Interest Rates and Public Sector Borrowing

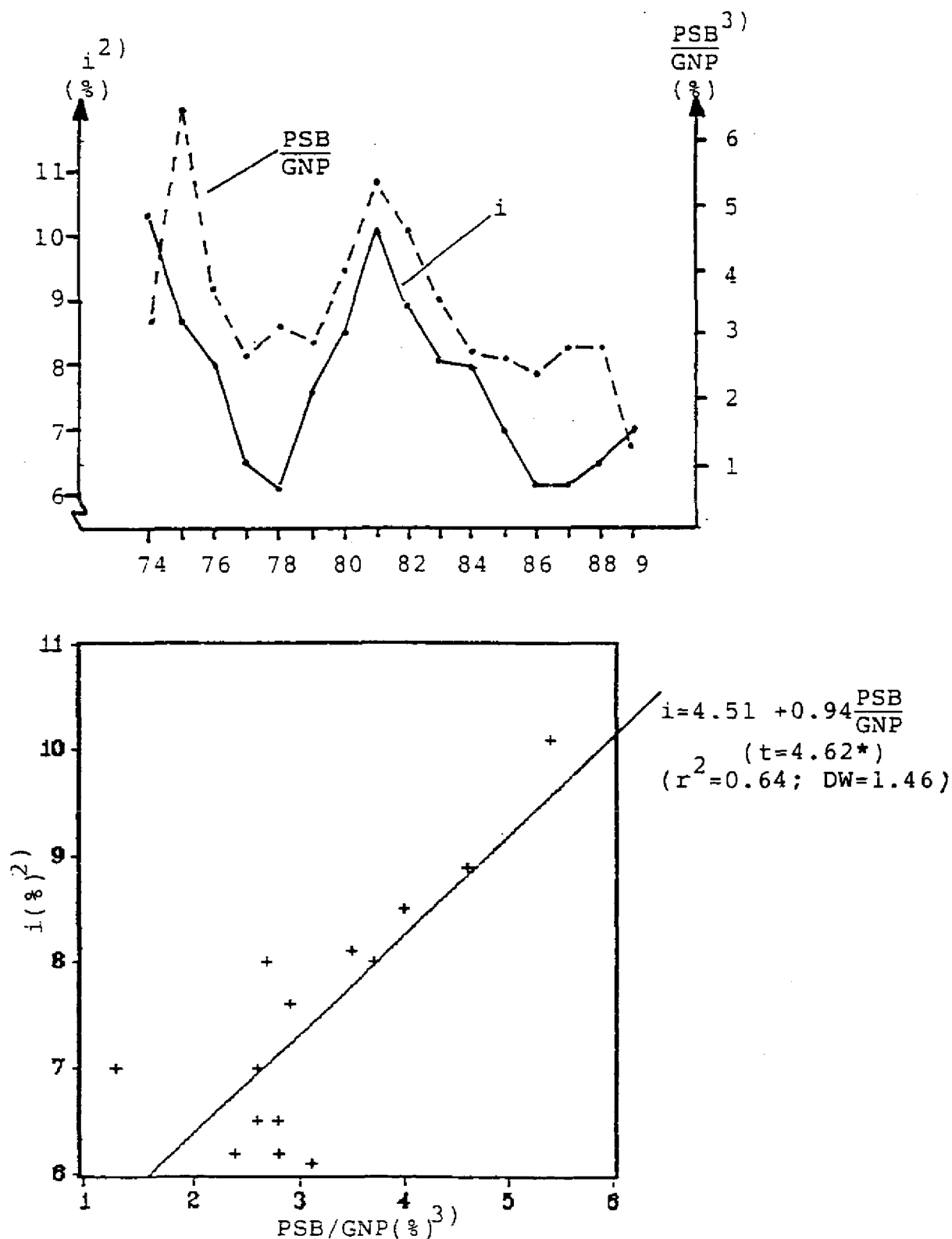
It is a wide-spread view that public sector borrowing exerts considerable influence on market interest rates. Such effects are very often regarded as the hard core of monetary implications of budget deficit finance. Actually, there can be little doubt that – c. p. – in the absence of public sector borrowing the level of interest rates would be lower.

In testing the hypothesis the following variables were employed (Fig. 3):

- Nominal long-term interest rates as dependent variable (i; Government bond yields with a remaining maturity of more than 7 years).
- Net (new) public sector borrowing as a percentage of nominal GNP as independent variable (PSB/GNP). Besides the Central, State and Local Governments the borrowing activities of certain para-fiscal institutions and of the German Federal Railway and Post Office were included, in order to get the most comprehensive figure of allegedly "interest-robust" public sector debtors.

The regression runs from 1976 to 1989. The years 1974/75 were left out, because in those years of postwar record inflation rates (7 %) the Bundesbank had pursued an extremely tight monetary policy. Even though public sector's indebtedness rose very fast in 1975, the high level of interest rates in those years must be in the first place attributed to the Bundesbank's restrictive policy stance.

Fig. 3: Long-term Interest Rates and Public Sector Borrowing (PSB)<sup>1)</sup> in Germany



- 1) PSB corresponds to the increase in liabilities of the Central, State and Local governments (including special parafiscal institutions, the Fed. Railway and Post Office).
- 2) Government bond yields with a remaining maturity of more than 7 years.
- 3) Public sector borrowing as a percentage of nominal GNP.
- \*) Significant at a 0,1 % level.

Source: Deutsche Bundesbank; own calculations.



The empirical evidence from Fig. 3 is quite clear-cut: Both the time-series from 1976 on and the scatter-diagram suggest a fairly close **positive** relationship between the two variables. In the regression the coefficient is positive and significant at a 0.1 % level, while the  $r^2$  seems acceptable, i. e. 0.64 which is relatively high by simple regression standards. From these findings the conclusion can be drawn that during the period 1976 – 1989 public sector borrowing was a major driving factor behind the behavior of nominal long-term interest rates, thereby affecting the decisive **transmission** variable of monetary policy.

### 3. Crowding-out Effects of Public Sector Credit Demand

The following empirical test deals with specific aspects of the crowding-out problem of private investment through public sector credit demand (Fig. 4). Previous investigations for Germany on this subject, covering the period from the early 70ies to the early 80ies, have yielded quite divergent results, mainly due to different methods employed in those studies.<sup>11</sup> While most authors reject any major crowding-out effects, the Bundesbank's and the OECD's findings – as important exceptions – support this hypothesis.<sup>12</sup> As the Bundesbank has pointed out most recently in the context of a EMU, "a proper degree of self-discipline of the public sector is necessary to prevent a 'crowding-out' of private sector finance, since the Governments are more interest-robust than private credit demand".<sup>13</sup>

A straightforward ("direct") measurement of the volume of crowded-out private investment through expansionary, debt financed fiscal policy seems impossible, because there are no data available providing ex ante

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11 For a survey see R. Caesar, *The Crowding-out Debate – The German View*, in: *Government Policies and the Working of Financial Systems in Industrialized Countries*, ed. by D. E. Fair/F. L. de Juvigny, Dordrecht et al. 1984, pp. 75 – 96.

12 See *Deutsche Bundesbank*, *Struktur und Eigenschaften einer neuen Version des ökonometrischen Modells der Deutschen Bundesbank*, in: *Monatsberichte der Deutschen Bundesbank*, No. 8, 1982, pp. 32, and *OECD* (ed.), op. cit., pp. 31.

13 K. O. Pöhl, *Grundzüge einer europäischen Geldordnung*, in: *Deutsche Bundesbank*, *Excerpts from Press Articles*, No. 4, Jan. 16, 1990, p. 5 (translated).

private investment **plans** that could be compared with **actual** investment activities *ex post*. (Such a comparison is well feasible with respect to public sector investment, however, it is not relevant in the context discussed here.) Thus, all previous approaches have attempted to measure crowding-out in an "indirect" way, that is above all via interest rate effects stemming from public sector borrowing influences on the financial markets ("financial crowding-out"). Likewise the following test follows this line, extending the period mentioned above from 1974-1989.

The approach is a multiple regression with two independent variables. The **dependent** variable  $INV/GNP$  (net private investment) is defined as net nominal capital expenditure (excluding changes in stock building) by private non-financial enterprises as a percentage of nominal GNP.

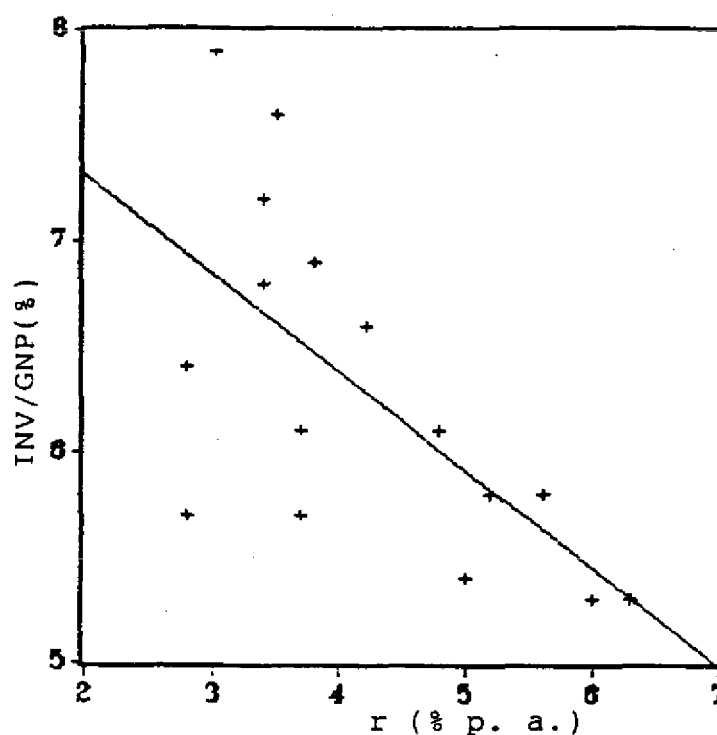
The first **independent** variable is the long-term real interest rate  $r$ , approximately calculated as the long-term nominal interest rate (as defined in Fig. 3) minus the rate of inflation (change in the consumer price index). The findings from the preceding section suggest that public sector credit demand can be considered as an important factor driving the development of long-term nominal interest rates. By the same token, public sector borrowing simultaneously influences the behavior of real interest rates (at existing rates of inflation), thereby affecting the opportunity costs of private fixed investment. In other words, with rising opportunity costs it becomes more attractive for private firms to invest in financial assets rather than in capital expenditure (and vice versa). The hypothesis then is that private capital expenditure is interest-elastic and reacts adversely to changes in the opportunity costs ( $r$  as proxy).

The second **independent** variable is net commercial bank credit to the public sector (BCPS) as a percentage of total net bank credit (BCT). (This variable has already been employed in Fig. 2). The rationale behind introducing BCPS/BCT as an additional argument refers to the **availability** of bank credit to the private sector as the most important source of financing private investment. Of course, the argument is not that private enterprises refrain from investing in capital expenditure simply because bank credit is not available (this depends on their interest sensitivity), especially since there are supplementary sources of fi-

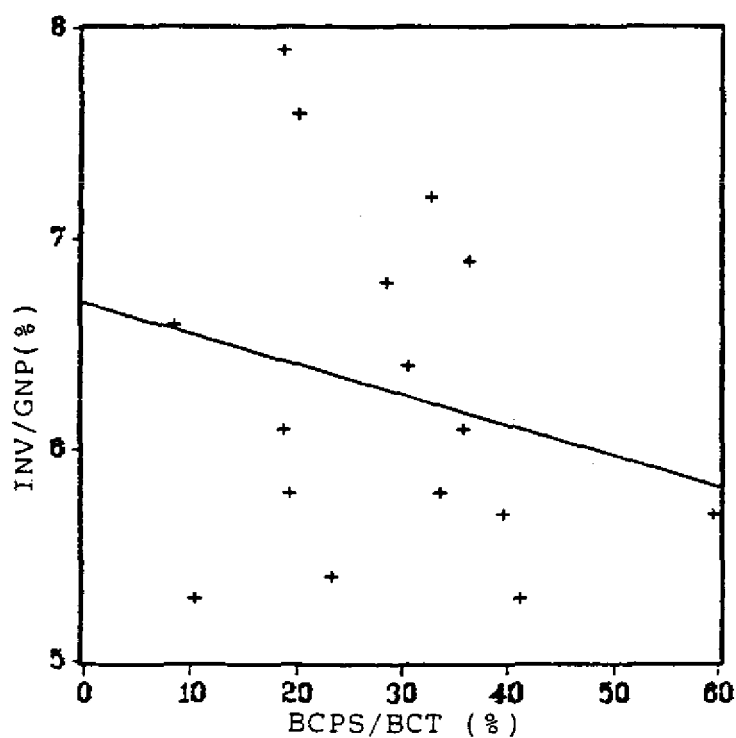
nance, for instance non-bank private sector finance and foreign borrowing. Rather, the argument is that periods of high and rising public sector borrowing will create tensions in the credit markets so that private investors might find it not that easy and frictionless to get commercial bank credit immediately. Moreover, it may show up to be more costly to fall back on substitute sources of finance. Consequently, such frictions may oblige private investors to postpone their credit and investment decisions. The hypothesis following from this suggests a negative correlation between private investment and BCPS/BCT.

Fig. 4: Crowding-out of Private Investment (INV)<sup>1)</sup> in Germany, 1974-1989

a) INV and Long-term Real Interest Rates (r)<sup>2)</sup>



b) INV and Commercial Bank Credit to the Public Sector (BCPS)<sup>3)</sup>



Crowding-out Hypothesis:

$$\frac{INV}{GNP} = 9.73 - 0.60r - 0.03 \frac{BCPS}{BCT}$$

(t=-4.88\*)(t=-3.05\*\*)

(r<sup>2</sup>=0.67; adj. r<sup>2</sup>=0.61; DW = 1.54)

1), 2), 3) For definitions see Fig. 2 and 3 and text.  
 \*), \*\*): Significant at an 0.1 and 1 % level, respectively.  
 Sources: Deutsche Bundesbank; own calculations.

The results of the regression are displayed in Fig. 4. From these findings and with regard to the two arguments the crowding-out hypothesis cannot be rejected: Even though  $r^2$  ( $= 0.67$ ) is relatively low, both coefficients are negative (as expected) and significant at an 0.1 ( $r$ ) and 1 % (BCPS/BCT) level, respectively. The DW-statistic seems also acceptable. From the scatter diagrams (Fig. 4) the relative weight of both arguments can be seen with the opportunity costs ( $r$ ) being the dominant variable, whereas the availability of bank credit argument adds only little explanatory power.

## VI. SUMMARY AND OUTLOOK

The 1974/83 decade can be labelled as the "era" of German postwar public sector borrowing. During this period, that is in only 10 years, the Federal, State and Local Governments' indebtedness quadrupled, primarily as a consequence of huge demand management and deficit spending programs. After that, fiscal policy in Germany gradually moved toward a consolidation of budget deficits with debt increases roughly marching in step with nominal GNP. This move was due mainly to three reasons: the growing debt service burden, the ambiguous effects of previous deficit spending programs, and the transition to supply-side-oriented fiscal policy.

Monetary implications of public sector borrowing can, in principle, consist of money supply and interest rate effects. The extent to which they actually arise depends on the way of financing budget deficits. In the paper, a conceptual framework of analyzing money supply effects is developed by means of a simple accounting scheme which takes into account alternative ways of budget deficit finance. From this framework the conclusion can be drawn that Central Bank finance and two important sub-cases of commercial bank finance lead to strong expansionary effects on the money supply, thereby affecting and possibly conflicting with the Central Bank's strategy of controlling monetary aggregates. Moreover, since almost all financing alternatives have a more or less marked impact on interest rates, public sector borrowing also affects the transmission and control variables of monetary policy.

Empirical tests of these monetary implications were carried out using simple OLS regressions. Several hypotheses were tested: the effects of public sector borrowing on (1) the money supply, (2) long-term nominal and real interest rates, (3) the investment behavior of private enterprises ("crowding-out hypothesis"). Even though the  $r^2$ s are relatively low, the coefficients and the high levels of significance point to the direction that public sector borrowing has had major monetary implications, thereby raising conflicts with the targets and stance of monetary policy.

These lessons from the German example should be taken into account in the process of shaping a future EMU. This holds all the more true, because there are several EC member states with fiscal imbalances and subsequent monetary effects by far exceeding those of Germany.<sup>14</sup> This was not only the case during the period under review, but also in the phase following the process of German unification since 1990. Such effects could be a persistent source of tensions and a potential threat to the creation of a future EMU<sup>15</sup> which – in the final stage – will be characterized by irrevocably fixed exchange rates between the member states and by a common "European System of Central Banks" ("ESCB") and an autonomous "European Central Bank" (ECB). Hence, European monetary unification undoubtedly requires some sort of fiscal coordination between the member countries, in order to safeguard an efficient functioning of a future EMU.

As regards the **Treaty of Maastricht** (1991/92) a set of fiscal criteria for entry or convergence was concluded by the EC member states. These criteria require a current budget deficit of not higher than 3 % of GDP and, in principle, an overall public sector debt of not higher than 60 % of GDP to be met by every member state in order to qualify for the final stage of EMU prior to the end of this century. Despite of these provisions set out in the Maastricht Treaty, however, the dispute over "market sanctions versus binding rules" for budget deficits is going on. Thus, this issue remains highly controversial, and the views on how to impose budget discipline differ widely.<sup>16</sup>

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14 For a comparison of fiscal indicators see *D. Folkerts-Landau, D. J. Mathieson, The European Monetary System in the Context of the Integration of European Financial Markets*, IMF-Occasional Paper, No. 66, Washington D. C. 1989 (Oct.), pp. 10.

15 See *J. de Larosière, European and Monetary Union: What is at Stake, and the Main Points at Issue between its Member Countries*, in: Deutsche Bundesbank, Excerpts from Press Articles, No. 23, March 19, 1990, pp. 1.

16 For a more comprehensive overview of the present controversy over "market sanctions versus budget rules" see *D. Duwendag, Towards a Viable Policy Mix: Are Adequate Rules Indispensable in a Future European Monetary Union?* in: *Europe on the Road to Monetary Union*, ed. by *M. Weber*, Oxford 1993, pp. 220.

In the **forefield** of the Maastricht Treaty the following extremely differing points of view could be distinguished:

- While the *Delors-Report*<sup>17</sup> advocated "**binding rules** ... in the budgetary field ... that would impose effective upper limits on budget deficits of individual countries ..., exclude access to direct central bank credit ... and limit recourse to external borrowing in non-Community currencies ..." (a view that was strongly backed by the **Bundesbank**<sup>18</sup>),
- the *European Commission* supported only certain "**ground rules**" to which the member Governments would have to agree (e. g., no Central Bank financing of fiscal expenditures, no "bail-out" of public finances of member countries by the Community)<sup>19</sup>,
- whereas many authors of the economics profession were more in favor of "**no rules**", that is that they relied on the power of the financial markets to penalise undisciplined fiscal budgets.<sup>20</sup> As *Norbert Kloten* put it: "What is required, is a training in a stability-oriented fiscal policy. This does not necessitate the very stringent coordination of national fiscal policies ..." <sup>21</sup>

The crucial point of these differences of opinion is the degree of fiscal autonomy that should remain at national level **after** having entered into the final stage of EMU. No doubt, that this is a far-reaching and politically sensitive point. In any case, however, in a future EMU compatibility of and consistency between monetary and budgetary policies will have to be granted: "As monetary policy is transferred to the Com-

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17 Report on Economic and ..., op. cit., numeral 30.

18 See *Deutsche Bundesbank*, Report for the Year 1989, p. 8 (German version).

19 See "EC Split on Remedy for Budget Deficits", in: *Deutsche Bundesbank*, Excerpts from Press Articles, No. 30, April 10, 1990, p. 13 (German version).

20 For a strong position see: *Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft*, Europäische Währungsordnung, in: *Der Bundesminister für Wirtschaft* (ed.), Studienreihe No. 61, Bonn 1989, pp. 22.

21 *N. Kloten*, One Currency for Europe? in: *Deutsche Bundesbank*, Excerpts from Press Articles, No. 49, June 18, 1990, p. 4 (German version).



munity level, it will be all the more necessary to ensure that it and fiscal policy are consistent."<sup>22</sup>

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22 *M. Doyle, Economic and Monetary Union, in: Deutsche Bundesbank, Excerpts from Press Articles, No. 22, March 16, 1990, p. 2 (German version).*

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