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Monetary assets and inflation induced
distortions of the national accounts

The case of the Federal Republic of
Germany

Helmut Wittelsberger *

Internal Paper



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ABSTRACT

This paper, which forms part of a series of studies undertaken by the task force on inflation accounting within Directorate-General for Economic and Financial Affairs, presents data on sectoral financial assets and liabilities in the Federal Republic of Germany for the period 1960-1981. The paper analyses the development and the structure of financial asset and liability positions of the different sectors, their composition by credit instrument and bilateral credit relationships between sectors; it comments on some key monetary asset and debt ratios. Redefining the concept of income to include the depreciation of monetary assets or liabilities due to inflation, the paper then adjusts key economic ratios, like the savings ratio of households, the government deficit, the self-financing ratio of the enterprise sector and the current external account, according to this wider concept of income. It is shown that the order of magnitude of these adjustments is substantial and that under inflationary conditions the trend of certain macroeconomic key variables as reported in traditional national accounts needs to be re-interpreted.

LIST OF CONTENTS

	<u>Page</u>
I. <u>INTRODUCTION</u>	4
II. <u>THE BASIC DATA</u>	5
Statistical sources	5
The structure of assets and liabilities	7
Composition of financial assets/liabilities by credit instrument	9
Bilateral credit relationships between sectors	15
Development in key monetary asset and debt ratios	17
Net monetary assets by sector	20
III. <u>SOME CONCEPTUAL ISSUES</u>	20
General remarks	20
Specific questions	24
IV. <u>ESTIMATES OF DEPRECIATION OF NET MONETARY CLAIMS OR LIABILITIES</u>	26
V. <u>ADJUSTMENT OF SIGNIFICANT MONETARY RATIOS</u>	30
Households	30
Enterprises	33
Balance on current account	33
Government	34
<u>APPENDIX</u>	41
<u>REFERENCES</u>	42

I. INTRODUCTION

This paper forms an integral part of the work of a task force within Directorate General for Economic and Financial Affairs to study economic phenomena under inflationary conditions.

Among the manifold questions to be raised when traditional propositions and practices are reviewed under conditions of inflation, the task force confined its work to the correction of sectoral income flows for inflation-induced biases on the real value of nominally denominated assets and liabilities of various sectors of the economy. This is an accounting phenomenon. The present study is only concerned with this aspect.

A second question not tackled here concerns the income redistribution due to inflation. The extent of this redistribution depends largely on the degree to which inflation is anticipated. With anticipated inflation, an inflation premium may be supposed to be included in the nominal interest rate, which is meant to compensate for the capital loss due to inflation(1). For the purpose of correcting the national accounts the question whether inflation was anticipated or not may be of some interest, but an isolated treatment of the accounting problem is of considerable interest in itself.

A main objective of the project was to provide comparisons between different countries. Consequently the structure of the present paper on Germany has been conceived with a view to comply with the multi-country nature of the project which apart from analyzing inflation accounting aims at presenting and comparing the financial structure of the different countries (2).

(1) As stated by the Fisher equation.

(2) The conceptual issues are dealt with in depth and the comparisons of the results of five countries are presented in Cukierman and Mortensen (1983). There may also be found a list of references of earlier studies on inflation accounting in the macro-economic context.

Chapter II of the present paper describes the development of financial assets and liabilities of different sectors of the economy since 1960. In Chapter III some conceptual issues of inflation accounting are raised. Chapter IV presents estimates of the depreciation of net assets or liabilities per sector induced by inflation. In Chapter V a number of significant macro-economic ratios like the savings ratio of private households and the budget deficit of general government are adjusted for these 'gains' or 'losses' due to inflation. It is shown that after these corrections have been made some of these ratios present a picture which is significantly different from that offered by the traditional measurement, which does not take account of inflation.

II. THE BASIC DATA

Statistical Sources

The Deutsche Bundesbank has been publishing data on total financial (3) assets and liabilities regularly since 1950 (4). The end-year figures are usually released in the Monthly Report of the Deutsche Bundesbank in May of the following year. The level of assets and liabilities are presented together with an analysis of the overall financial flows by sector in the year concerned.

The definition of sectors corresponds generally to the definitions used in the national accounts statistics of the Statistisches Bundesamt. Among the differences is the grouping of banks, insurance companies and building societies as a main sector called financial institutions, whereas these units form a sub-sector to "enterprises" in the national accounts statistics.

The following sectors are distinguished in the assets and liabilities statistics :

(3) For the purpose of the present study a distinction is made between financial assets/liabilities which include stocks and monetary assets/liabilities which exclude them.

(4) See Deutsche Bundesbank (1983)

- Private households (including private non-profit institutions)
- Non-financial enterprises
 - . enterprises except housing
 - . housing
- Government
 - . central, regional and local authorities
 - . social security funds
- Rest of the world
- Financial sectors
 - . banking institutions
 - . building and loan associations
 - . insurance enterprises.

With regard to comparability with other countries, the main particularity of this system of sectors is the wide definition of the enterprise sector. This sector comprises all units the main function of which is to produce goods and (non-financial) services for the market. Public enterprises are included as well as small businesses and independent professions, as far as their economic transactions concern production or investment. Besides, financial transactions of households for housing activities are reported in the enterprise sector. This may involve the splitting of economic units according to their activities and an assignment to different sectors.

Reasons for including all enterprises and not just companies in the enterprise sector are that financial transactions of enterprises are collected from balance sheets of financial institutions, where generally no specification as to the legal form of the enterprise is stated, and secondly that the non-company part of enterprises is relatively important in the German economy. The reason for including housing in the enterprise sector even if households are involved is - apart from the advantage to present this sector integrally - a practical one : statistics on financial activities in the overall housing sector are relatively reliable; but their splitting according to the group of purchasers or constructors of dwellings or houses is not possible due to lack of information. Hence the housing sector comprises the activities of housing companies as well as of households. Its financial assets are small but its debt is important, and the net liabilities of 'housing' are about as large as those of the rest of the enterprise sector.

In comparing the results for Germany with other countries it has therefore to be borne in mind that the private households transactions relating to the acquisition of dwellings are not reported in the series on the household sector. Data for the enterprise sector are generally presented in this study twice - for enterprises including and excluding housing. Hence the following sectors are distinguished, if not otherwise indicated : private households, non-financial enterprises including housing, non-financial enterprises excluding housing, financial institutions (banking institutions, building and loan associations, insurance enterprises), government, rest of the world. At a later stage, a new sector will be defined by shifting the central bank from the financial to the government sector; this redefinition serves to answer specific questions on the inflationary implications of the government deficit.

As to the credit instruments, the Bundesbank supplies data for 16 different items on both the assets and the liabilities side. Bonds and shares are at face values, but estimates of their value at market prices are presented as well. The system is complete, i.e. the sum of net assets and net liabilities over all sectors is zero. All items are in principle stated at end-year values.

The structure of assets and liabilities

Hand in hand with the expanding real economy in the last 20 years, the relative importance of the financial relationships has grown steadily. Table 1 shows that total gross financial assets were about twice the GDP in 1960,

Table 1
The development of credit relationships in Germany

Year	Gross financial assets in % of GDP
1960	209
1970	275
1980	342

Source : own calculation

but almost 3 1/2 times as high as GDP in 1980. These figures reflect the fact that the capacity to build up financial assets out of savings and issue debt has grown continually. The involved transfer of financial capital from savers to investors has indeed been one of the conditions for steady economic growth. Besides, the improving organisation of credit markets has also tended to raise these figures.

The degree of expansion of financial transactions was not the same for all sectors. As may be expected, the integration of the household sector in the network of credit relations has been the most pronounced in the course of these two decades. The share in the total assets of gross financial assets held by households has risen from 22% in 1960 to 28 1/2% in 1980 (Tables 2 and 3). The share of household liabilities in total liabilities doubled during the same period, but is still relatively low (2,7%), because consumer credit is less important in Germany than in other countries and since household debt related to the acquisition of dwellings is reported in the enterprise sector.

Table 2

Share of sectors in total gross financial assets

percentage

	1960	1970	1980
Households	21.9	26.2	28.5
Non-financial Enterprises	12.5	11.3	11.2
of which : excluding housing	12.4	11.2	11.1
Financial Institutions	43.4	45.2	46.4
Government	15.8	10.1	5.6
Rest of World	6.4	7.2	8.4

Source : calculated from Deutsche Bundesbank (1983)

Table 3

Share of sectors in total gross financial liabilities

	percentage		
	1960	1970	1980
Households	1.4	1.7	2.7
Non-financial Enterprises	38.1	37.3	33.0
of which : excluding housing	27.5	25.4	21.4
Financial Institutions	41.9	44.2	45.3
Government	8.5	6.7	9.7
Rest of World	10.1	10.1	9.6

Source : see Table 2

Enterprises other than housing diminished their share in total assets from 12 1/2% to 11% between 1960 and 1980, and from 27 1/2% to 21 1/2% on the liabilities side.

The increase in the banking sector's position on both the assets and the liabilities side (a bit less than 50% now in both cases) is another characteristic feature of a developing financial system.

Composition of financial assets/liabilities by credit instrument

The credit instruments used in the German economy are, as in any economy, manifold, and the composition of assets and liabilities varies according to the sector regarded. Table 4 gives an overview of the relative importance of the different instruments for the different sectors at the end of 1980. Households held one third of their assets in savings deposits; about 8 1/2% were in money (currency and sight deposits). Household saving via the constitution of funds placed with insurance companies is rather important (16.8%), the share of this form of saving being more than twice as high as saving through building associations (7.3%). Financial assets of households placed in bonds amounted to about 12% of total financial assets, whereas shares made up for no more than 4 1/2%. On the side of

Table 4
Composition of gross financial assets and liabilities by type of financial instrument, end-1980

	in % of the total									
	A S S E T S					L I A B I L I T I E S				
	House- holds	Enter- prises	Govern- ment	Financial institut.	Rest of the World	House- holds	Enter- prises	Govern- ment	Financial institut.	Rest of the World
Currency and sight deposits	8,4	24,5	4,7	0,2	5,8	-	-	-	14,2	-
Time deposits	10,7	17,8	50,3	3,7	25,8	-	-	-	27,5	-
Saving deposits	33,3	1,0	1,8	-	1,0	-	-	-	22,1	-
Funds placed with building assoc.	7,3	0,2	0,3	0,1	0,2	-	-	-	4,9	-
Funds placed with insurance enterprises	16,8	3,8	0,1	-	0,2	-	-	-	11,9	-
Money market paper	0,2	0,1	0,0	0,4	0,6	-	0,2	1,3	0,2	0,1
Bonds	11,9	5,0	5,4	11,3	5,0	-	1,4	20,4	15,7	6,1
Shares	4,4	21,6	11,7	2,4	13,2	-	14,5	-	1,9	9,3
Short-term bank loans	-	-	-	15,4	-	28,2	13,3	3,5	0,1	12,7
Long-term bank loans	-	-	-	53,1	-	63,8	42,0	62,0	0,3	20,0
Other	7,0	26,0	25,7	13,4	48,2	8,0	28,6	12,8	1,2	51,8
TOTAL p.m. in bn DM	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source : see Table 2

liabilities it may be noted that about 55% of the liabilities of the enterprise sector are bank credits, the larger part of which (42%) being long-term loans. For the Government sector, almost two third of debt is in long-term bank loans, due notably by the Länder and the local authorities to banks.

These remarks concern recent data. However, the composition of financial assets and liabilities has at some instances changed quite remarkably during the last twenty years, the changes reflecting institutional developments, general economic trends as well as policy action. Tables 5 to 9 present for each of the five sectors the main features of these developments. Looking at the households (Table 5), it is not surprising to see that financial wealth held in narrowly defined money has been declining in importance since 1960, its share going down from 14.3% to 8.4%. Time deposits, on the other hand, have become in the last couple of years an important form of financial wealth, reflecting both interest rate policies pursued by banks (savings deposits, characterized for the larger part by rather inflexible interest rates, being the loser) and improving financial sophistication of private households. The part of assets held in the form of bonds has increased remarkably, but the most outstanding feature is the drastic decline of the role of shares as an household asset - its share falling from 22.5% in 1960 to 4.4% in 1980. Taking together the rate of return and the risk, shares have been losing in competitiveness continuously against other forms of financial investment of households, for which they are imperfect substitutes. These figures underline the generally held view that there is now a shortage of risk-bearing capital, with adverse consequences for innovative investment and growth.

Liabilities of households are rather unimportant, as consumer credit is not very extended in Germany; however, household debts as a percentage of assets have risen steadily (9.2% in 1980, see bottom line of Table 5).

Table 5

Households : the development of the structure of gross financial assets, 1960-1980, as % of total

	1960	1970	1975	1980
Currency and sight deposits	14,3	9,9	8,9	8,4
Time deposits	1,3	2,7	5,0	10,7
Saving deposits	31,0	39,7	40,2	33,3
Funds placed with building associations	5,5	7,7	7,8	7,3
Funds placed with insurance enterprises	13,7	15,2	15,1	16,8
Bonds	3,4	8,1	9,6	11,9
Shares	22,5	10,4	7,0	4,4
Other	8,3	6,3	6,3	7,2
Total of assets	100,0	100,0	100,0	100,0
Liabilities as % of assets	5,4	6,1	6,6	9,2

Source : see Table 2

Table 6

Enterprises¹⁾: the development of the structure of gross financial assets and liabilities, 1960-1980, as % of total

	1960	1970	1975	1980
Assets :				
Currency and sight deposits	21,7	26,0	26,2	22,9
Time deposits	9,1	15,2	13,5	18,0
Bonds	3,4	3,7	3,4	5,0
Shares	43,5	27,4	26,0	21,8
Other	22,3	27,7	30,9	32,3
Total of assets	100,0	100,0	100,0	100,0
Liabilities :				
Bonds	3,5	3,5	3,2	2,1
Shares	47,8	28,6	25,4	21,3
Credit from financial institutions	32,6	46,5	47,5	51,6
Other	16,1	21,4	23,9	25,0
Total of liabilities	100,0	100,0	100,0	100,0
Assets in % of liabilities	44,4	43,7	46,2	51,4

1) Housing excluded

Source : see Table 2

Table 7

Government¹⁾: the development of the structure of gross financial assets and liabilities, 1960-1980, as % of total

	1960	1970	1975	1980
Assets :				
Funds placed with banks	55,0	63,0	58,3	60,0
Shares	21,7	15,0	15,1	15,1
Other	23,3	22,0	26,6	24,9
Total of assets	100,0	100,0	100,0	100,0
Liabilities :				
Bonds	10,8	14,0	16,9	19,7
Credits from financial institutions	67,9	74,5	66,7	69,3
Other	21,3	11,5	16,4	11,0
Total of liabilities	100,0	100,0	100,0	100,0
Assets as % of liabilities	154,6	116,3	76,0	48,4

1) Social Security Funds excluded
Source : see Table 2

Table 8

Financial Institutions : the development of the structure of gross financial assets and liabilities, 1960-1980, as % of total

	1960	1970	1975	1980
Assets :				
Bonds	7,7	10,1	10,9	11,3
Short-term bank credit	16,6	17,4	16,5	15,4
Long-term bank credits	45,9	50,1	49,7	53,1
Other	29,8	22,4	22,9	20,2
Total of assets	100,0	100,0	100,0	100,0
Liabilities :				
Currency and deposits with banks	69,5	68,0	65,8	63,7
Funds placed with building societies	3,5	5,1	5,3	4,9
Funds placed with insurance enterprises	9,7	10,6	11,0	11,9
Bonds	10,3	12,3	14,3	15,7
Other	7,0	4,0	3,6	3,8
Total of liabilities	100,0	100,0	100,0	100,0
Liabilities in % of GDP	89,6	120,6	140,5	154,3

Source : see Table 2

Table 9

Rest of the World : the development of the structure of gross financial assets, 1960-1980, as % of the total

	1960	1970	1975	1980
Assets :				
Funds placed with banks	10,5	23,7	23,6	32,7
Bonds	8,3	3,3	5,3	5,0
Shares	34,3	20,4	19,6	13,1
Other	46,9	52,6	51,5	49,2
Total of assets	100,0	100,0	100,0	100,0
Liabilities :				
Bonds	1,4	7,3	2,9	6,1
Shares	3,5	8,6	8,9	9,3
External position of the Bundesbank	52,5	27,4	26,2	16,6
Bank credits	5,8	25,9	30,2	32,7
Other	36,8	30,8	31,8	35,3
Total of liabilities	100,0	100,0	100,0	100,0

Source: see Table 2

The declining role of shares is also evident in the composition of financial liabilities of enterprises (without housing, Table 6) : shares (evaluated at market prices) as a percentage of total liabilities fell from 48% in 1960 to 21% in 1980. Bonds, which were never a major financing instrument, have diminished in the last ten years, representing only 2% of total liabilities of the enterprises sector in 1980. The issue of new bonds by companies has indeed almost lost any importance in the last few years. The item 'other assets/liabilities' in Table 6 is to a large extent made up of trade credits of enterprises to the rest of the world.

For the government sector (excluding social security funds) the most salient feature is the increasing role of bonds in financial liabilities. The percentage share of bonds almost doubled from 11% in 1960 to 20% in 1980 (Table 7). The reversal of the government sector's position from a net creditor to a debtor is reflected in the ratio of assets to liabilities, which fell from about 150% in 1960 to less than 50% in 1980.

Turning to the financial institutions, there is a slight shift of the composition of bank credits from short-term to long-term loans discernible (15,4% and 53,1% respectively of total financial assets in 1980, Table 8). Bonds as a percentage of assets increased as well (of which a part are bonds issued by other financial institutions, as bonds - and shares - are not consolidated). On the side of liabilities, the relative importance of bonds issued by financial institutions increased quite remarkably, their share rising from about 10% in 1960 to 16% in 1980.

The most pronounced changes during the last twenty years have occurred in the composition of financial assets and liabilities of the rest of the world. These trends reflect the development of international monetary relations. In 1960, shares of German companies held by foreigners were by far the most important single financial asset of the rest of the world (34,3%, Table 9), but in 1980, they made up for only 13,1% of the total. Their declining role was compensated by an inverse development of funds of foreigners placed with German banks. As to the liabilities of foreigners against Germany, twenty years ago more than fifty per cent of them consisted of liabilities of foreign monetary authorities to the Bundesbank. Ten years later, this percentage had been halved, and in 1980 it fell to 16,6%. Shares of foreign companies held by residents have become more important - contrary to what happened to shares on the foreigners' assets side. The holding of foreign bonds proves to be rather volatile - on both sides of the balance sheet of the rest of the world their percentage share in the total is quite instable.

Bilateral credit relationships between sectors

For inflation accounting it is irrelevant which sector holds the counterpart of the assets or liabilities held by a given sector. It would nevertheless be interesting to split claims or liabilities on a bilateral basis in order to see the inter-relations of sectors. Table 10 shows the results of an attempt to create a bilateral credit matrix between sectors for 1979. The main - admittedly strong - hypothesis which had to be used to create this matrix concerns bonds, as there is no information available on their distribution among

Table 10

Bilateral credit matrix between sectors, end-1979
 bn DM (central figure); left-side (right-side) figures : per cent of total liabilities (claims)

	Households	Enterprises	Financial institutions	Government	Rest of the world	Total of claims
Households	0,2	6,9	89,8	2,6	0,6	100,0
	2,4	89,4	1.166,0	33,9	7,4	1.299,1
	1,9	6,2	52,8	8,0	1,8	28,1
Enterprises	0,0	1,4	65,6	1,4	31,6	100,0
	0,1	6,6	316,9	7,0	152,7	483,3
	0,0	0,5	14,3	1,6	36,3	10,5
Financial institutions	5,4	50,3	16,9	16,2	11,2	100,0
	120,6	1.130,4	378,6	364,8	251,4	2.245,8
	96,5	78,6	17,1	85,9	59,7	48,6
Government	0,7	24,4	69,9	1,5	3,6	100,0
	1,9	64,5	184,9	3,9	9,5	264,7
	1,5	4,5	8,4	0,9	2,3	5,7
Rest of the world	-	45,5	49,9	4,7	-	100,0
	-	148,0	162,4	15,3	-	325,7
	-	10,3	7,4	3,6	-	7,1
Total of liabilities	2,7	31,2	47,8	9,2	9,1	100,0
	125,0	1.438,9	2.208,8	424,9	421,0	4.618,6
	100,0	100,0	100,0	100,0	100,0	100,0

Source : own calculations and estimates, based on Deutsche Bundesbank (1983)

holding sectors. Only the marginal distributions of bonds by issuing sector and by holding sector are known. In order to obtain figures for the amount of bonds issued by sector A and held by sector B it is assumed that the distribution of bonds held by sector B by issuing sector is the same as the distribution of all bonds by issuing sector. The same applies to money market paper and "other claims". The figures presented in Table 10 should therefore be interpreted cautiously.

Bearing these reservations in mind, some 90% of total household claims and almost all their liabilities were against financial institutions at the end of 1979. The enterprise sector held about two third of its claims (bn 317 DM) on financial institutions, and about one third on the rest of the world. Almost 80% of its liabilities (bn 1.130 DM) consisted of bank credits and related items, but liabilities against the rest of the world (10%), households (6%) and the government (4%) were also not negligible. As for the government, besides its claims on financial institutions (about two third of the total), credits extended to the enterprise sector made up to about one quarter of its total financial assets. The government's liabilities to households made up to 8% of total government's liabilities (bn 34 DM) and against the rest of the world about 3%. The rest of the world's claims against Germany consisted of claims against financial institutions and enterprises of roughly the same order of magnitude (50% and 48%, bn 148 and bn 162 DM). The bulk of foreigners' liabilities were to financial institutions (50%) and enterprises (36%).

Development in key monetary asset and debt ratios

The developments of the financial interactions within the economy are reflected by the ratios between net assets or liabilities of the different sectors and significant flow variables. Table 11 presents the trend of some key assets and debt ratios from 1960 to 1981. Net monetary assets of households have risen continuously in relation to annual disposable income, from 63,7% in 1960 to 138,2% in 1981 (first column of Table 11). This means that twenty years ago monetary wealth was equal to about eight months' income, whereas it covers now about 16 months' income of households.

Table 11
Key monetary assets and debt ratios 1)

	HOUSEHOLDS		ENTERPRISES		GENERAL GOVERNMENT		REST OF THE WORLD	
	Net assets % of disposable income	Net Liabilities % of gross operating surplus	Net assets % of GDP	Net assets of the nation, % of GDP	Net assets % of GDP	Net assets % of GDP	Net assets % of GDP	
1960	63,7	117,2	13,4	8,8	13,4	8,8	-2,1	
1961	65,9	129,0	15,6	9,2	15,6	9,2	- ,1	
1962	69,0	139,2	15,6	8,3	15,6	8,3	- ,0	
1963	73,8	150,2	15,6	8,3	15,6	8,3	- ,2	
1964	77,9	154,5	14,8	7,9	14,8	7,9	- ,1	
1965	80,6	163,1	12,8	6,1	12,8	6,1	- ,8	
1966	86,7	173,2	11,7	6,1	11,7	6,1	- ,8	
1967	94,8	177,2	10,1	7,8	10,1	7,8	1,0	
1968	98,4	169,5	8,8	9,1	8,8	9,1	1,4	
1969	99,5	180,3	8,9	8,0	8,9	8,0	3,4	
1970	101,1	185,9	8,2	7,7	8,2	7,7	,2	
1971	103,5	194,5	7,0	6,0	7,0	6,0	-2,0	
1972	106,0	199,8	5,8	6,2	5,8	6,2	-2,7	
1973	109,3	207,4	6,7	6,1	6,7	6,1	-3,7	
1974	114,7	214,7	4,7	7,7	4,7	7,7	- ,5	
1975	119,2	216,5	-1,1	8,7	-1,1	8,7	,5	
1976	125,4	202,5	-4,9	8,4	-4,9	8,4	,8	
1977	130,3	202,5	-7,6	7,9	-7,6	7,9	,5	
1978	132,5	196,7	-9,7	8,5	-9,7	8,5	,6	
1979	133,2	202,8	-11,2	6,0	-11,2	6,0	- ,7	
1980	133,7	220,0	-13,9	3,3	-13,9	3,3	-1,3	
1981	138,2	225,1	-17,9	2,1	-17,9	2,1	-2,3	

1) Assets/liabilities at end of year

2) Net assets of the nation minus official foreign exchange reserves
Source : own calculations, based on Deutsche Bundesbank (1983)

The ratio between the liabilities and gross surplus of enterprises may be considered as an indicator for the financial position of enterprises, a rise suggesting a deterioration. For the total enterprise sector this ratio went up continually during most of the 'sixties and the first half of the 'seventies (from 117% to 217%), among other things a reflection of the relative decline of risk-bearing capital (column 2 of Table 11). In the second half of the 'seventies, the ratio improved slightly, but it went up markedly in 1980 and 1981, to 225% : net debts were more than twice as high as one year's gross profits including depreciation allowances.

Net debts of the government as a percentage of GDP (column 3 of Table 11) show a remarkable development during the last twenty years. The general trend has been a deterioration of the government's financial position, starting as early as in the middle of the 'sixties. The government sector held net financial assets amounting to more than 15% of GDP in the early 'sixties. Net assets were dwindling rather regularly, and at the end of the recession year 1975, they turned sharply towards net debt, so that by the end of 1981 net government liabilities as a percentage of GDP amounted to 18 per cent of GDP.

Total net assets of the nation as a percentage of GDP have been rather stable over time, fluctuating between 6 and 9% from 1960 to 1979 (column 4 of Table 11). However, in the following two years they dropped substantially due to deficits in the balance on current account. Official foreign exchange reserves made up for the overwhelming part of net assets of the nation during the whole period. Excluding official reserves reveals that the level of net claims or liabilities was usually less than 1% of GDP (fifth column of Table 11), except in three periods : From 1967 to 1969 occurred a massive capital outflow, with claims of private sectors on foreign debtors accumulating, and the reverse happened from 1971 to 1973 and again in 1980 and 1981, when capital inflows were substantial.

Net monetary assets by sector

Inflation adjustment starts from the level of net assets of the different sectors of the economy. Table 12 presents net monetary assets or, with a negative sign, liabilities of six sectors from 1960 to 1981 in billion DM. Apart from rounding errors and disregarding enterprises net of housing, the sum of assets and liabilities of each year is zero. Households have of course always been by far the most important sector supplying financial funds, the value of this sector's assets at current prices being more than ten times higher in 1981 than twenty years ago. The outstanding debtor is the gross enterprise sector. Since 1974, contrary to what used to be true formerly, its liabilities have been short of the assets of the household sector. The compensating debt issuer has been the government (and in part, notably until 1978, the rest of the world) : the government sector had been a net creditor until 1974; since then it has accumulated quite a substantial part of overall debt (bn 277 DM in 1981).

III. SOME CONCEPTUAL ISSUES

General remarks

It was not before the second half of the 'seventies that the potentially misleading character of the traditional national accounts concepts in inflationary circumstances has attracted attention in economic literature (5). The problem was indeed not particularly acute before the worldwide upsurge of inflation rates in the early 'seventies.

The root of the problem lies in the definition of income in national accounts. Included are interest receipts and payments in the income and outlay accounts of creditors and debtors, regardless of whether or not nominal interest rates contain a premium to compensate for any depreciation of monetary assets and liabilities due to inflation. It is evident that with rising inflation rates and the fading away of money illusion, particularly since the early 'seventies, the component of nominal interest rates which was just considered as a compensation for inflation-induced losses on assets and gains on liabilities, has been rising. But these losses and gains are not included in the income of sectors as measured in the national accounts.

(5) See Cukierman and Mortensen (1983).

Table 12

Net monetary assets or liabilities (-)¹⁾ at end year, billion DM

	Households	Enterprises	Enterprises without housing	Financial Institutions	Government	Rest of the world
1960	119,6	-142,5	-71,6	-3,7	40,5	-14,1
1961	136,4	-165,2	-82,9	-6,9	51,7	-15,9
1962	154,6	-190,0	-94,3	-5,8	56,4	-15,1
1963	177,5	-215,0	-105,4	-5,7	59,6	-16,3
1964	204,8	-245,4	-120,0	-5,7	62,4	-16,0
1965	236,3	-280,7	-138,1	-4,1	59,0	-10,6
1966	269,5	-312,2	-152,7	-2,3	57,2	-12,4
1967	301,3	-327,4	-153,9	-2,0	49,9	-21,9
1968	337,8	-349,8	-163,1	-3,9	47,0	-30,9
1969	378,7	-400,4	-197,8	1,3	53,1	-32,8
1970	430,6	-454,0	-231,8	5,2	56,0	-37,9
1971	488,8	-512,9	-266,6	1,4	52,8	-30,0
1972	557,2	-575,4	-294,2	7,9	47,6	-37,3
1973	626,4	-651,2	-327,7	5,2	61,8	-42,3
1974	711,7	-703,7	-359,2	7,7	46,4	-61,9
1975	812,3	-742,9	-372,4	16,8	-11,3	-75,0
1976	904,3	-777,1	-387,3	8,5	-54,9	-80,6
1977	998,5	-828,2	-403,8	1,3	-91,1	-80,3
1978	1081,6	-871,7	-406,2	6,1	-124,1	-91,8
1979	1176,2	-975,3	-438,6	25,3	-156,5	-69,4
1980	1280,2	-1089,4	-495,2	50,7	-206,4	-35,1
1981	1409,5	-1190,7	-540,9	76,8	-276,5	-19,1

1) excluding shares, bonds are at market prices, monetary gold excluded

Source : Deutsche Bundesbank (1983)

An alternative, but equivalent way of stating this is to say that with present accounting practices the net creditor's income tends to be overstated in inflationary periods, because discounted future real income as reflected in the value of his monetary assets is diminishing, and this decline is not taken account of in his income account. Mutatis mutandis, the net debtors' income tends to be underestimated. The core of inflation accounting is to extend the concept of income in order to cover these effects. Income may be defined in the context of inflation accounting as "the maximum amount the individual can consume in any period, and still leave his end-of-period real net worth unchanged". (6)

The arguments for adjusting income as measured in the traditional accounts in this way do not rely upon whether inflation was anticipated or not. In both cases a depreciation of net assets has actually taken place and is not included in the traditional income measure. However, with anticipated inflation the traditionally measured income includes a compensation for this depreciation, and what inflation adjustment does in this case is to show on which level of income the behaviour of economic agents was in fact based. On the other hand, when inflation came as a surprise and was only realised ex post, inflation adjustment still reveals the correct level of income in the wider sense, but since agents ignored the true level in the period of question they consequently did not base their decisions on the adjusted income, but on the unadjusted one. In general, adjustment of national accounts without asking for the degree of inflation anticipation is justified in itself and may yield highly useful results; in a strict sense it is however not possible to draw from the results conclusions on behavioural trends of groups of economic agents(7). However, even without a rigorous analysis of the degree of anticipation it is obvious from a look at the trend of nominal interest rates that they include some inflation

(6) Jump (1980), pp. 994-995.

(7) A breakdown of the depreciation of monetary assets due to inflation into expected and unexpected components for five European countries is presented in Cuikerman-Lennan-Papadia (1983).

premiums and that these premiums tend to rise with inflation. For this reason some preliminary conclusions from the results of inflation adjustment on the behaviour of economic agents seem to be justified.

In Germany capital market rates use to be quite sensitive to current inflation. For the period 1960 to 1982 the correlation coefficient between the two variables is 0,8. In this context it is interesting to look at real interest rates as they developed in a critical phase, namely the - relatively - strong rise of inflation in 1973/1974 and its subsequent decline. One way for savers to protect themselves against uncertain prospects for inflation is to reduce the maturity of credit contracts. This is reflected in the average maturity of newly issued bonds, which shortened immediately when inflation accelerated around 1973/1974 and extended again in the subsequent years with decreasing inflation (Table 13). In 1973/1974 nominal capital market interest rates rose sharply, surely in part because the outlook for inflation became gloomy. But inflation slowed down in the following years, and the real interest rates of bonds issued in these years (nominal interest rates minus rise of consumer prices over maturity) proved to be very high (4,2% and 5,5% respectively). On the other hand, when inflation was low as in 1977/1978, nominal interest rates were low too, and the ex post real yield of bonds issued at this period was depressed by the subsequent acceleration of inflation.

Table 13
Real interest rates on newly issued bonds

	1973	1974	1975	1976	1977	1978
Average maturity in number of years	7,8	5,9	6,3	6,6	7,6	7,5
real interest rate over maturity, % p.a.	4,2	5,5	4,0	3,5	1,9(1)	2,0(1)
p.m.: real interest rate based on current inflation, % p.a.	2,1	2,8	2,8	3,6	2,3	3,5

(1) The underlying inflation rate is partly a forecast

Source : Statistische Beihefte zu den Monatsberichten der Deutschen Bundesbank, Reihe 2, and own calculations.

In the absence of knowledge about future price level developments 'real interest rates' are usually computed by deducting from the nominal interest rate of the year in question the inflation rate of the same year. A comparison between the real rates obtained in this way and the real rates as they effectively turned out for bonds newly issued between 1973 and 1978 shows that the former are no more than a rough estimate of the real outturn: they were considerably lower than the actual real rates in the high-inflation years, and higher in years with low inflation (Table 13, last line). This says of course nothing about the quality of the method using current inflation rates as an indicator of anticipated inflation.

Specific questions

- Tangible assets

The present study is - in line with the work programme of the task force - confined to inflation accounting related to monetary assets. Tangible assets are excluded from the analysis. The effects of the latter might be negligible only if their prices rise in line with the general price level. It is however well-known that the prices of certain tangible assets - i.e. the price for land - tend to rise in a different way: experience shows that a higher inflation rate raises the prices of such assets relative to the general price level. This might affect the analysis: assume a household whose monetary assets are depreciating due to inflation, but whose tangible assets are appreciating due to the same cause. Usually neither the depreciation nor the appreciation is recorded in his income account. Adjusting his income only by the negative effect from monetary assets means that the counterbalancing effect from tangible assets is disregarded. This restriction of the analysis certainly calls for a cautious interpretation of the results, but distortions stemming from credit relationships in the economy deserve attention on their own (8).

(8) In his inflation accounting study for Germany - which is restricted to one year (1980) - Lützel (1983) shows that the quantitative results are quite different when tangible assets are included or excluded.

- Price deflator

A major choice to be made in inflation adjustment concerns the kind of price deflator used to calculate the depreciation of assets and liabilities (9). The quantitative difference of adjustment using one or another deflator may be significant (10). In the present study one common price index - the consumer price index - has been used for all sectors. Using one index instead of several sector-specific indices has the advantage that the income adjustments over all sectors add up to zero - a result which should be expected from a correction of distortions stemming from a rise of the general price level. If different indices were applied to the individual sectors the results would not only reflect effects from inflation, but also from shifts in the terms of trade between sectors of the economy.

- Uniformity of price perceptions

Another measurement problem for inflation is the fact that probably not all economic agents base their decisions on the same rate of inflation. Knowledge about current economic trends and their implications for future inflation is unevenly distributed over the population; unlike wages, which are usually negotiated centrally by well-informed decision makers, interest rates for large parts of monetary assets - notably savings deposits - are set on markets where the suppliers of funds often play a rather passive role. When the ideas on future inflation or the perception of current inflation are not uniform, it is difficult to assess unambiguously the relevant inflation premium in an observed interest rate.

- Taxation of interest payments and receipts

As long as the aspect of income redistribution via inflation is excluded from the analysis, the distinction between pre-tax and after-tax interest rates is not relevant for inflation accounting. However, because the income adjustments resulting from the latter are bound to raise questions on redistribution, the treatment of interest payments and receipts in taxation is of considerable interest even in the context of inflation accounting.

(9) See Cukierman and Mortensen (1983), pp. 54/55.

(10) See Lützel (1983).

In Germany the tax rules are as follows :

- Interest payments of enterprises are treated as costs and are fully deductible from income. Interest payments of households are in principle considered as private consumption, hence no deductability. Since 1982 however, interest payments for financing the acquisition of homes are deductible in the first three years, up to an amount of DM 10.000,- (about USD 4.000).
- Interest receipts are fully taxable, for enterprises as well as for households. For the latter receipts up to a certain (modest) level are exempted from taxes. More important in practice is the fact that interest receipts from savings deposits and bonds are not taxed at the source but have to be declared as income by the recipient.

Tax rules do not provide for the distortions caused by inflation. To illustrate the effects involved when these rules interact with interest rates which include an inflation premium, suppose that an expected inflation rate of 4% goes together with nominal interest rates of 8%, which is not a very unrealistic setup for Germany. In this case a borrower's real after-tax rate of interest is 4% when he pays no taxes but 0% when his tax rate is 50%. Similar tax-induced distortions arise on the lender's side (11).

IV. ESTIMATES OF DEPRECIATION OF NET MONETARY CLAIMS OR LIABILITIES

In the following sections shares have been excluded from the analysis, as suggested in the general report. (In terms of our definition we are dealing with 'monetary' assets (liabilities)). Bonds are evaluated at their market prices, as in the descriptive part. Claims and liabilities denominated in foreign currency are all expressed in DM at current exchange rates.

(11) See Cukierman and Mortensen (1983), pp. 92-94, for a formal treatment.

To calculate the "gain" or "loss" of a sector due to inflation in year t , the arithmetic average of its net financial claims or liabilities at the beginning and the end of year t have been multiplied by the inflation rate of this year. To get the appropriate inflation rate of year t the arithmetic average of the index of consumer prices at the end of year $t-1$ and t is divided by the corresponding index of year $t-1$. The resulting amount in DM has been expressed as a percentage of nominal GDP at current prices in Table 14 for 1960 to 1980. The corresponding table showing the amounts in DM may be found in the Appendix.

It is not appropriate to call these results gains or losses due to inflation. The latter expression would indeed be misleading. In the absence of further analysis, it is impossible to decide whether these depreciations of financial claims or liabilities suffered or enjoyed by the individual sectors were compensated for by adjustments in nominal interest rates received or paid. In the German case it might well be found that income redistribution via gains or losses on monetary assets due to inflation have been relatively low not only because the German inflation rate has been relatively low, but because further changes in the inflation rate were in part anticipated and incorporated into nominal interest rates. The Bundesbank supported this process; at times it justified its (restrictive) monetary policy with the argument that a positive real interest rate had to be secured for the savers.

Looking back at the last twenty years, it may be argued that inflation-generated income redistribution was most important at the beginning or in the middle of the 'seventies. The boosting of inflation in these years was certainly to a large extent unexpected, and nominal interest rates failed to react promptly to the new inflationary environment. This may be true for other EC countries to a larger degree than for Germany (12). In the last couple of years, however, nominal interest rates seem to have reflected future inflation more promptly. Thus the amounts of depreciation of more recent years shown in Table 14 (and indeed those of the 'sixties, when inflation was more stable) cannot be compared without qualifications to those of the early and mid 'seventies, if one wants to talk about genuine gains or losses due to inflation.

(12) In Italy for example an official objective of interest rate policy in the middle of the 'seventies was to allow short-term rates to go up for the sake of the balance of payments, but to hold down simultaneously long-term rates to encourage investment.

Table 14
Depreciation of net monetary claims (-) and Liabilities, 1960-1981, in per cent of GDP

	Households	Enterprises total	Enterprises without housing	Financial Institutions	Government	Rest of the world	p.m. rate of inflation
1960	-0,4	0,4	0,2	0,0	-0,1	0,0	1,1
1961	-1,2	1,4	0,7	0,0	-0,4	0,1	3,1
1962	-1,5	1,8	0,9	0,1	-0,5	0,2	3,6
1963	-1,5	1,8	0,9	0,1	-0,5	0,1	3,4
1964	0,9	1,1	0,5	0,0	-0,3	0,1	2,0
1965	-1,9	2,3	1,1	0,0	-0,5	0,1	4,0
1966	-1,5	1,7	0,9	0,0	-0,3	0,1	2,9
1967	-0,4	0,4	0,2	0,0	-0,1	0,0	0,6
1968	-1,3	1,4	0,6	,0	-0,2	0,1	2,1
1969	-1,3	1,3	0,6	,0	-0,2	0,1	2,1
1970	-2,4	2,5	1,3	,0	-0,3	0,2	4,0
1971	-3,4	3,6	1,9	,0	-0,4	0,3	5,6
1972	-4,0	4,2	2,2	,0	-0,4	0,3	6,3
1973	-5,0	5,2	2,6	-0,1	-0,5	0,3	7,8
1974	-4,0	4,0	2,0	0,0	-0,3	0,3	5,9
1975	-4,0	3,8	1,9	-0,1	-0,1	0,4	5,4
1976	-2,8	2,5	1,2	0,0	0,1	0,3	3,6
1977	-2,7	2,3	1,1	0,0	0,2	0,2	3,4
1978	-2,0	1,7	0,8	0,0	0,2	0,2	2,5
1979	-4,3	3,5	1,6	-0,1	0,5	0,3	5,3
1980	-4,6	3,9	1,7	-0,1	0,7	0,2	5,5
1981	-5,5	4,7	2,1	-0,3	1,0	0,1	6,3

Source : see Table 2

A glance at Table 14 confirms what has to be expected from the distribution of claims and liabilities between sectors as shown in Table 12. Here again the sum of the five sectors' positive and negative adjustments add up to zero (disregarding rounding errors) (13)(14). The bulk of the shift is between households and the total enterprise sector, households suffering from depreciations of their assets, enterprises enjoying depreciations of their debt. These depreciations were at times as high as five per cent of GDP. Their level depends upon the rate of inflation and the level of assets. For households, the annual "loss" used to lie between 1 and 1 1/2% in the 'sixties; it shot up in the 'seventies to reach 5% in 1973; after decreasing until 1978, it rose again strongly in 1979, 1980 and 1981.

The "gains" of the enterprise sector show a similar trend, with the main difference emerging since the middle of the 'seventies : from this point of time onwards, enterprises "win" less than households "lose" as the government turns from a net creditor to a net debtor and so starts to benefit from the depreciation of its net liabilities (1,0% of GDP in 1981). The rest of the world as a net debtor has always enjoyed depreciation of its debt, ranging from 0,1% to 0,4% of GDP.

These figures rest upon the sector definitions in the German national accounts. As mentioned earlier, a substantial part of transactions reported in the enterprise sector as a whole are actually carried out by private households to finance the acquisition of dwellings. Excluding the sub-sector housing from the enterprise sector suggests that the 'gains' of the enterprises in the narrower sense are about half as large as the gross figures, exceeding 2% of GDP only in the high-inflation period 1972-1974 and again in 1981. On the other hand, the 'losses' of the gross household sector are in fact partly compensated for by the 'gains' of households from outstanding debt related to housing, but the data are not sufficient to indicate the magnitude of this effect.

(13) Disregarding enterprises without housing.

(14) Monetary gold has been excluded from the assets of the financial sector and the liabilities of the rest of the world.

V. ADJUSTMENT OF SIGNIFICANT MONETARY RATIOS

Households

A phenomenon common to many countries is the rise of the savings ratio of private households in the 'seventies. As Table 15 (left-hand column) suggests, Germany is no exception to this trend. The traditionally measured savings rate correlates rather closely with the inflation rate, rising in the late 'sixties and in the first half of the 'seventies, declining afterwards when inflation slowed down and rising again after 1979 with accelerating price rises.

Inflation accounting has a direct and significant effect upon the savings ratio. As conventional saving is defined as income not spent, any correction to income applies to saving as well. Thus the depreciation of household assets shown in Table 14 (expressed in DM, see annex Table) has been deducted from both savings and from disposable income to establish an adjusted savings ratio which is apt to give a more accurate picture of saving trends than the traditional one.

The adjusted savings rate (s^*) has been calculated as :

$$s^* = \frac{S - L}{Y - L}$$

where S is saving of households, L the 'loss' on net financial claims due to inflation and Y disposable income of households, all in the same year.

Over the whole period, there is no increasing or decreasing trend of the adjusted savings ratio discernible (column 2 of Table 15 and Graph 1). Thus it may indeed be argued that the rise of the traditionally measured savings ratio does not reflect a changed behaviour of private households, but is due to a measurement error, as national accounts fail to take account of the effects of inflation on the value of real assets.

The difference in level between the unadjusted and the adjusted savings ratio has become important in recent years : in 1981 the two rates are 13,6% and 5,7 % respectively. This means that about 8% (i.e. the difference between the rates) of disposable income of households was necessary to reconstitute the initial real value of net assets.

Table 15
Adjustment of significant ratios

	HOUSEHOLDS				ENTERPRISES			
	Savings in % of disposable income		Gross savings in % of gross investment of all enterprises		Gross savings in % of gross investment of enterprises without housing			
	before adjustment	after adjustment	before adjustment	after adjustment	before adjustment	after adjustment	before adjustment	after adjustment
1960	8,6	8,0	67,3	67,4	87,9	89,3		
1961	9,1	7,3	61,0	67,3	79,3	83,7		
1962	8,6	6,4	61,6	69,5	80,1	85,8		
1963	9,9	7,7	62,0	70,5	82,0	88,2		
1964	11,3	10,0	61,1	66,0	81,0	84,5		
1965	12,2	9,5	58,9	68,7	76,2	83,2		
1966	11,6	9,5	63,3	71,2	85,4	91,4		
1967	11,2	10,6	74,9	77,1	108,1	109,9		
1968	12,5	10,8	70,2	76,9	94,2	99,0		
1969	13,3	11,5	56,7	62,6	69,8	73,9		
1970	13,8	10,4	56,9	67,8	69,3	77,3		
1971	13,5	8,5	56,3	72,5	71,5	84,4		
1972	14,4	8,7	54,5	73,5	72,2	88,4		
1973	13,9	6,4	52,5	76,6	68,2	88,3		
1974	14,6	8,8	61,5	83,6	79,6	98,3		
1975	15,1	9,7	68,3	91,8	87,7	107,7		
1976	13,3	9,4	65,4	79,1	80,5	91,3		
1977	12,1	8,3	62,3	75,3	75,4	85,4		
1978	12,1	9,2	69,2	78,5	85,2	92,0		
1979	12,6	6,4	60,9	78,0	71,6	83,4		
1980	12,8	6,2	56,3	74,7	65,9	79,3		
1981	13,6	5,7	58,9	82,8	68,5	90,2		

Source : own calculations

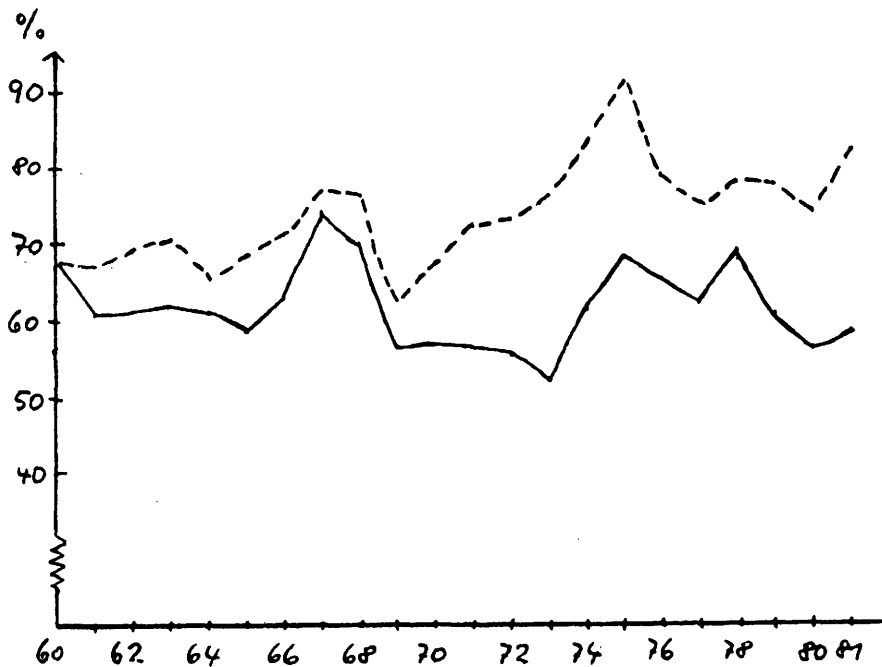
Graph 1

Savings of household in % of disposable income



Graph 2

Gross saving of enterprises in % of gross investment



Enterprises

Given the large indebtedness of the enterprise sector the usual ratios to measure the financial position of enterprises may also be expected to show a different trend if adjusted for 'gains' from inflation. Here again it should be stressed that the figures presented do not tell anything on income redistribution via inflation, since the question whether inflation was anticipated or not and to what extent the enterprise sector has compensated the creditors for inflation losses through higher payments of nominal interest rates is excluded from the analysis.

The indicator presented here is the ratio between gross savings (depreciation allowances plus retained profits) and gross investment (gross fixed investment plus stockbuilding), which shows to which degree investment is financed by own resources of the enterprise sector (15). Gross savings (S) in per cent of gross investment (I) in unadjusted terms reveal no clear trend over time, fluctuating between 53% and 75% for the total enterprise sector (columns 3 and 4 of Table 15 and Graph 2). The adjusted ratio, however which is defined as $\frac{S+G}{I}$, (where G is the 'gain' on net liabilities due to inflation) was in the 'seventies on average noticeably higher than in the 'sixties, attaining 83% in 1981. The share of the investment financed by own resources rose markedly in the three recession periods of 1966/67, 1974/75 and 1981, which is a reflection of the low level of investment in these years. The corresponding ratio for the enterprises without housing, while on a higher level, shows similar fluctuations (columns 5 and 6 of Table 15).

Balance on current account

Subtracting the inflation-induced 'loss' of the domestic sectors from the German current account surplus (adding it in case of a deficit) gives the adjusted balance on current account (columns 1 and 2 of Table 15) (16). Given the relatively low net assets of the nation (monetary gold is excluded), the size of the correction is rather small in the German case, but may be more important for other countries.

(15) Net capital transfers received from other sectors are not regarded here as a part of the own resources of the enterprise sector.

(16) Exchange rate movements have not been taken into account; in recent years about three quarters of German liabilities to the rest of the world were denominated in DM, and about one half of the claims.

Government

The first ratio adjusted is net lending or net borrowing of general government in per cent of GDP (columns 3 and 4 of Table 16 and Graph 3) where the adjusted series is obtained from $\frac{L+G}{GDP}$, where L is net lending and G the 'gain' (negative if there is a 'loss'). Comparing the two series we find that the position of the government was less favourable after adjustment from 1960 up to 1975 (the adjusted deficits higher), which follows from the government's net creditor position at this period. From 1976 onwards, the adjusted deficit was lower with the gap between the two series tending to increase from year to year, amounting to 0,9% of GDP in 1981 (unadjusted government deficit 4,0% of GDP, inflation-adjusted deficit 3,1%).

Again, these figures need to be interpreted cautiously. They reflect the simple fact that with inflation and given the net debtor position of the government sector in recent years the value at constant prices of the debt depreciates year by year (apart from issuing new debt). Whether there is a redistribution of incomes from the private to the public sector depends on the degree to which inflation was anticipated and whether inflation premiums were incorporated in the interest rates the government had to pay.

The extent of the downward adjustment of the deficit in recent years is appreciable and the question arises whether this has implications for the assessment of budgetary policy.

Firstly, the lower deficit resulting from inflation accounting does not relieve present constraints for deficit financing; only future expenditure in real terms as implied in public debt is reduced.

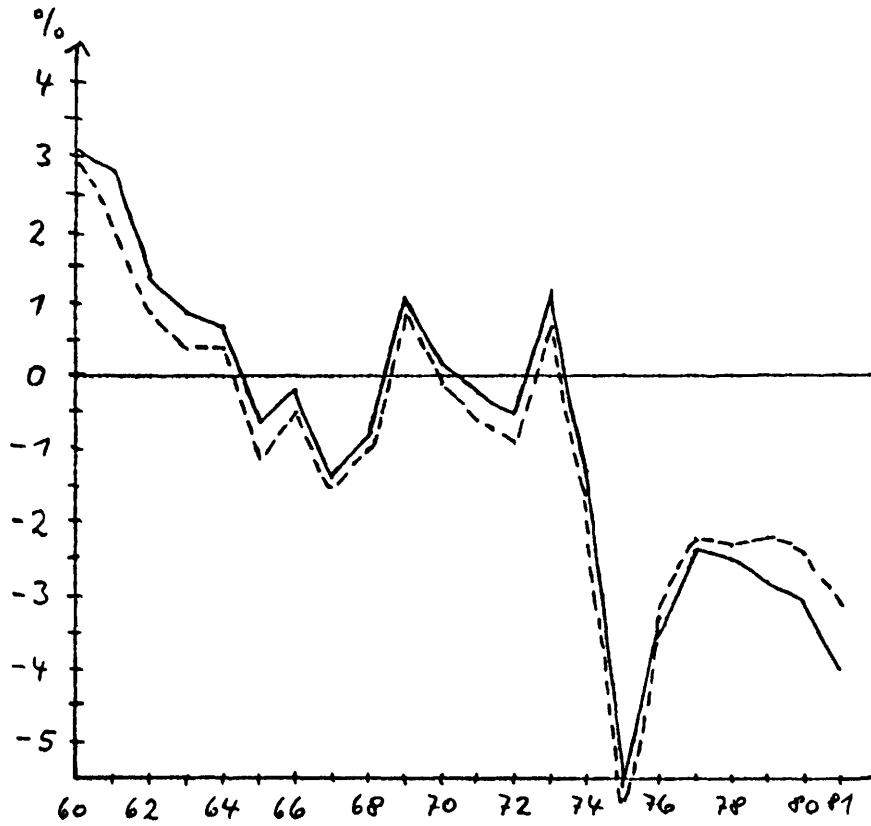
Table 16
Adjustment of significant ratios

	ALL DOMESTIC SECTORS				GENERAL GOVERNMENT			
	Balance on current account in bn DM		Net lending or borrowing (-) in % of GDP		Interest paid in % of GDP			
	before adjustment	after adjustment	before adjustment	after adjustment	before adjustment	after adjustment	before adjustment	after adjustment
1960	4,8	4,7	3,0	2,9	0,7	0,9	0,7	0,9
1961	3,2	2,7	2,8	2,4	0,7	1,1	0,7	1,1
1962	-1,6	-2,2	1,4	0,9	0,7	1,2	0,7	1,2
1963	0,9	0,4	0,9	0,4	0,7	1,2	0,7	1,2
1964	0,5	0,2	0,7	0,4	0,7	1,0	0,7	1,0
1965	-6,2	-6,7	-0,6	-1,1	0,7	1,2	0,7	1,2
1966	0,5	0,2	-0,2	-0,5	0,8	1,2	0,8	1,2
1967	10,0	9,9	-1,4	-1,5	1,1	1,1	1,1	1,1
1968	11,9	11,3	-0,8	-1,0	1,0	1,2	1,0	1,2
1969	7,5	6,8	1,1	0,9	1,0	1,1	1,0	1,1
1970	3,2	1,8	0,2	-0,1	1,0	1,3	1,0	1,3
1971	2,8	0,9	-0,2	-0,6	1,0	1,4	1,0	1,4
1972	2,7	0,6	-0,5	-0,9	1,0	1,4	1,0	1,4
1973	12,4	9,3	1,2	0,7	1,1	1,6	1,1	1,6
1974	26,6	23,5	-1,3	-1,6	1,2	1,6	1,2	1,6
1975	9,9	6,2	-5,7	-5,8	1,4	1,5	1,4	1,5
1976	9,9	7,1	-3,5	-3,3	1,6	1,4	1,6	1,4
1977	9,5	6,7	-2,4	-2,2	1,7	1,5	1,7	1,5
1978	18,1	15,9	-2,5	-2,3	1,7	1,5	1,7	1,5
1979	-11,0	-15,3	-2,8	-2,2	1,7	1,2	1,7	1,2
1980	-29,5	-32,4	-3,1	-2,4	1,9	1,3	1,9	1,3
1981	-17,3	-19,0	-4,0	-3,1	2,3	1,3	2,3	1,3

Source : own calculations

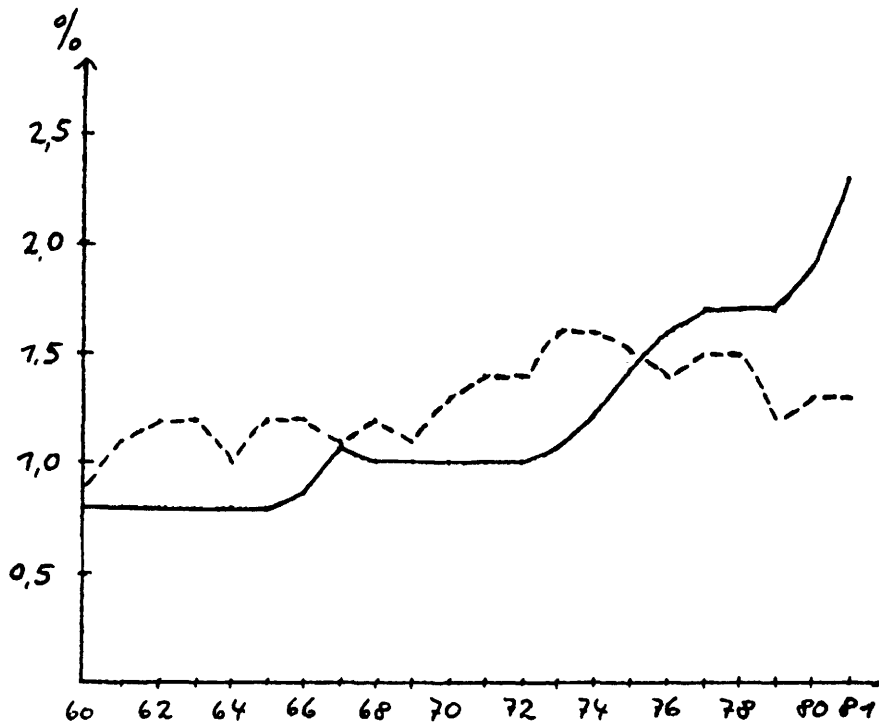
Graph 3

General government net lending or borrowing (-) in % of GDP



Graph 4

Interest paid by the government in % of GDP



Secondly, as far as inflation is anticipated, inflation accounting even underlines the fact that budget financing - as indeed borrowing in general - is more difficult with than without inflation. If an inflation premium is included in nominal interest rates each interest instalment in the early years of the maturity not only implies the payment of interest but some repayment of principal. The real value of the debt declines with inflation, but this means also less real resources at the disposal of the government, and this creates a financial strain.

It may be interesting to see how these interest payments - whether containing an inflation premium or not - developed when adjusted for the 'gains' of the government sector. Interest payments of the government sector (IP) have been corrected by the inflation-induced depreciation of its gross liabilities (G'), and the results expressed as a percentage of GDP : $\frac{IP - G'}{GDP}$. The unadjusted figures show an upward trend, rising to 2,3% in 1981, whilst there is no such trend discernible if interest payments are adjusted (columns 5 and 6 of Table 16 and Graph 4). As with the adjusted deficit of general government, the adjusted interest payments are lower than the unadjusted ones only from 1976 onwards, when the government turned into a net debtor position. In 1981, however, the interest charge was only a little more than 50% of the gross figures, if the inflation 'gain' is deducted (1,3% of GDP and 2,3% respectively).

So far the accounts of the Deutsche Bundesbank were included in the sector of financial institutions. It may be argued that because its influence on financial conditions in the economy is overwhelming and dominated by public interests, and since it is acting as an economic policy body, its accounts should be excluded from the financial sector and included in the government sector. An argument related to recent developments for such a redefinition of sectors is the fact that Bundesbank profits have recently become an important source of financing for the federal budget deficit. Furthermore, for the sake of harmonisation of the study on Germany with studies on other countries, where the central bank is more closely linked to the government, an extension of the analysis based on this new sector definition seems useful. It allows a closer look at budget financing under conditions of inflation.

The results of various adjustments to the budget deficit are shown in Table 17. The unadjusted deficit of general government plus central bank (line 1) differs from the unadjusted deficit of general government alone (as in Table 16) by the net change of financial assets and liabilities of the central bank. As this change is usually positive (the central bank enjoys a 'surplus'), the deficit presented in Table 17 is smaller (by almost 0,5% of GDP in recent years) from the deficit of the government alone, as shown in Table 16. The size of the adjustment is also different since the net assets are different now. The overall effect of the wider definition of the government sector is to increase its net liabilities, hence its 'gain' from inflation is larger than without the inclusion of the central bank. However this supplementary 'gain' is rather small, varying from 0% to 0,4% of GDP in the period from 1971 to 1981.

Most of the Bundesbank's liabilities are non-interest-bearing and may be set equal to high-powered money. Deducting these liabilities from net total assets of government plus central bank leaves net interest-bearing assets of the enlarged government sector. Correcting the unadjusted deficit of line 1 by 'losses' or 'gains' on this amount of net assets may be a better indicator of the potentially inflationary effect of the budget than net assets including high-powered money. The difference against the unadjusted deficit is relatively small (line 3 of Table 17) : In the first half of the 'seventies the adjusted one points to a higher deficit, in the middle of the decade both were very similar, and only from 1979 onwards the adjusted deficit was lower (3,1% of GDP in 1981 against 3,5%).

With the definition of the government sector here, the increase of the amount of high-powered money from one year to the next is a source of government finance. Subtracting this increase from the adjusted deficit of line 3 of Table 17 we get a measure of the extent to which the government has to call upon savings in order to finance its deficit. This definition of the deficit may be appropriate in analysing crowding out problems. As the results show (line 4 of Table 17), the extent of the adjustment against the unadjusted series of line 1 is quite important for some years, and its

Table 17

Budget balance of general government plus Central Bank according to different concepts, 1971-1981

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
	% of GDP										
Net lending or borrowing (-):											
1. Unadjusted	0,1	-0,2	1,6	-0,8	-5,4	-3,1	-2,1	-2,1	-2,3	-2,6	-3,5
2. Adjusted for inflation induced depreciation of net monetary assets	-0,1	-0,4	1,5	-0,8	-5,2	-2,8	-1,8	-1,8	-1,5	-1,9	-2,6
3. Adjusted for inflation induced depreciation of net interest bearing assets	-0,6	-1,0	0,8	-1,4	-5,7	-3,1	-2,1	-2,0	-2,0	-2,4	-3,1
4. As 3., less change in high-powered money	0,4	2,1	1,3	-1,4	-5,8	-1,9	-1,3	-0,9	-1,6	-2,7	-3,3
Memo items :											
5. Depreciation of net monetary assets	0,2	0,1	0,1	0,0	-0,2	-0,3	-0,3	-0,3	-0,7	-0,8	-0,9
of which - interest bearing	0,7	0,7	0,8	0,6	0,3	0,1	0,0	-0,1	-0,2	-0,3	-0,4
6. Change in outstanding high-powered money	1,0	3,0	0,5	-0,1	-0,1	1,3	0,8	1,2	0,4	-0,3	-0,1

Source : own calculations

direction may change quickly. Generally, in years with fast growth of the money supply (1971/72, 1976/78) this crowding-out-orientated definition of the deficit tends to show a lower deficit than that of line 1. By contrast, it indicates to a higher than the unadjusted deficit in periods of restrictive monetary policy (1974/75, 1980). In the latter year it approaches the unadjusted deficit despite unusually high 'gains' from inflation.

Table 18
Depreciation of net monetary claims (-) and liabilities, 1960-1981

	billion DM					
	Households	Enterprises total	Enterprises without housing	Financial Institutions	Government	Rest of the World
1960	- 1,2	1,5	0,7	0,0	- 0,4	0,9
1961	- 4,0	4,8	2,4	0,2	- 1,4	0,5
1962	- 5,3	6,5	3,2	0,2	- 2,0	0,6
1963	- 5,6	6,9	3,4	0,2	- 2,0	0,5
1964	- 3,8	4,6	2,2	0,1	- 1,2	0,3
1965	- 8,9	10,6	5,2	0,2	- 2,4	0,5
1966	- 7,3	8,5	4,2	0,1	- 1,7	0,3
1967	- 1,8	2,1	1,0	0,0	- 0,3	0,1
1968	- 6,8	7,2	3,4	0,1	- 1,0	0,6
1969	- 7,5	7,8	3,8	0,0	- 1,0	0,7
1970	-16,2	17,1	8,6	-0,1	- 2,2	1,4
1971	-25,8	27,1	14,0	-0,2	- 3,1	1,9
1972	-33,2	34,5	17,8	-0,3	- 3,2	2,1
1973	-46,2	47,9	24,3	-0,5	- 4,3	3,1
1974	-39,2	39,7	20,1	-0,4	- 3,2	3,1
1975	-41,0	38,9	19,7	-0,7	- 0,9	3,7
1976	-31,3	27,7	13,9	-0,5	1,2	2,8
1977	-32,8	27,7	13,6	-0,2	2,5	2,8
1978	-26,2	21,4	10,2	-0,1	2,7	2,2
1979	-59,9	49,0	22,4	-0,8	7,4	4,3
1980	-68,1	57,2	25,9	-2,1	10,1	2,9
1981	-85,1	72,1	32,8	-4,0	15,3	1,7

Source : see Table 2

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