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Title: Summary of Danish tax policy 1986-2002[1]

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Abstract

The paper reviews the content and results of 1½ decade of tax reform in Denmark. By means of microeconomic indicators it is demonstrated how the reforms have affected household incentives and contributed to increased private sector savings as well as increased labour supply. The impact on income distribution indicates that the reforms have succeeded in reducing distortions without compromising distributional objectives. Lower marginal tax rates on labour and capital income have been balanced by tax base broadening. Possible future tax reforms will involve significantly harder trade-offs between efficiency and distributional objectives, as the scope for broadening the tax base further is limited.

[1] The views and analyses presented in the working paper series are the sole responsibility of the authors. The papers may therefore include views, which are not necessarily shared by the Ministry of Finance.

Trends in Danish tax policy 1986-2002[2]

1. Introduction

The first major tax reform of 1987 marked the beginning of significant changes in the Danish tax system. The process has been followed by additional tax reforms phased in from 1994 and 1999.

The three reforms are based on the same comprehensive principle of tax base broadening and marginal tax rate reduction, elimination of loopholes and the introduction of new green taxes, financing lower income tax rates.

Average marginal effective tax rates on labour income for fully employed individuals have declined from about 58 per cent in 1986 to 54 per cent in 2002 – when the most recent reform is fully implemented.

Average marginal effective tax rates on negative net capital income will decline from around 55 per cent in 1986 to 33 per cent in 2002.

From 1986 to 2002 lower marginal tax rates on labour income are estimated to increase aggregate annual hours of work by some 1½ per cent compared to what it otherwise would have been.

The lowering of the marginal effective tax rate on negative net capital income is estimated to increase household savings by 1½-2 per cent of GDP annually.

Tax base broadening – and higher local government tax rates – increased average tax rates on total wage, transfer and capital income. Wage income, however, now on average is taxed at a lower level than prior to the reforms. However, as the majority of capital income is negative, the lowering of tax rates on capital income lead to an overall increase in average personal income taxation. For fully employed individuals, the average tax rate has increased from around 35 per cent in 1986 to 39 per cent in 2002, an increase which mostly took place before 1993.

The increase in average tax rates is especially pronounced for higher income households as these groups benefited most from previous narrow tax bases and loopholes in the tax system. The reforms have thus contributed to a more equal distribution of income.

[2] This paper is based largely on chp. 8 in Medium Term Economic Survey 1998/99, Ministry of Finance, 199x.

2. Overview of the tax reforms

Prior to the first tax reform in 1987 the Danish tax system was characterised by high marginal tax rates and fairly narrow tax bases. Personal income taxation was based on a single income definition, taxable income, which included all types of income and deductions.

In this system negative capital income was taxed at the margin for all households, implying very low or negative real-after tax interest rates on household savings.

The tax system also contained loopholes, which narrowed the tax base, such as tax exemption of certain capital gains on shares.

The corresponding high marginal tax rates on wage income and very generous deductions for especially interest expenditures caused severe distortions in terms of low labour supply and low private sector financial savings.

The tax reforms since 1986 have created a more sustainable and less distorting tax system. The guiding principle behind all three reforms has been to reduce personal income tax rates and broaden tax bases, *cf. box 1.*

Box 1. Key elements in the reforms of personal income taxation.

The tax system prior to 1987:
Household income taxation was levied on one tax base, taxable income, which was taxed progressively at three brackets. This implied a narrow tax base at all tax levels due to various deductions, including full deductibility of negative net capital income.

The tax system after the 1987, 1994 and 1999-reform

- Introduction of a dual system with new tax bases, personal income (labour income and transfer income less net contributions to pension schemes), capital income (interest income less interest expenditures) and itemized deductions (e.g. transportation costs), where personal income and positive net capital income are taxed progressively.
- Introduction of employer and employee labour market contributions and a special pension contribution at, respectively, 8 per cent and 1 per cent of total wage cost. Both are deductible in the income tax.
- Allowances and negative net capital income is taxed at the lowest tax rate.

The reforms have been broadly revenue neutral (ex ante), but involved a shift in the structure of taxation from labour income to the consumption of natural resources by lowering personal income taxation and increasing green taxes, *cf. table 1.* The intention to lower income taxation has, however, partly been offset by gradually increasing local government tax rates during the period.

The increase in corporate taxation in the reforms has been offset by other measures over the period, in particular a general decrease in the corporate tax rate from 50 per cent in 1987 to 30 per cent in 2001.

Table 1. Revenue implications of 3 tax reforms

1998-price level	1987	1994	1999	Total
		Bill. DDK		
Personal income taxation[1]	*-9,8*	*-20,8*	*-0,7*	*-31,3*
- tax rates..	-12,2	-27,5	-5,0	-44,7
- tax base	2,4	6,7	4,3	13,4
Corporate taxation..................................	*11,5*	*1,9*	*0,4*	*13,8*
- tax rates..	9,5	-1,0	0,0	8,4
- tax base	2,0	3,0	0,4	5,4
Green taxes	*0,0*	*14,7*	*5,8*	*20,6*
- tax rates..	0,0	10,3	5,8	16,2
- tax base	0,0	4,4	0,0	4,5
Miscellaneous.	*0,0*	*-0,2*	*1,5*	*1,4*
- tax rates..	0,0	-0,2	1,5	1,4
- tax base	0,0	0,0	0,0	0,0
Total revenue	*1,7*	*-4,5*	*7,1*	*4,4*
- tax rates..	-2,7	-18,3	2,2	-18,7
- tax base	4,4	13,8	4,9	23,2

Note: Based on unchanged behaviour.
1) Including labour market contributions and property taxation.
Source: Ministry of Taxation and own calculations.

2. Marginal effective tax rates on labour income

Statutory marginal effective tax rates
Since 1986 statutory tax rates have been cut within all tax brackets. The highest marginal tax rate has been lowered from 73 per cent in 1986 to 63 per cent in 2002, *cf. table 2.* Within that period the average local government tax rate increased by 5,1 percentage point, thus almost offsetting the overall reduction of marginal tax rates.

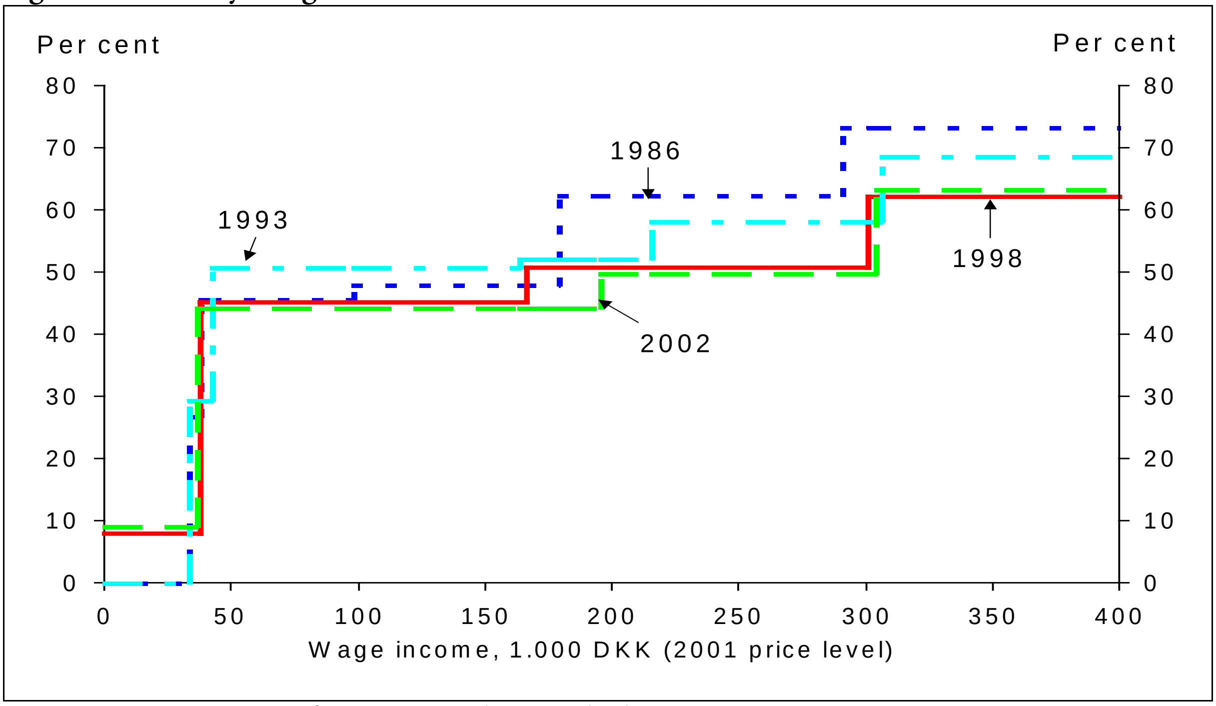
Table 2. Statutory effective marginal tax rates on wage income

	1986	1993	1998	2002	Change 1986-2002
		Per cent			Percentage points
Personal income					
- lowest level	48.0	50.6	45.2	44.3	-3.7
- intermediate level	62.4	58.2	50.7	49.7	-12.7
- top rate	73.2	68.7	62.0	63.3	-9.8
Difference, high-low................	25.2	18.1	16.8	19.0	-6.2
Income deductions (tax value)	48.0-73.2	52.2	40.4	33.2	-14.8 - 40.0
Avg. local government tax rate	28.1	30.2	32.4	33.2	5.1

Note: Tax rates include labour market contributions and the special pension contribution.
Source: Ministry of Taxation and own calculations.

The size and position of the various tax brackets have not changed significantly over the period as a whole. The highest bracket starts at incomes around DKK 300.000, slightly above the APW[3] level, *cf. figure 1*. The lower threshold for the mid-income bracket has been increased, then reduced and increased again and now lies around DKK 200.000, slightly below the level prior to the tax reforms. Finally, the introduction of a payroll tax on all labour income implies, that income below the previous personal allowance of some DDK 35.000 is taxed at 9 per cent.

Figure 1: Statutory marginal tax rates on labour income, 1986-2002



Source: Ministry of Taxation and own calculations.

Average marginal effective tax rates on labour income

Although the position of tax brackets have been left broadly unchanged, the tax base broadening measures have implied that a larger fraction of the taxpayers have moved from the lowest to one of the two progressive tax brackets, *cf. table 2.*

Currently over 40 per cent of full-time wage earners are subject to taxation at the highest level, which constitutes a significant increase compared to 1986, *cf. table 2.* Accordingly, the share of full-time employees not subject to progressive taxation has decreased from around 35 per cent in 1986 to 12 per cent in 2002.

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[3] Average production worker

Table 2. Distribution of taxpayers across tax brackets.

	1986	1993	1998	2002	Change 1986-2002
		Per cent			Percentage points
- lowest tax brackets..............	51.0	42.8	26.0	32.9	-18.1
- medium tax brackets	39.2	37.5	49.9	39.7	0.5
- highest tax brackets	9.8	19.7	24.1	27.4	17.6
Total, persons aged 25-59.....	**100.0**	**100.0**	**100.0**	**100.0**	**0.0**
- lowest tax brackets..............	35.4	22.8	9.1	11.9	-23.5
- medium tax brackets	51.0	46.9	54.2	46.5	-4.5
- highest tax brackets	13.6	30.3	36.7	41.6	28.0
Total, fully employed persons	**100.0**	**100.0**	**100.0**	**100.0**	**0.0**

Source: Ministry of Taxation and own calculations.

The average marginal effective tax rate for fully employed individuals has declined by around 3 percentage points from approximately 58 per cent in 1986 to approximately 54 per cent in 2002, *cf. table 3*. For the whole group of 25-59 year old, the decline has been about 2 percentage points.

The decline in statutory tax rates is thus partly counteracted by taxpayers moving upwards on the tax scale.

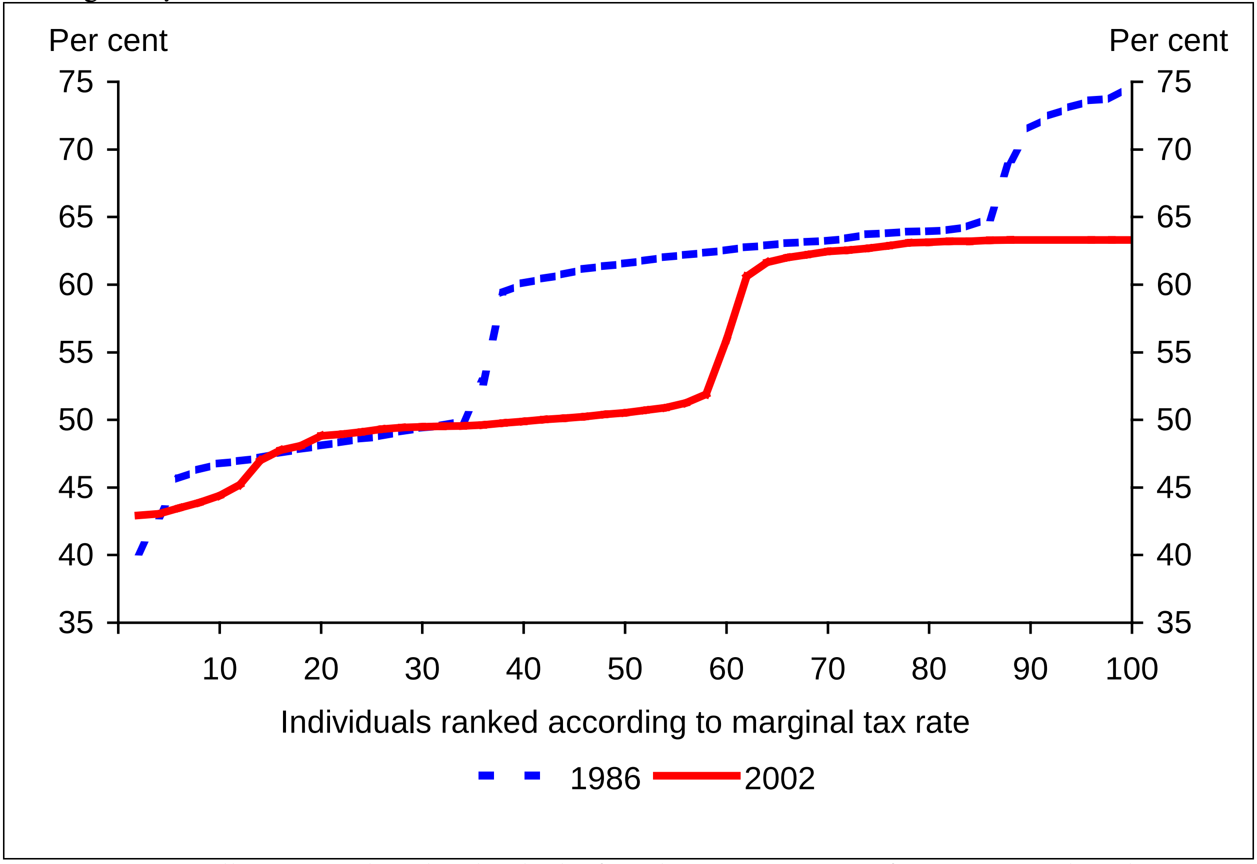
Table 3. Average marginal effective tax rates on labour income.

	1986	1993	1998	2002	Change 1986-2002
		Per cent			Percentage points
25-59 year-olds......................	53.0	53.6	51.7	51.0	-2.0
- Fully employed....................	57.7	59.3	54.3	54.4	-3.3

Source: Ministry of Taxation and own calculations

This feature of the tax reforms can also be illustrated by the distribution of full-time employees according to individual actual marginal tax rates, *cf. figure 2.* The reforms have thus reduced actual marginal tax rates at the middle and the top of the income distribution, while leaving marginal tax rates elsewhere roughly unchanged.

Figure 2. Distribution of actual marginal tax rates on labour income fully employed aged 25 through 59 years.



Note: Full-time employed individuals, for whom income transfers constitute less than 10 per cent of pre-tax income.
Source: Ministry of Taxation and own calculations.

Marginal tax rates on capital income
The tax reforms have reduced statutory tax rates on capital income considerably, in particular on negative net capital income, where the average tax rate has declined from 48 per cent in 1986 to 33 per cent in 2002, *cf. table 4*. When weighted by the size of interest expenditures the decline is slightly larger – 16 percentage points from 48 per cent – since those with relatively large interest expenditures, typically interest on mortgages, also have relatively high incomes.

Due to the continued progressive taxation of positive net capital income the drop in marginal tax rates on positive net capital income has been less pronounced. The average marginal tax rate on positive net capital income has decreased from approximately 53 per cent in 1986 to approximately 41 per cent in 2002.

Table 4. Statutory and effective marginal tax rates on capital income.

	1986	1993	1998	2002	Change 1986-2002
Statutory rates:		Per cent			Percentage points
Positive net capital income					
- lowest tax bracket.............	48.0	52.2	40.4	38.7	-9.3
- intermediate tax bracket	62.4	58.2	46.4	44.7	-17.7
- highest tax bracket............	73.2	58.2	58.7	59.7	-13.4
Negative net capital income					
- lowest tax bracket.............	48.0	52.2	40.4	33.2	-14.8
- intermediate tax bracket	62.4	52.2	46.4	33.2	-29.2
- highest tax bracket............	73.2	52.2	46.4	33.2	-40.0
Effective rates:					
Positive capital income	53.2	49.9	43.2	41.2	-12.0
Negative capital income	48.4	45.2	43.2	32.9	-15.5
Pension savings	44.1	50.1	35.8	15.0	-29.1

Source: Ministry of Taxation and own calculations.

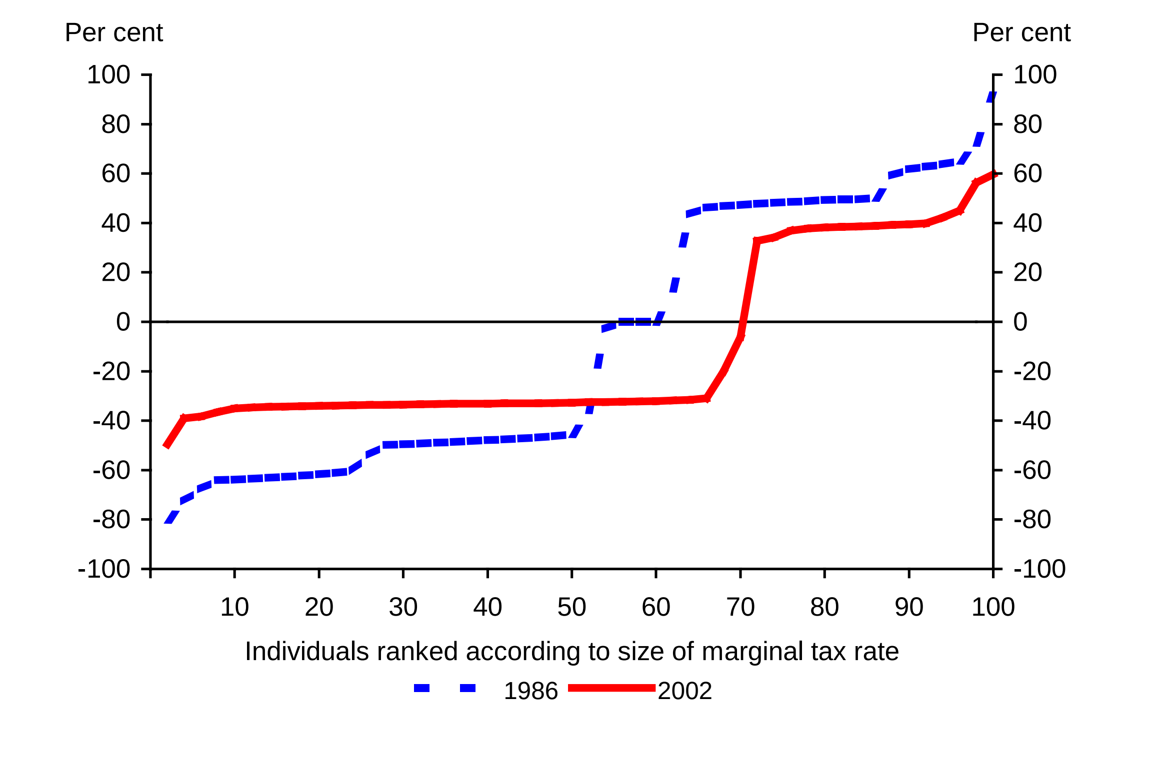
From 1983 onwards the yield on bonds in funded pension schemes was taxed at a variable rate, indexed to the real interest rate. In 2000 the variable tax rate was replaced by a fixed tax rate of 26 per cent, which was recently further reduced to 15 per cent.

This means that in 2002 tax incentives for pension savings are preserved for most households, even though marginal tax rates on other capital income have been significantly reduced.

The changes in capital income taxation have changed the distribution of marginal tax rates on capital income considerably since 1986, *cf. figure 3*.

Prior to the tax reforms, marginal tax rates on both negative and positive net capital income typically were in the range between 50 and 70 per cent. After the tax reforms, marginal rates for the large majority of tax payers are below 40 per cent. A minority of taxpayers with positive net capital income are subject to progressive taxation, reflecting the asymmetric taxation of positive and negative net capital income, where the former is taxed progressively, while the latter is taxed at a flat rate.

Figure 3. Distribution of actual marginal tax rates on capital income, all taxpayers.



Source: Ministry of Taxation and own calculations. The negative marginal tax rate in the lower panel represents taxpayers with negative net capital income.

4. Structural implications

The decrease in marginal tax rates on labour and capital income has lead to structural improvements in the economy through improved incentives to supply labour and increased private sector financial savings.

Based on a labour supply elasticity of 0.2[4] a reduction of the marginal effective tax rate on labour income from nearly 58 per cent in 1986 to 54 per cent in 2002 can be estimated to increase performed working hours by some 1½ per cent, *cf. table 5.*

Previous Danish analysis of the relationship between the after tax real interest rate and private sector financial savings indicate that a 1 percentage point increase in the after tax real interest rate would increase the ratio of private sector financial savings to GDP by 1 percentage point.

This indicates that the decrease in the marginal effective tax rate on negative net capital income from 48 per cent in 1986 to 33 per cent in 2002 would add 1.1 percentage points of GDP to estimated private sector financial savings.

[4] Resent empirical studies suggest substantial uncertainty regarding the magnitude of the wage elasticity.

Table 5. Marginal tax rates and implications for private sector financial savings and labour supply.

	Private sector financial saving, Per cent of GDP	Labour supply, Per cent of performed working hours.
Change in marginal tax rate, per cent	-15.5	-3.3
Total effect	1.1	1.6

Source: Ministry of Taxation and own calculations.

5. Average taxation

From 1986 to 2002 average taxation of personal income for persons aged 25-59 years will increase by approximately 3 percentage points, *cf. table 6.*

The increase in average income tax rates has been most pronounced for the fully employed, and reflects mainly the changes in tax-rates on negative net capital income as well as increasing income tax rates at the local government level. The combined effect of changing tax rates and behavioural responses in terms of higher private financial savings thus has contributed to increase average tax rates.

Table 6. Average tax rates in 1986, 1993 and 2002.

	1986	1993	2002	Change 1993-2002	Change 1986-2002
	--------- Per cent --------			---Percentage points---	
Persons aged 25-59 years	34.5	37.1	37.4	0.3	2.9
- fully employed	35.3	38.6	39.2	0.6	3.9

Note: The average tax rate is calculated as total personal income taxes, including labour market contributions, divided by pre-tax income including positive net capital income but excluding negative net capital income and other mainly work related, deductions.

Source: Ministry of Taxation and own calculations.

Although the tax reforms have been broadly revenue neutral (ex ante), they involved a switch in taxation away from income taxes towards indirect taxes, which has contributed to a reduction in average personal income taxation. This has, however, been offset by higher local government taxes in addition to the above mentioned effects related to the taxation of negative net capital income.

6. Distributional implications

The three tax reforms have had the relatively largest impact on disposable incomes at the lower end of the income distribution, *cf. table 7.* Among other things the reason is that the broadening of the tax base, e.g. via reduction of the tax value of interest expenditures, reduces disposable income relatively more for high-income groups. In the most recent tax reform, reduced rates on labour income are also especially targeted at individuals with relatively low incomes.

Table 7. The impact of the tax reforms on income distribution, individuals aged 18 or above. Per cent of personal pre-tax income.

Deciles.	1987-reform	1994-reform	1999-reform	Total
1..	4.0	6.0	1.1	11.1
2..	1.0	4.1	1.5	6.6
3..	1.4	3.8	1.4	6.6
4..	1.4	3.6	1.3	6.3
5..	1.4	2.6	1.3	5.4
6..	1.3	2.3	1.3	4.9
7..	1.0	2.1	1.1	4.3
8..	0.8	2.3	0.9	4.0
9..	0.7	2.6	0.5	3.9
10......................................	0.7	1.9	-0.1	2.4
All.	1.0	2.5	0.8	4.3

Note: The increasing revenue from green taxes in the tax reform packages is not included in the calculations.

Source: Ministry of Taxation and own calculations.

The figures in table 7 generally overestimate the effects on disposable incomes of the tax reforms, the reforms have in general involved reduced personal income taxes and increasing revenue from green taxes. For technical reasons the effects on disposable income of changes in green taxes have not been taken into account. Indeed, since the three tax reforms taken together have been fully financed, the increase in total disposable income is significantly smaller than 4.3 per cent reported in table 7.

Also, compared to the previous table, the effects of increasing local government taxes are not included, which is a major factor behind the difference between the positive effect on disposable income and the increase in average taxation.

7. Details of the 1998 tax-reform package

The June 1998 tax reform included an adjustment of the tax system and some additional fiscal measures in order to improve long-term structures and prospects of the Danish economy and at the same time stabilise economic growth in subsequent years.

The most important features of the tax adjustment were:

- A further reduction in the tax rate of negative net capital income
- A further reduction in the tax value of mainly work related allowances
- A step-wise reduction in the lowest central government tax rate from 8 per cent in 1998 to 5½ per cent in 2002
- An increase in the middle income tax bracket threshold
- Tax on imputed rent of owner-occupied dwellings was replaced by a property value tax of 1 per cent of the assessed market value
- A fixed depreciation rate of 5 per cent on commercial buildings was introduced.
- Introduction of a 5 per cent tax on previously tax exempt yields of stocks hold in pension savings accounts
- Excise duties on energy products (petroleum products, electricity, gas and coal) are gradually increased over the period 1999-2002.

- The duty on petrol is raised in 1999 and increased further in line with expected increases in Germany.
- Taxation of interest from pension savings is reorganised, with a fixed rate of 26 per cent from 2000 replacing the previous variable rate. If the system were left unchanged the variable tax rate is expected to drop from app. 35 per cent in 1998 and 1999 to a level around 26 per cent within a few years. At the same time, the tax base is broadened by the abolishment of certain exemptions.
- Tax value of deductive pension contributions is lowered for high-income earners.

The most important effects of the adjustment were expected to be:

- Real GDP growth was expected to be reduced by 1 percentage point in 1999.
- Private gross savings over the medium term will increase by app. ½ per cent of GDP, primarily due to the increase in after tax real interest rate. Private financial savings will increase by app. 1 per cent of GDP, thus improving the current account.
- Annual growth rates in house prices were expected to be reduced by app. 3 per cent over the period from 1999-2002.
- Increased effective labour supply due to lower marginal tax rates for low-skilled workers and improved incentives to increase average working hours.

The adjustment of the tax system took effect from January 1999 and will be fully implemented by 2002. Some additional measures were implemented already from July 1998.

Revenue effects of the various changes
The long-term implication of the adjustment was expected to stem primary from structural improvements with respect to private sector financial savings and labour supply. However, in order to stabilise the economic cycle, the adjustment implied a tighter fiscal stance, corresponding to some ½ per cent of GDP.

Table 8. Revenue implications of the 1998-reform package

Bill. DKK. 1998-prices.	1998	1999	2000	2001	2002
Personal taxes[1].....................................	0.0	1.0	-0.1	-2.9	-6.2
Green taxes..	0.6	3.1	3.9	4.8	5.6
Taxes on yield on pension savings.........	0.0	-1.1	-3.7	-3.7	-3.8
Corporate taxes[2]..................................	0.8	1.9	2.0	2.0	1.9
Total	1.4	4.9	2.0	2.0	-2.5
with immediate activity effect[3]	0.6	4.1	3.8	1.9	-0.6
One-time revenue[4]..............................	0.0	0.7	0.8	2.4	3.6

Note: Revenues calculated on the basis of tax rates and tax rules in 1998.
Source: Ministry of Taxation and own calculations.

1) Incl. the switch from taxation of surplus of owner-occupied dwellings to property value tax.
2) Incl. 5 per cent tax on share yields, which creates some revenue in 1998 already
3) Personal taxes, property taxes and green taxes.
4) Associated with tax timing offsets due to changes in depreciation rules and the taxation of Pension savings.

In 1999 a fiscal tightening of DKK 4.1 bill. immediately served to dampen private consumption through higher personal, property and green taxes. By 2002, this tightening has been gradually reduced, as personal income taxation is lowered.

The reform and its macroeconomic context

In 1998, the Danish economy had expanded strongly since 1993. Private consumption was more than 20 per cent higher than in 1993, and the rate of unemployment of 6.5 per cent in 1998 was only about half the 1993 level.

The prolonged recovery in the Danish economy had been viable because of successful labour market reforms, a better educational system and an improved tax system.

Reforms in those areas had enabled unemployment to fall to a much lower level, without inflation picking up, than had been possible in earlier recoveries. Higher inflation or increased current account deficits have often put an end to previous upturns, due to the perceived need for significant tightening of fiscal policy.

The 1998 tax adjustment may thus be viewed as a continuation of reforms already implemented, while at the same time serving to stabilise macroeconomic performance in the short run.

A number of factors contributed to the need for macroeconomic stabilisation. The most important were:

- Long-term interest rates had dropped app. 1 percentage point from the already low level in late 1997 of 5 per cent (10 year government bond). This was partly due to the Asian financial crisis, which reduced interest rates in all OECD-countries, and partly due to a narrowing Danish interest rate differential vis-á-vis Germany.
- Import prices, especially energy prices, had dropped significantly – since autumn 1997 the world price on crude oil had dropped some 25 per cent. Lower import and energy prices created a downward pressure on inflation, which, together with nominal wage increases in the upper end of the OECD-average, boosted household real disposable income.
- Local government expenditures had grown more than expected, so fiscal policy in both 1997 and 1998 had only marginally contributed to damaging economic activity.
- Unemployment had fallen rapidly. Although desirable in itself the speed presented a problem for employment and economic growth in the longer term. A further rapid reduction might have lead to unsustainable upward pressure on wages.

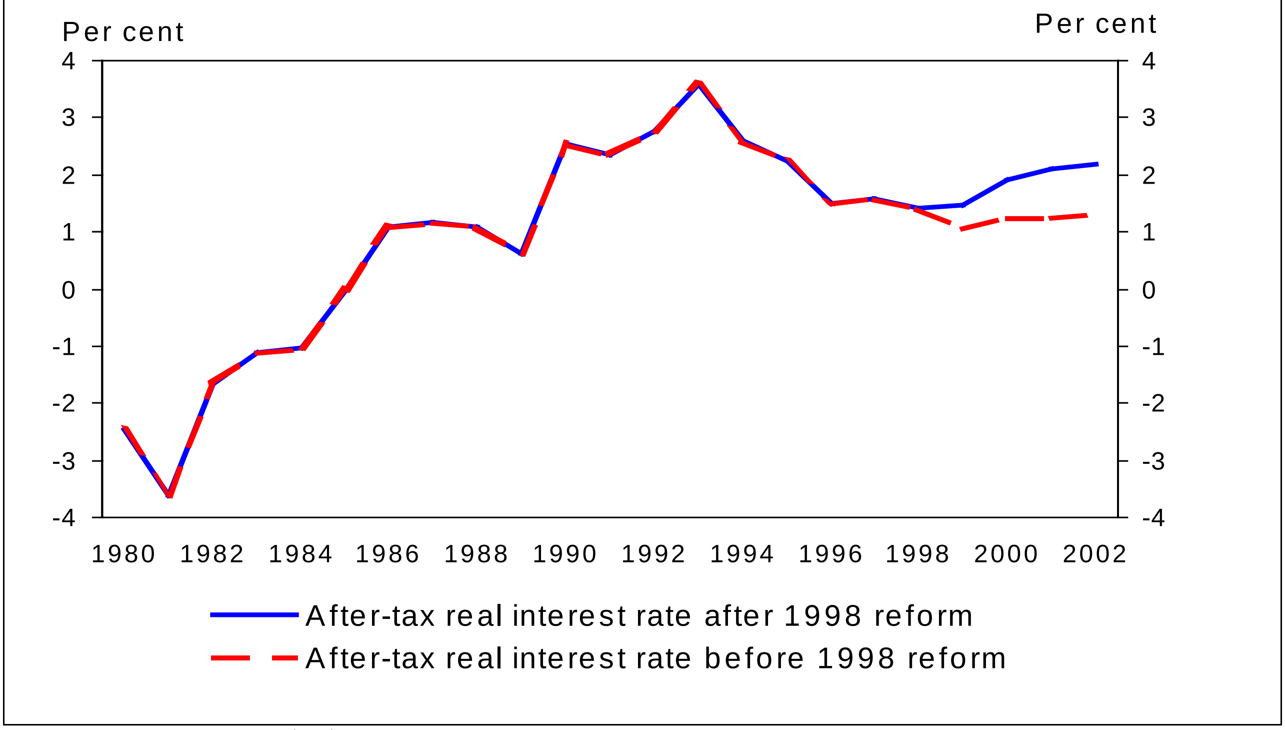
The single most important element of the tax adjustment was the reduction in the tax value of interest deductions by 13 percentage points from previously some 45 per cent to some 33 per cent in 2002.

A lower tax value of interest deductions increased after-tax real interest rates. After a significant increase during the 1980s and early 1990s, after-tax real interest rates for households had steadily decreased since 1993, *cf. figure 4.* The decrease was primarily due to lower nominal interest rates, since inflation had been more or less stable the previous 7-9 years.

A 12 percentage points lower tax value of interest deductions increased household after tax real interest rates by nearly 1 percentage point. This equals between 1/3 and ½ of the reduction since 1993, *cf. figure 4.*

It also appears that the more recent increase is relatively small compared to the large increase throughout the 1980s, which was structurally necessary, but contributed to a long transition period of low growth until 1993.

Figure 4. Household after tax real interest rates before and after the reduction in tax value of interest deductions.



Source: Own calculations.

Working Papers

1/2001. Davidsen, S. og Tuxen Hanus, N. *Analyse af det offentlige forbrug siden 1992*
2/2001. Hauge Jensen, A. *Summary of Danish tax policy 1986-2002*