Fiscal Expansion, the Budget Deficit and the Economy: Norway 1988-91

by

Einar Bowitz, Asbjørn Rødseth and Erik Storm

Fiscal Expansion, the Budget Deficit and the Economy: Norway 1988-91

by

Einar Bowitz[1], Asbjørn Rødseth[2] and Erik Storm[1]

Abstract

From 1989 fiscal policy in Norway has been expansionary. With the aid of the econometric model MODAG we estimate the size of the change in policy from 1988 to 1991, its final effect on the central government budget, and its effect on the economy. We also assess the effects on the budget of cyclical factors and structural change. These appear to be more important for the increase in the deficit than activist policy. The budgetary costs of the extra jobs created by the activist part of the policy seem high.

Keywords: Fiscal policy, budget indicators, macroeconomic model

1) Statistics Norway, Research Department
2) University of Oslo, Department of Economics

1. Introduction

After Norway had gone into a steep recession in 1988, fiscal policy turned expansionary in the summer of 1989. The structural budget deficit (the deficit adjusted for cyclical effects and oil revenues) as calculated by the Ministry of Finance was increased by 5.6 per cent of GDP from 1988 to 1991. The Ministry has used this change as a measure of the demand stimulus from the central government budget. In this paper we use the MODAG-model of Statistics Norway to estimate the effect of the policy change on key macroeconomic variables and on the budget deficit.

There are several reasons for doing this study. One is that the methods used to decompose the deficit into structural and cyclical components disregard important automatic stabilizers which are included in MODAG. Most important of these are the links between unemployment, early retirement, disability pensions and some other forms of income support.

An equally important reason is that even if we managed to account for all automatic stabilizers, the change in the structural deficit would not be solely due to changes in policy. Structural deficits may change just because the structure of the economy changes in ways that are not controlled by the government. In order to judge government policy and to inform people properly about what is going on in the economy, it will be useful to distinguish those changes in the budget which are due to active use of policy instruments from those that are due to exogenous developments, or are delayed results of past events.

Furthermore, changes in policy instruments do have an impact also on the cyclical part of the deficit. An expansionary policy increases actual relative to trend GDP. The policy's overall effect on the budget deficit is thus composed of an increase in the structural deficit and a reduction in the cyclical deficit. Disregarding the cyclical deficit, means overstating the effect of the policy change on the overall deficit.

Buiter (1989) argued strongly against using the structural deficit as an indicator of fiscal stance, and in favour of using a complete model specifying the policy parameters available. In this way one could account for different macroeconomic effects depending on the particular composition of the policy. He countered the argument that the results obtained will be model dependent by pointing out that when one uses structural deficits, one also relies on a model. The way structural deficits are normally calculated, this implicit model is too simple to put much credence on. This is also our opinion.

If one believes that GDP has a strong tendency to return to the reference level used in the calculations of the structural deficit, the structural deficit may still serve as a first indicator of sustainability. Blanchard et al. (1990), however, argue that one should use more forward looking indicators or simulations of the future development of government debt. The use of the structural deficit as an indicator of sustainability is outside the scope of the present paper.

The paper proceeds as follows: In section 2 we present some facts about central government finances in Norway. In section 3 we outline the basic features of the MODAG model. In section 4 we discuss what is to be meant by an unchanged policy. In section 5 we give the results of the simulations and compare them to the estimates of structural and cyclical deficits produced by the government. Section 6 then concludes.

2. Central government finances 1988-1991

After a period of high capacity utilisation in the mid-80's an unprecedented downturn in economic activity in Norway started in 1987. Unemployment rose from 2.1 per cent of the labour force in 1987 to 5.5 per cent in 1991. GDP of Mainland Norway (i.e. excluding the off-shore oil industry and ocean transport) was lower in 1991 than in 1987. Fiscal policy, which had been contractionary since the fall of oil prices in 1986, turned expansionary in 1989. While the surplus (net lending) of the central government was 22.9 billion NOK (3.4 per cent of GDP) in 1988, this turned into a deficit of 2.9 billion NOK (0.4 per cent of GDP) in 1991. Table 1 describes the changes in government finances in some detail.

During 1988-91 petroleum revenues grew rapidly because new oil and gas fields were opened for production and world market prices increased. If we exclude net petroleum-related revenues, the fiscal turnaround becomes more visible; the decline in the central government surplus from 1988 to 1991 was 55.9 bill NOK, or 9.9 percentage points of Mainland GDP. Tax revenues (other than from the off-shore petroleum industry) showed a real decline of 4 per cent. This was caused both by the decline in economic activity and by reductions in tax rates to counter the recession. Most expenditure categories increased sharply; total expenditure in our classification increased by more than 19 per cent. Transfers to the private sector increased in line with this aggregate, while transfers to local government increased even more, especially in 1991.

Table 1.

Central government[1] revenues and expenditures 1988-1991. Billion NOK in 1991-prices[2]

	1988	1991	Change
REVENUES			
Net financial revenues [3]	22.7	24.9	2.2
Petroleum related revenues (net)	12.5	42.6	30.1
Direct taxes	124.0	122.0	-2.0
Indirect taxes	112.2	104.5	-7.7
Total revenue	271.4	294.0	22.6
EXPENDITURES			
Transfers to households	105.4	127.7	22.3
Net transfers to local govt.	44.1	54.4	10.3
Other transfers	40.6	45.8	5.2
Public consumption	52.4	60.4	8.0
Net investment [4]	6.0	8.6	2.6
Total expenditure	248.5	296.9	48.4
Surplus (Net lending)	22.9	-2.9	-25.8
Excluding petroleum revenues	10.4	-45.5	55.9

1) All figures are from the National Accounts as they were available in January 1992. They may deviate from figures which have been published more recently, and also from the government's Fiscal Accounts, which exclude several government funds and use different principles of periodization.
2) All figures are deflated by the consumer price index.
3) Includes transfers from the Norwegian Central Bank.
4) Includes net purchases of real estate.

Among transfers to private households, retirement pensions was the single category contributing most to the overall increase. This was due to an increase in the number of persons entitled, and, more importantly, to increased pension payments per person. New cohorts of old age pensioners were entitled to larger pensions than their predecessors. There was also a sharp increase in unemployment benefits and transfers related to disability and long-term illness. Further contributions came from discretionary increases in family allowances and other welfare state benefits.

The change in fiscal policy shows up also in the indicators of fiscal stance calculated by the Ministry of Finance and by the OECD. As mentioned in the introduction, the "cyclically

adjusted deficit" calculated by the Ministry increased by 5.6 per cent of the trend GDP of Mainland Norway from 1988 to 1991. The adjustments made to the overall defict are: 1)Revenues and expenditures related to off-shore activities are excluded. 2)Tax revenues are normalized by adjusting non-oil GDP, employment, relative prices of some exports and sales of new cars to reference levels. 3)Unemployment benefits are normalized to a reference level of unemployment. 4)Some interest payments between the government and the central bank, and between the government and foreigners are excluded.

OECD's indicators of fiscal stance showed a smaller expansion. The cyclically adjusted primary defict increased by 3.8 per cent of trend GDP. One reason for the discrepancy is that OECD looks at general government, while the Ministry looks at central government only. Local governments reduced their deficits.

3. Behavioural assumptions in MODAG

MODAG is a large (some 30 sectors and 40 commodities) macroeconometric model of the Norwegian economy, see Cappelen (1992) for a description. The mechanisms of the model are similar to those found in many macroeconometric models in other European countries. Positive demand shocks induce increases in production and employment in the short to medium term due to traditional Keynesian multiplier and accelerator effects. At low levels of unemployment, however, increased pressure in the labour market causes significant wage increases via reduced competitiveness in foreign and domestic goods markets, and via substitution between labour, intermediate inputs and capital. These effects offset the demand effects in the longer run. The supply-side effects, which dominate long-run results, are of little importance within the three year horizon of this paper.

Expenditures and revenues are specified on a large number of categories for both the central and local government. A feature of MODAG that may not be very common in macroeconometric models, is that the bulk of transfers private consumers is endogenous. There is a fairly detailed specification of the demographic structure, e.g. the number of persons 67 and above is important in determining retirement pensions, the number of births in determining confinement benefits etc. All public pensions are indexed to average hourly wages. The higher pension entitlements of new cohorts are taken account of.

Estimated equations connect transfers to the level of unemployment. There are significant

effects from the labour market not just on unemployment benefits, but also on disability benefits, sickness allowances (long term sickness), rehabilitation benefits and supplementary benefits. As unemployment benefit can be received continuously for just 2 years, long term unemployed often become recipients of rehabilitation benefits, and then finally of disability benefits.

According to the model, an increase in unemployment causes an increase in these other labour market related transfers of about the same size as the increase in unemployment benefits after five years, see Bowitz (1992). This is fairly consistent with the model's description of the discouraged worker effect in labour supply; a decline in employment is split half and half between increased unemployment and reduced labour force participation. An interpretation of the model is thus that the discouraged workers appear in the transfer model as recipients of different types of benefits.

Also the revenues from direct and indirect taxes are calculated in great detail, utilising the disaggregation of the model. Some 90 per cent of central government revenue is endogenous. On the other hand, government consumption and investment in constant prices are exogenous.

In the introduction we referred to important automatic stabilizers included in MODAG but not in the Ministry of Finance's calculations of the cyclic component of the deficit. Most important among these are the relations between unemployment and transfers other than unemployment benefits. Another advantage of using MODAG is the more detailed representation of taxes. For the Norwegian central government taxes on consumption (VAT, taxes on cars, petrol, alcohol, tobacco etc.) are as important as income taxes (see Table 1). On the other hand, there are no indirect taxes on exports. In the period 1988-91 the Norwegian current account swung from a deficit of 4.3 per cent of GDP to a surplus of 5.1 per cent. The consumption of heavily taxed goods like alcohol and new cars also seem to be more cyclical than aggregate consumption. In these circumstances cyclical corrections which relate tax revenue to GDP only, and not to each expenditure component, are bound to understate the effect on tax revenue of the downturn in the economy. The Ministry of Finance has recognized this by normalizing not only GDP, but also sales of new cars when they calculate the structural deficit. Using MODAG takes this disaggregate approach several steps further.

4. Defining policy change

When the change in the structural deficit is used as a measure of the change in policy, the implicit definition of an unchanged policy is a policy which keeps the structural deficit constant; i.e. a policy which keeps the deficit calculated at the reference level of GDP constant. This definition has the awkward property that an "unchanged policy" is a policy which responds to external forces which raise the structural deficit, by discretionary expenditure cuts or tax increases. Thus, when structural changes in the economy (e.g. ageing of the population) lead to increased deficits, we may be lead to say that fiscal policy has been loosened even if every single taxpayer as well as every single recipient of government money or services experience a tightening. If one wants a constructive public discussion about fiscal policy, one should avoid defining words in ways that are only bound to create confusion (and perhaps disbelief).

It should also be pointed out that when unchanged policy is defined as an unchanged structural deficit, the exact meaning of this definition depends on which model we choose for cyclical adjustment, and on the particular choice of exogenous variables and error terms that we imagine bring GDP to its reference level. Tax revenues at full employment will be quite different depending on whether we imagine that full employment is achieved by an increased propensity to consume or by lower wages.

We prefer to work from the common sense definition of unchanged policy which says that policy is unchanged as long as the laws and rules governing taxes and expenditures are unchanged. In cases where there are no laws and regulations determining expenditure, we interpret "unchanged policy" to mean a certain real growth rate. This is also the approach taken in Artis et al (1984). In practice we write down a reference path for all exogenous policy parameters in the model. Policy changes are defined relative to this reference path.

An alternative approach would be to estimate reaction functions for important policy variables and analyze whether these have changed. This is done in Wallis and Whitley (1992) for the UK. Their approach may provide an interesting interpretation of history, but seems less helpful in providing information that may be of use when formulating policies.

Naturally there is much arbitrariness in the selection of the reference path. Our defence is that there is much arbitrariness also in the definition based on structural deficits, and that with our approach it is fairly transparent which alternative the present policy is compared to.

Our reference path for central government (non-military) consumption and investment (which are exogenous in MODAG) make them grow at a rate equal to the average growth rate of GDP (exclusive of the petroleum sector and ocean transport) during 1980-1990[1]. This growth rate was 2 per cent per year, and applies to all categories of goods and services except government employment. The yearly growth rate for the latter along the reference path is set to 1.5 per cent, because the Norwegian National Accounts impute a productivity growth of 0.5 per cent per year to labour in the public sector. The use of the historical trend growth of GDP as a reference point, is in line with the practice of using trend GDP as a reference for computing structural deficits. The reference path implies a break with past history, since over the period 1980-88 the share of central government demand in aggregate demand increased somewhat.

One alternative was to keep each consumption and investment item constant. Another was to prolong the historical growth rates of each item of expenditure. We rejected both. The first seems unreasonable when population is growing. The second is difficult to communicate, especially when policies were changing during the reference period. Furthermore, by prolonging trends one could soon get an unreasonable composition of government expenditure.

The reference path has constant tax rates. For the personal income tax this means a constant average tax rate for the sector as whole. Indirect taxes collected on a volume basis were indexed to consumer prices.

Norwegian law states that transfers from the National Insurance should be indexed to average labour income. The parliament may deviate from this by discretion. Thus we define the reference policy by indexing transfers from National Insurance to wages. Lately, a number of legislative changes have been made to contain the growth in transfers. Most of these policy measures are aimed at the long term growth in expenditure and their effects in 1988-91 were small. Some transfers were increased substantially in the period 1988-1991 (notably family allowances). Changes in these above what follows from indexation are counted as discretionary policy.

"Other transfers" (i.e. neither to households nor to local government) include foreign aid, commodity subsidies and industry subsidies; the latter being the major item. It has been a stated policy that foreign aid should equal a certain share of national income. In the reference path we indexed commodity subsidies to the price level the same way we did with commodity taxes. In MODAG industry subsidies are exogenous lump sums. We treated them like government consumption, i.e. gave them a 2 per cent annual real growth. Some of the

subsidies are indeed not much different from government purchases; e.g. subsidies to private research institutes, schools or cultural institutions. Other subsidies have a different purpose, but the structure of MODAG made a differentiated treatment difficult[2].

The large transfers from central to local government present a particular problem, especially since MODAG has no equations to describe how local governments respond to them. Part of the expansionary fiscal policy has been to increase the transfers to local government to promote local government consumption of health services, education etc. Local government is also affected by changes in the tax base, and covers some of the costs of caring for the unemployed. The local income tax rate is in effect determined by the central government. Since local government has the main responsibility for health care, care for the elderly, child care and education, a sharp reduction in local tax income is bound to lead to some compensation from the central government.

However, local governments are free to choose between spending and lending[3]. From 1988 to 1991 there was a sharp reduction in local government borrowing, while spending on goods and services grew at a slower pace than in the preceding period. We treat this as an endogenous development, not as a part of the central government's policy.

We chose to define the reference policy for transfers from central to local government as the level of transfers which would have made the yearly real growth in local government revenue from taxes and transfers equal to 2 per cent. The actual growth in transfers was somewhat higher than this, and the difference is regarded as a change in policy. Implicitly we then assume that the reference policy is to compensate local government fully for changes in tax revenue caused by the business cycle, as well as for changes in tax rates enacted at the central level. Furthermore, we assume that local government spent each krone received from the central government in excess of the reference path one for one on consumption and investment[4]. Thus local government net borrowing is the same along the reference path as along the actual.

Government owned non-incorporated businesses pose another problem. Their investment plans are subject to approval from parliament. In the fiscal accounts lending to these firms is treated at par with investment expenditure. On the other hand, government owned firms have recently been given more independence, and they have been asked to behave more like private businesses. We chose to treat them as a regular part of the business sector, which implies that lending to government owned firms is not considered a part of fiscal policy. (Of course subsidies to the same firms count as fiscal policy). Since net lending to government owned firms was substantially reduced from 1988 to 1991, including such lending would have

reduced our measure of how expansionary the policy was. In fact Eika (1993) points to reduced government controlled investment in the oil and electricity industries as one major reason for the downturn in the Norwegian economy.

It is important to note that our reference path need not be sustainable. Growth in structural components might force the politicians to reduce expenditures or increase taxes to avoid a steadily increasing ratio of debt to GDP. If the reference path is not sustainable, that counts as one reason for changing policy. It is not an argument for measuring policy changes in a different way.

5. Results

The results are summarized in Tables 2 and 3. We shall first describe the policy change, then go on to its effect on the economy and on the government's budget, before we wind up with a discussion of other factors that have influenced the budget balance.

5.1 The policy change

The first column of Table 2 shows the actual changes in the central government's budget from 1988 to 1991. These figures were commented upon in section 2. The second column shows the "first round" or impact effect on the 1991 budget of the policy change from 1988 to 1991. These figures tell us the contribution from the change in policy to the change in the deficit under the assumption that the policies had no effect on the tax base or on the number of recipients of transfers etc.

The total value of the expansionary policy change in the 1991 budget was 26.2 billion NOK or 4.9 per cent of GDP for Mainland Norway. The largest change in policy was an increase in transfers to local government equal to 8.1 billion kroner. Of this 5.6 billion kroner were needed mainly to compensate local government for reductions in local income taxes that were enacted at the central level. (These took the form of a rapid increase in the tax-free allowance while the tax rate was constant). The remaining 2.5 billion kroner was the amount needed to raise local government revenue above the reference path; from a reference yearly growth rate of 2 per cent to the actual growth rate of 2.2 per cent. This extra money by assumption went into local government consumption and investment.

Table 2.

Central government revenues and expenditures. Change from 1988 to 1991.

Billion NOK in 1991 prices[1]

	Actual change 1	Policy Impact 2	Policy Final 3	Demogr. change 4	Trend growth 5	Residual factors 6=1-3-4-5
REVENUES						
Net financial revenue[2]	2.2	0.0	-2.7	-0.6	1.4	4.1
Petroleum revenue(net)	30.1	0.0	0.0	0.0	0.8	29.3
Direct taxes	-2.0	-5.2	-4.1	0.8	7.6	-6.3
Indirect taxes	-7.7	2.5	3.3	0.6	6.9	-18.5
Total revenue	22.6	-2.7	-3.5	0.8	16.7	8.6
EXPENDITURES						
Transfers to households	22.3	5.8	3.1	4.2	6.5	8.5
Net transf. to loc.govt.	10.3	8.1	3.9	-0.7	2.7	4.4
Other transfers	5.2	3.7	3.7	0.0	2.5	-1.0
Consumption	8.0	2.9	1.8	0.0	3.2	3.0
Net investment[3]	2.6	3.0	2.8	0.0	0.4	-0.6
Total expenditure	48.4	23.5	15.3	3.5	15.3	14.3
Surplus (net lending)	-25.8	-26.2	-18.8	-2.7	1.4	-5.7

1) All figures are deflated by the consumer price index.
2) Includes transfers from the Norwegian Central Bank.
3) Includes net purchases of real estate.

Other major changes in policy were an increase in central government consumption and investment expenditure of 5.9 billion kroner, and an increase in transfers to households of 5.8 billion kroner. Other transfers, i.e. subsidies, increased by 3.7 billion kroner.[5]

There was a change from direct to indirect taxes. The net tax reduction at the central level was only 2.7 billion kroner. However, when we also take account of the reduction in local taxes, the net tax reduction was 8.3 billion kroner. Increased consumption and investment accounted for almost the same amount (8.4 billion kroner) when we consider both levels of government together.

The increase in central government consumption relative to the reference path was entirely due to increased purchases of goods and services from the private sector, not to increased employment. Central government employment increased by just 1.6 per cent per year, while purchases of goods and services from the business sector increased by 7.1 per cent per year. In the local government sector the growth in employment and in purchases of goods and services were more balanced.

5.2 Effects of the expansionary fiscal policy on the economy

Table 3.

Effect of policy change from 1988 to 1991 on key macroeconomic variables in 1991. Per cent

	Effect of policy	For reference: Total change in levels from 1988 to 1991
Gross domestic product	2.4	5.7
Mainland GDP	2.9	-0.3
Domestic use of goods and services	3.7	-3.2
Private consumption	2.2	-0.3
Government consumption	3.2	8.5
Central government	4.1	15.4
Local government	2.5	4.2
Gross capital formation[1]	8.6	-14.5
Public sector	15.2	10.4
Private sector	7.0	-18.8
Consumer prices	-0.3	12.8
Hourly wages	-2.1	15.0
Employment	1.9	-4.0
Unemployment (%-points)	-0.9	2.2
Current account (bill 91.kr)	-7.7	63.5
Macro average tax rate(%-points)	-2.5	-2.1

1) Includes net change in inventories

Table 3 shows the difference that the deviation of fiscal policy from the reference path made to key macroeconomic variables. The table is produced by comparing two model simulations: one where the exogenous policy variables follow the reference path and one where they follow the actual historical path. The latter reproduces the actual path of the endogenous variables, as the error terms in the equations have been set at their historical values. The

effect of the policy change on domestic demand (3.7 per cent) was considerably less than the change in the structural deficit reported by the government (-5.6 per cent). The effect on GDP was even smaller (2.4 per cent), since some of the increased demand spilled over into imports. The fiscal expansion resulted in an increase in total employment of 38,000 persons (1.9 per cent). Labour supply increased by 18,000. Unemployment was thus reduced by 20,000 persons, or 0.9 per cent of the labour force[6].

Tax reductions (including those in local taxes) and increases in transfers to households accounted for more than half of the fiscal expansion. They raised private consumption and investment in housing. In MODAG reduced direct taxes also have a direct, negative effect on gross wages. This dampens the increase in household disposable incomes by redistributing income towards profits. Furthermore, in the consumption submodel the effect of increased disposable income takes fairly long time to spread to consumption and housing investment. Savings were also stimulated by a slight decline in inflation (due to lower wage costs), which raised real interest rates.

The fairly strong positive effect on private investment is due to the combination of accelerator effects and higher profits. Profits increased both because of lower wages and because of the increase in subsidies.

5.3 The final effect of the expansionary policy on the budget

We are now ready to return to Table 2 to look at the effects that the policy change had on the central government budget after the expansionary effects on the economy have been taken account of. This is shown in the third column of the table.

While the immediate impact of the change in fiscal policy amounted to a reduction in the budget surplus of 26 billion 1991 kroner, the total effect of the policy taking account of all repercussions was 72 per cent of this (18.8 billion). The most striking feature when we look more closely at column 3 is that so much of the original expenditure came back in the form of reduced transfers to local government and so little in the form of increased tax revenue to the central government.

The expansionary policy increased total taxable income. However, pre tax income was shifted from labour to profits as the tax reductions lead to lower gross wages. The central government taxes wages much more heavily than profits, while at the local level tax rates for the two

types of income are nominally the same. Furthermore a large share of the increase in transfers to households were in child benefits, which are not taxable income. This explains why, in spite of the expansion, the final loss of revenue from direct taxes to the central government was just 1.1 billion kroner lower than the original tax reductions. It also points to that the tax revenues of local governments must have increased substantially as a result of the expansionary policy. In fact it is estimated that local government received 2.3 billion in extra tax revenue, and this explains almost half the reduction in the need for transfers to local government.

Lower wages also lower the relative price of government consumption and investment, and in particular the price of local government consumption which is extremely labour intensive. This means a major saving in the transfers to local government of 1.7 billion kroner, and some modest savings (0.6 billion) for the central government.

The substantial reduction in transfers to households (2.7 billion kroner) is both due to increased employment and to the fact that the important transfers in the model are indexed to wages.

It is also worth noting that the fiscal expansion which started in 1988 had in 1991 already reduced the government's net interest income by 2.7 billion kroner. One way of looking at the figures would be to say that the impact of the expansionary policy on the 1991 budget, when the interest cost is taken account of, was 29 billion kroner, not 26 billion. Then one could say that just over one third of the impact effect was paid for by increased revenues and reduced expenditures.

While the structural deficit increased by 5.6 per cent of GDP as measured by the Ministry of Finance, the total effect of the policy change was an increase in the deficit of only 3.5 per cent of Mainland GDP. In this sense the increase in the structural deficit grossly exaggerates the effect of changes in policy on the budget surplus. This is partly because the structural deficit does not include the indirect effects of policy, and partly because the structural deficit is influenced by structural changes in the economy.

The above discussion reveals that the results are rather sensitive to the effect of direct taxes on wages. This is unfortunate since econometric estimates of this effect varies grossly between studies, and some have found no such shifting of taxes. (See e.g. Rødseth and Holden 1990). The main changes resulting from setting the effect of tax changes on wage changes to zero are: We would have estimated a stronger positive effect of the expansionary policy on household disposable income and on private consumption, while the expansionary

effect on private investments would have been smaller and the trade performance worse. Tax revenues of the central government would have increased. On the other hand, indexing of transfers and higher wage costs would have meant larger expenditures. Thus the effect on the gross figures in the "final" column of Table 2 could have been considerable, but it would not necessarily have made much difference for the net effects on employment and on the budget balance.

5.4 Other influences on the budget

Table 2 decomposes the actual change in the budget (col. 1) into four components: The effect of policy (col. 3), the effect of demographic change (col. 4), trend growth (col. 5), and a residual (col. 6). The figures for the effect of demographic change are produced by running a simulation where the demographic variables determining old age pensions, disability pensions, confinement benefits and family allowances were held at their 1988 levels. Also, the entitlements of new old age and disability pensioners were held at their 1988 levels in real terms. This simulation was compared to the actual development.

Demographic change and higher pension entitlements increased transfer expenditures on the 1991 budget with 4.2 billion kroner[7]. Half of this came back as increased tax revenue (including the reduced need for transfers to local government because of increased local taxes). Note that in this calculation we have neglected that demographic change may have changed the demand for public services like health care or child care.

The column "trend growth" (col. 5) is supplied to provide a benchmark. It shows the change in each item which corresponds to a real growth of two per cent per year when the consumer price index is used as a deflator. The residual (col. 6) is equal to the actual change minus the effects of trend growth, policy change and demographic change. The residual is a composite result of a number of factors; the major ones being the business cycle, structural change other than demographic, changes in relative prices along the reference path and increased petroleum revenue.

Of the positive residual for government consumption, 2.3 billion is explained by real growth of military expenditure in excess of two per cent per year. Since along our reference path non-military consumption has a real growth rate of two per cent per year, the remaining residual must be due to an increase in the relative price of government consumption along the reference path. Similarly, the negative residual for government investment must be due to a decrease in the relative price of government investment. Consumption became more expensive

mainly because real wages grew by 3 per cent along the reference path. Investment became less expensive because the recession depressed prices in the construction industry.

There was a huge drop in indirect taxes relative to the balanced growth path. The difference was 18.5 billion kroner or 3.3 per cent of Mainland GDP. This must clearly be interpreted mainly as an effect of the business cycle, as must the residual fall in revenue from direct taxes. Relative to 1988 tax revenue, the fall was three times as high in indirect as in direct taxes. The main reason was that, as seen from Table 3, the recession was much stronger in expenditure than in income. The residual increase in transfers to households must also be mainly due to the cyclic downturn. However, real wage growth along the reference path also served to dampen the fall in direct taxes and to raise transfer expenditures.

Given the way we defined an unchanged policy, the strong residual increase in transfers to local government can be interpreted as a result of cyclical factors only.

How big was the cyclical effect on the budget deficit? Since the residual in column 6 of Table 3 is a composite of several effects, we cannot tell. It is evident that finding the effect of the cycle is no simple matter. The relative movement of expenditure and income is obviously important. Even more important: Do we regard changes in relative prices and wages as part of the cycle or as structural changes? Traditional methods for cyclical correction seem to disregard the importance of relative prices and the distribution of private incomes for the government budget. As an indication of the order of magnitude of the increase in the deficit caused by the recession, we can add the residuals for direct and indirect taxes, transfers to housholds and transfers to local government. The figure is 38 billion kroner, or 7.1 per cent of Mainland GDP in 1991. Fortunately this was largely offset by the increase in petroleum revenue.

6. Conclusion

There are two sets of conclusions: One on the merits of structural and cyclically adjusted deficits, and one on the effects of the fiscal expansion in Norway from 1988 to 1991.

On the first point we note: The change in the structural deficit provided a poor measure of the effect of changed policy on the economy and on the budget deficit itself. We started with mentioning that the structural deficit increased by 5.6 per cent. Given our (debatable)

definition of policy change, the fiscal expansion effected an increase in aggregate domestic demand of only 3.7 per cent. On the other hand it increased the budget deficit by only 3.3 per cent of Mainland GDP.

Our analysis shows the importance of automatic stabilizers, in particular when it comes to the effects of fiscal policy. The budgetary impact of the fiscal expansion was reduced by one third through the indirect effects arising from an increased tax base and reduced demand for transfers. Then even the interest cost of the increased deficit has been taken account of.

When we exclude oil revenues the total increase in the budget deficit was 56 billion kroner. Of this we attribute 34 per cent to changed policy, and 5 per cent to demographic change. The remaining 61 per cent (34.5 billion kroner) must be due to cyclical factors, structural change other than demographic, and the accumulation of interest (which played a minor role over the period). Allowing both structural and cyclical factors to deteriorate the budget balance to this extent must certainly have contributed strongly to stabilize the level of activity in the Norwegian economy over the years 1988 to 1991.

How successful was the activist fiscal policy in dampening the decline of the economy? According to MODAG it raised employment by 38 000 persons or 1.9 per cent[8]. However, in terms of the budget deficit it was not very cost effective[9]. For each of the extra jobs created, the policy resulted in 1991 in an increased deficit of 492,000 kroner. This should be compared to the wage cost of an average government employee, which was 229,000 kroner (gross) per man year.

One reason for the high budgetary cost was the particular policy mix: Reduced taxes and increased transfers accounted for more than two thirds of the expansion. The increase in government consumption and investment was concentrated on purchases from the private sector. This profile may have given other advantages, but it certainly did reduce the employment effect of the policies relative to the budgetary effect. It is also fair to point out that the slow response of private consumption and investment in MODAG means that the full expansionary effect of the policies from 1988 to 1991 had not yet materialized in 1991.

Notes:

1. Military consumption along the reference path is equal to actual consumption. On average military consumption increased in real terms by 5.6 per cent per year from 1988 to 1991. This was a significantly higher growth than the average from 1980 to 1988. The growth was mainly due to increased expenditure on imported military equipment. Because the imports tend to arrive in big lumps, the yearly variation in military consumption is extreme and somewhat arbitrary. Letting military consumption grow by two per cent along the reference path would have given an exaggerated picture of the budgetary cost of the expansionary policy since 1989. Most of the extra military consumption was a result of procurement decisions made earlier. However, we miss out some military construction work which was part of the expansionary policy. There was also an extra intake of conscripts, which kept some young men outside the regular labour market.

2. That the bulk of subsidies is treated as lump sums is a disadvantage of MODAG when it comes to estimating the effects of the policy change. Among the effects we miss are the positive employment effects of subsidies to in-firm training and similar labour market measures. The average number of employees on labour market programs which involve subsidies to firms increased from 682 in 1988 to 8,127 in 1991. (Source: NOS Labour Market Statistics 1991, Table 84). We also miss the incentive effects of interest rate subsidies to housing construction, and effects on household disposable income. Improving the model's treatment of subsidies is difficult without first improving the National Accounts.

3. They are also free to set the level of their charges for certain services. These charges increased considerably in the period we look at. Unfortunately the effects of local charges are poorly modeled in MODAG.

4. A marginal propensity to spend equal to one may seem an extreme assumption, since the actual growth was considerably greater in income than in expenditure. We may overestimate the expansionary effect of the increase in transfers to local government, but this potential error has a negligible effect on the aggregate results.

5. That subsidies increased may come as a surprise to some, since it was a stated policy to reduce subsidies. Indeed many subsidies were reduced. Because of the myriad of different industry subsidies it is not easy to get a clear picture. However, it is evident that there was a large increase both absolutely and relatively in interest rate subsidies to state banks. Furthermore, there was a large absolute (small relative) increase in agricultural subsidies. Some special labour market measures (like in-firm training) are also accounted as subsidies. MODAG may underestimate the expansionary effects of some of the subsidies (by treating them as lump sums). Some of the growth in industry subsidies may be endogenous; e.g. depending on the harvest (agriculture) or the number of students (the state bank providing student loans).

6. Part of the policy was to increase student capacity in labour market training and in ordinary education. This probably reduced measured labour supply in ways that are not accounted for in MODAG. If we add in this reduction in labour supply, the estimated policy effect on unemployment will be greater. The number of students in secondary schools increased by 50,000 and in universities and colleges by 37,000 from 1988 to 1991. The number of participants in labour market training programs increased by 24,600. The net effect of these numbers on the size of the labour force is not known.

7. The gross change was somewhat higher, since the expansionary effect of the original increase in pensions meant that transfers to the unemployed could be reduced.

8. The estimate is of course surrounded by uncertainty, and may be biased downwards to some extent by most subsidies being treated as lump sums in MODAG.

9. The social costs are another matter. The policy provided traing for a large number of people, investments in infrastructure, increased private and public consumption etc. Even if the budgetary cost per job was high, the social benefits may have exceeded the social costs, but this is a matter we have note addressed.

References:

Artis, M. J., R. Bladen-Hovell, E. Karakitsos and B. Dwolatzky: The effects of economic policy 1979-1982, *National Institute Economic Review*, 108, 1984, pp. 54-67.

Blanchard, O., J.-C. Choraqui, R.P. Hagemann and N. Sartor: The sustainability of fiscal policy: New answers to an old question. *OECD Economic Studies*, 15, 1990.

Bowitz, E.: Offentlige stønader til private. En økonometrisk undersøkelse og modellanalyse. *Sosiale og Økonomiske studier fra Statistisk sentralbyrå*, 80, 1992.

Buiter, W.: A guide to public sector debt and deficits. *Economic policy*, April 1989, pp. 14-79.

Cappelen, Å: "MODAG. A macroeconometric model of the Norwegian economy" in L. Bergman and Ø. Olsen (eds.) *Economic modelling in the Nordic countries*, North Holland, Amsterdam 1992, pp. 55-93.

Eika, T: "Faktorer bak økningen i arbeidsledigheten 1988-1991", *Økonomiske analyser*, 2, 1993, pp. 11-18.

Price, R.W.R. and P. Muller: "Structural budget indicators and the interpretation of fiscal policy in OECD economies." *OECD Economic Studies*, 3, 1984, pp. 27-72.

Rødseth, A. and S. Holden: "Wage Formation in Norway" in L. Calmfors (ed.): *Wage Formation in the Nordic Countries*, Oxford, Oxford Univ. Press 1990, pp. 237-280.

Wallis, K.F. and J.D. Whitley: "Counterfactual analysis with macroeconometric models: The UK economy, 1979-84." Discussion Paper No. 29, ESRC Macroeconomic Modelling Bureau, University of Warwick, June 1992.

22

ISSUED IN THE SERIES DISCUSSION PAPER

No. 1   *I. Aslaksen and O. Bjerkholt (1985):* Certainty Equivalence Procedures in the Macroeconomic Planning of an Oil Economy.

No. 3   *E. Biørn (1985):* On the Prediction of Population Totals from Sample surveys Based on Rotating Panels.

No. 4   *P. Frenger (1985):* A Short Run Dynamic Equilibrium Model of the Norwegian Production Sectors.

No. 5   *I. Aslaksen and O. Bjerkholt (1985):* Certainty Equivalence Procedures in Decision-Making under Uncertainty: An Empirical Application.

No. 6   *E. Biørn (1985):* Depreciation Profiles and the User Cost of Capital.

No. 7   *P. Frenger (1985):* A Directional Shadow Elasticity of Substitution.

No. 8   *S. Longva, L. Lorentsen and Ø. Olsen (1985):* The Multi-Sectoral Model MSG-4, Formal Structure and Empirical Characteristics.

No. 9   *J. Fagerberg and G. Sollie (1985):* The Method of Constant Market Shares Revisited.

No. 10   *E. Biørn (1985):* Specification of Consumer Demand Models with Stochastic Elements in the Utility Function and the first Order Conditions.

No. 11   *E. Biørn, E. Holmøy and Ø. Olsen (1985):* Gross and Net Capital, Productivity and the form of the Survival Function. Some Norwegian Evidence.

No. 12   *J.K. Dagsvik (1985):* Markov Chains Generated by Maximizing Components of Multidimensional Extremal Processes.

No. 13   *E. Biørn, M. Jensen and M. Reymert (1985):* KVARTS - A Quarterly Model of the Norwegian Economy.

No. 14   *R. Aaberge (1986):* On the Problem of Measuring Inequality.

No. 15   *A.-M. Jensen and T. Schweder (1986):* The Engine of Fertility - Influenced by Interbirth Employment.

No. 16   *E. Biørn (1986):* Energy Price Changes, and Induced Scrapping and Revaluation of Capital - A Putty-Clay Model.

No. 17   *E. Biørn and P. Frenger (1986):* Expectations, Substitution, and Scrapping in a Putty-Clay Model.

No. 18   *R. Bergan, Å. Cappelen, S. Longva and N.M. Stølen (1986):* MODAG A - A Medium Term Annual Macroeconomic Model of the Norwegian Economy.

No. 19   *E. Biørn and H. Olsen (1986):* A Generalized Single Equation Error Correction Model and its Application to Quarterly Data.

No. 20   *K.H. Alfsen, D.A. Hanson and S. Glomsrød (1986):* Direct and Indirect Effects of reducing SO_2 Emissions: Experimental Calculations of the MSG-4E Model.

No. 21   *J.K. Dagsvik (1987):* Econometric Analysis of Labor Supply in a Life Cycle Context with Uncertainty.

No. 22   *K.A. Brekke, E. Gjelsvik and B.H. Vatne (1987):* A Dynamic Supply Side Game Applied to the European Gas Market.

No. 23   *S. Bartlett, J.K. Dagsvik, Ø. Olsen and S. Strøm (1987):* Fuel Choice and the Demand for Natural Gas in Western European Households.

No. 24 *J.K. Dagsvik and R. Aaberge (1987)*: Stochastic Properties and Functional Forms of Life Cycle Models for Transitions into and out of Employment.

No. 25 *T.J. Klette (1987)*: Taxing or Subsidising an Exporting Industry.

No. 26 *K.J. Berger, O. Bjerkholt and Ø. Olsen (1987)*: What are the Options for non-OPEC Countries.

No. 27 *A. Aaheim (1987)*: Depletion of Large Gas Fields with Thin Oil Layers and Uncertain Stocks.

No. 28 *J.K. Dagsvik (1987)*: A Modification of Heckman's Two Stage Estimation Procedure that is Applicable when the Budget Set is Convex.

No. 29 *K. Berger, Å. Cappelen and I. Svendsen (1988)*: Investment Booms in an Oil Economy -The Norwegian Case.

No. 30 *A. Rygh Swensen (1988)*: Estimating Change in a Proportion by Combining Measurements from a True and a Fallible Classifier.

No. 31 *J.K. Dagsvik (1988)*: The Continuous Generalized Extreme Value Model with Special Reference to Static Models of Labor Supply.

No. 32 *K. Berger, M. Hoel, S. Holden and Ø. Olsen (1988)*: The Oil Market as an Oligopoly.

No. 33 *I.A.K. Anderson, J.K. Dagsvik, S. Strøm and T. Wennemo (1988)*: Non-Convex Budget Set, Hours Restrictions and Labor Supply in Sweden.

No. 34 *E. Holmøy and Ø. Olsen (1988)*: A Note on Myopic Decision Rules in the Neoclassical Theory of Producer Behaviour, 1988.

No. 35 *E. Biørn and H. Olsen (1988)*: Production - Demand Adjustment in Norwegian Manufacturing: A Quarterly Error Correction Model, 1988.

No. 36 *J.K. Dagsvik and S. Strøm (1988)*: A Labor Supply Model for Married Couples with Non-Convex Budget Sets and Latent Rationing, 1988.

No. 37 *T. Skoglund and A. Stokka (1988)*: Problems of Linking Single-Region and Multiregional Economic Models, 1988.

No. 38 *T.J. Klette (1988)*: The Norwegian Aluminium Industry, Electricity prices and Welfare, 1988.

No. 39 *I. Aslaksen, O. Bjerkholt and K.A. Brekke (1988)*: Optimal Sequencing of Hydroelectric and Thermal Power Generation under Energy Price Uncertainty and Demand Fluctuations, 1988.

No. 40 *O. Bjerkholt and K.A. Brekke (1988)*: Optimal Starting and Stopping Rules for Resource Depletion when Price is Exogenous and Stochastic, 1988.

No. 41 *J. Aasness, E. Biørn and T. Skjerpen (1988)*: Engel Functions, Panel Data and Latent Variables, 1988.

No. 42 *R. Aaberge, Ø. Kravdal and T. Wennemo (1989)*: Unobserved Heterogeneity in Models of Marriage Dissolution, 1989.

No. 43 *K.A. Mork, H.T. Mysen and Ø. Olsen (1989)*: Business Cycles and Oil Price Fluctuations: Some evidence for six OECD countries. 1989.

No. 44 *B. Bye, T. Bye and L. Lorentsen (1989)*: SIMEN. Studies of Industry, Environment and Energy towards 2000, 1989.

No. 45 *O. Bjerkholt, E. Gjelsvik and Ø. Olsen (1989)*: Gas Trade and Demand in Northwest Europe: Regulation, Bargaining and Competition.

No. 46 *L.S. Stambøl and K.Ø. Sørensen (1989)*: Migration Analysis and Regional Population Projections, 1989.

No. 47 *V. Christiansen (1990)*: A Note on the Short Run Versus Long Run Welfare Gain from a Tax Reform, 1990.

No. 48   *S. Glomsrød, H. Vennemo and T. Johnsen (1990)*: Stabilization of Emissions of CO_2: A Computable General Equilibrium Assessment, 1990.

No. 49   *J. Aasness (1990)*: Properties of Demand Functions for Linear Consumption Aggregates, 1990.

No. 50   *J.G. de Leon (1990)*: Empirical EDA Models to Fit and Project Time Series of Age-Specific Mortality Rates, 1990.

No. 51   *J.G. de Leon (1990)*: Recent Developments in Parity Progression Intensities in Norway. An Analysis Based on Population Register Data.

No. 52   *R. Aaberge and T. Wennemo (1990)*: Non-Stationary Inflow and Duration of Unemployment.

No. 53   *R. Aaberge, J.K. Dagsvik and S. Strøm (1990)*: Labor Supply, Income Distribution and Excess Burden of Personal Income Taxation in Sweden.

No. 54   *R. Aaberge, J.K. Dagsvik and S. Strøm (1990)*: Labor Supply, Income Distribution and Excess Burden of Personal Income Taxation in Norway.

No. 55   *H. Vennemo (1990)*: Optimal Taxation in Applied General Equilibrium Models Adopting the Armington Assumption.

No. 56   *N.M. Stølen (1990)*: Is there a NAIRU in Norway?

No. 57   *Å. Cappelen (1991)*: Macroeconomic Modelling: The Norwegian Experience.

No. 58   *J. Dagsvik and R. Aaberge (1991)*: Household Production, Consumption and Time Allocation in Peru.

No. 59   *R. Aaberge and J. Dagsvik (1991)*: Inequality in Distribution of Hours of Work and Consumption in Peru.

No. 60   *T.J. Klette (1991)*: On the Importance of R&D and Ownership for Productivity Growth. Evidence from Norwegian Micro-Data 1976-85.

No. 61   *K.H. Alfsen (1991)*: Use of Macroeconomic Models in Analysis of Environmental Problems in Norway and Consequences for Environmental Statistics.

No. 62   *H. Vennemo (1991)*: An Applied General Equilibrium Assessment of the Marginal Cost of Public Funds in Norway.

No. 63   *H. Vennemo (1991)*: The Marginal Cost of Public Funds: A Comment on the Literature.

No. 64   *A. Brendemoen and H. Vennemo (1991)*: A climate convention and the Norwegian economy: A CGE assessment.

No. 65   *K. A. Brekke (1991)*: Net National Product as a Welfare Indicator.

No. 66   *E. Bowitz and E. Storm (1991)*: Will Restrictive Demand Policy Improve Public Sector Balance?

No. 67   *Å. Cappelen (1991)*: MODAG. A Medium Term Macroeconomic Model of the Norwegian Economy.

No. 68   *B. Bye (1992)*: Modelling Consumers' Energy Demand.

No. 69   *K. H. Alfsen, A. Brendemoen and S. Glomsrød (1992)*: Benefits of Climate Policies: Some Tentative Calculations.

No. 70   *R. Aaberge, Xiaojie Chen, Jing Li and Xuezeng Li (1992)*: The Structure of Economic Inequality among Households Living in Urban Sichuan and Liaoning, 1990.

No. 71   *K.H. Alfsen, K.A. Brekke, F. Brunvoll, H. Lurås, K. Nyborg and H.W. Sæbø (1992)*: Environmental Indicators.

No. 72   *B. Bye and E. Holmøy (1992)*: Dynamic Equilibrium Adjustments to a Terms of Trade Disturbance

No. 73   *O. Aukrust (1992)*: The Scandinavian Contribution to National Accounting

No. 74   *J. Aasness, E, Eide and T. Skjerpen (1992)*: A Criminometric Study Using Panel Data and Latent Variables

No. 75   R. Aaberge and Xuezeng Li (1992): The
          Trend in Income Inequality in Urban
          Sichuan and Liaoning, 1986-1990

No. 76   J.K. Dagsvik and Steinar Strøm (1992):
          Labor Supply with Non-convex Budget
          Sets, Hours Restriction and Non-pecun-
          iary Job-attributes

No. 77   J.K. Dagsvik (1992): Intertemporal Dis-
          crete Choice, Random Tastes and Func-
          tional Form

No. 78   H. Vennemo (1993): Tax Reforms when
          Utility is Composed of Additive Func-
          tions.

No. 79   J. K. Dagsvik (1993): Discrete and Con-
          tinuous Choice, Max-stable Processes and
          Independence from Irrelevant Attributes.

No. 80   J. K. Dagsvik (1993): How Large is the
          Class of Generalized Extreme Value Ran-
          dom Utility Models?

No. 81   H. Birkelund, E. Gjelsvik, M. Aaserud
          (1993): Carbon/energy Taxes and the
          Energy Market in Western Europe

No. 82   E. Bowitz (1993): Unemployment and the
          Growth in the Number of Recipients of
          Disability Benefits in Norway

No. 83   L. Andreassen (1993): Theoretical and
          Econometric Modeling of Disequilibrium

No. 84   K.A. Brekke (1993): Do Cost-Benefit
          Analyses favour Environmentalists?

No. 85   L. Andreassen (1993): Demographic
          Forecasting with a Dynamic Stochastic
          Microsimulation Model

No. 86   G.B. Asheim and K.A. Brekke (1993):
          Sustainability when Resource Manage-
          ment has Stochastic Consequences

No. 87   O. Bjerkholt and Yu Zhu (1993): Living
          Conditions of Urban Chinese Households
          around 1990

No. 88   R. Aaberge (1993): Theoretical Foun-
          dations of Lorenz Curve Orderings

No. 89   J. Aasness, E. Biørn and T. Skjerpen
          (1993): Engel Functions, Panel Data, and
          Latent Variables - with Detailed Results

No. 90   Ingvild Svendsen (1993): Testing the
          REH. Using Norwegian Microeconomic
          Data (Will be issued later)

No. 91   Einar Bowitz, Asbjørn Rødseth and Erik
          Storm (1993): Fiscal Expansion, the
          Budget Deficit and the Economy:
          Norway 1988-91

No. 92   Rolf Aaberge, Ugo Colombino and
          Steinar Strøm (1993): Labor Supply in
          Italy

No. 93   Tor Jakob Klette (1993): Is Price Equal
          to Marginal Costs? An Integrated Study
          of Price-Cost Margins and Scale Econo-
          mies among Norwegian Manufacturing
          Establishments 1975-90.

No. 94   John K. Dagsvik (1993): Choice Probabi-
          lities and Equilibrium Conditions in a
          Matching Market with Flexible Contracts

No. 95   Tom Kornstad (1993): Empirical Ap-
          proaches for Analysing Consumption and
          Labour Supply in a Life Cycle Perspec-
          tive

No. 96   Tom Kornstad (1993): An Empirical Life
          Cycle Model of Savings, Labour Supply
          and Consumption without Intertemporal
          Separability

No. 97   Snorre Kverndokk (1993): Coalitions and
          Side Payments in International CO_2 Trea-
          ties

No. 98   Torbjørn Eika (1993): Wage Equations in
          Macro Models. Phillips Curve versus
          Error Correction Model Determination of
          Wages in Large-Scale UK Macro Models

No. 99   Anne Brendemoen and Haakon Vennemo
          (1993): The Marginal Cost of Funds in
          the Presence of External Effects