

## **Danish Tax Reform 2010**

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by  
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## **1. Summary and background**

On 1 March 2009 the Danish government formed a political agreement with Dansk Folkeparti (The Danish Peoples Party) on a tax reform from 2010 – the so called *Forårspakke 2.0*. The legislation was adopted by parliament by the end of May 2009 and will gradually come into force during the years 2010-2019. The reform involves tax cuts and financing of around 30 billion DKK corresponding to around 1.5% of GDP.

The aims of the reform is to increase labour supply in the medium to long term and at same time contribute to soften the effects of the global economic crises in the short run. Furthermore net savings should be increased and goals in the areas of energy, climate, environment and health are supported.

The tax reform is fully financed in the long run but entails a fiscal expansion of a total of around 20 billion DKK during the years 2010-2012.

The tax reform is the latest of a number of tax cuts and tax changes aimed at reducing the marginal income tax rates for all people actively participating on the labour market. Thus the reform should be seen in connection with earlier changes to the personal income tax system like the introduction of the in work tax credit in 2004 and increase in 2008 and the increase of the middle tax threshold in 2004 and 2009.

## **2. Revenue effects of the tax reform**

### **2.1. The Tax Reform**

The overall permanent revenue effect of the 2010 tax reform is neutral when measured before estimated positive structural effects on behaviour. Taxes are cut by 29 billion DKK and financing of a similar amount are introduced. The permanent revenue effects take into account that there is a difference in timing between the different elements in the tax reform and that some tax bases evolve differently during the next decades.

In the first year of reform – 2010 – the tax reform cut taxes by around 29 billion DKK but only increases taxes by around 21 billion DKK. The tax increases implemented to finance the tax reform then grow gradually during the following years.

From 2013 onwards the total reform shows small surpluses. Part of the yearly revenue does however not have any permanent effects on revenue as increased taxation now is matched by reduced taxation in the future.

Finally it is worth noting that within the tax reform the fiscal foundation for a continuation of the tax freeze after 2015 is also created without reducing fiscal sustainability.

Table 2.1 below, summarises the revenue effects from the Danish tax reform 2010.

**Table 2.1. Revenue effects of the Danish tax reform 2010, 1,000 million DKK**

2009-income level	Perma- nent revenue <sup>1)</sup>	Direct revenue effects <sup>2)</sup>						
		2010	2011	2012	2013	2014	2015	2019
1. Reduced middle and top tax	12.6	10.1	11.7	11.7	11.7	11.7	11.7	11.7
- Abolition of 6 % middle tax	6.1	5.8	5.8	5.8	5.8	5.8	5.8	5.8
- Increase of top tax threshold by 56,800 DKK.	5.8	3.9	5.4	5.4	5.4	5.4	5.4	5.4
- Allowance in tax on positive net capital income	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
- Reduction of share income tax	0.4	0.1	0.1	0.2	0.2	0.2	0.2	0.2
- Increase in max. allowed age for withdrawal of capital pension funds by 5 years	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. Reduced bottom tax etc.	14.0	13.7	13.7	13.7	13.7	13.7	13.7	13.7
- Reduction in bottom tax rate	13.8	13.5	13.5	13.5	13.5	13.5	13.5	13.5
- Increased subsidy for child care for single parents	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
3. Green check	1.6	4.6	4.4	4.3	4.1	4.0	3.8	3.3
4. Additional pension	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
<b>Tax reductions in total (1+2+3+4)</b>	<b>29.1</b>	<b>29.3</b>	<b>30.7</b>	<b>30.6</b>	<b>30.4</b>	<b>30.3</b>	<b>30.2</b>	<b>29.6</b>
5. Reduced value of interest deductions	4.5	0.0	0.0	0.3	0.5	0.8	1.0	0.6
- Continued ceiling on tax on owner occupied housing 2016-2019 <sup>3)</sup>	-1.2	0.0	0.0	0.0	0.0	0.0	0.0	-1.4
6. Ceiling on yearly payments to certain pension schemes	0.9	0.1	0.1	0.2	0.3	0.3	0.4	0.7
7. Tax on large pensions	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3
8. Reduced value of assessment deductions	3.1	0.0	0.0	0.3	0.8	1.1	1.6	3.4
9. Increased taxation of fringe benefits	1.1	1.2	1.2	1.2	1.2	1.1	1.1	1.1
10. Green taxes (including health taxes)	6.2	6.6	8.8	8.5	10.0	10.0	9.9	7.1
- Continued nominal freeze of excise duty rates 2016-2019 <sup>3)</sup>	-2.1	0.0	0.0	0.0	0.0	0.0	0.0	-2.6
- Continued indexation of energy taxes from 2016	14.9	0.0	0.0	0.0	0.0	0.0	0.0	2.5
- Financing requirement of energy taxes	-14.9	0.0	0.0	0.0	0.0	0.0	0.0	-2.5
11. Increased taxation of business and industry	4.4	2.3	3.7	3.8	4.4	4.6	4.7	5.1
12. Auctioning of CO <sub>2</sub> -quotas etc.	2.4	0.1	0.1	0.1	3.7	3.7	3.8	4.0
13. Tax planning	1.6	1.2	1.3	1.4	1.4	1.5	1.5	1.6
14. Tax compensation scheme	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.7
15. Abolition of indexation in 2010	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
<b>Financing in total (5+6+7+8+9+10+11+12+13+14+15)</b>	<b>29.1</b>	<b>16.6</b>	<b>20.3</b>	<b>20.8</b>	<b>27.4</b>	<b>28.3</b>	<b>29.0</b>	<b>28.0</b>
<b>Total surplus</b>	<b>0.1</b>	<b>-12.7</b>	<b>-10.5</b>	<b>-9.8</b>	<b>-3.1</b>	<b>-2.0</b>	<b>-1.2</b>	<b>-1.6</b>
<b>Non-recurrent revenue from payments to pension schemes</b>	<b>0.0</b>	<b>4.2</b>	<b>4.3</b>	<b>4.4</b>	<b>4.4</b>	<b>4.4</b>	<b>4.3</b>	<b>3.9</b>
<b>Total surplus after non-recurrent revenue</b>	<b>0.1</b>	<b>-8.5</b>	<b>-6.2</b>	<b>-5.4</b>	<b>1.3</b>	<b>2.4</b>	<b>3.1</b>	<b>2.3</b>
<b>Total surplus after non-recurrent revenue, factor prices</b>	<b>0.0</b>	<b>-6.4</b>	<b>-4.6</b>	<b>-4.1</b>	<b>1.0</b>	<b>1.8</b>	<b>2.4</b>	<b>1.7</b>

1) Excluding behavioural changes. Adjusted for indirect revenue changes from feedback on other taxes etc.

2) Excluding behavioural changes. Not adjusted for indirect revenue changes.

3) Does not require legislation.

Note: The totals may not sum, due to rounding.

## 2.2. Other fiscal measures aimed at the economic crisis

A number of initiatives have been carried out in Denmark, both inside and outside the tax system, in order to counter the global economic crisis. Besides discretionary initiatives, Denmark's high level of automatic stabilizers helps to mitigate the adverse effects of the economic crisis. Among others:

- Postponed payment deadlines for businesses.
- Withdrawal of Special Pension savings (SP).
- Credit package and guarantee scheme.

- Pension agreement.
- Renovation pool.
- Other fiscal measures.

Payment deadlines for taxes and VAT have been deferred for businesses, due to the lack of liquidity in the business sector. This measure gives a liquidity boost of 60 billion DKK. The deadlines for the payment of taxes and VAT will gradually return to the normal rules during the autumn of 2009<sup>1</sup>.

Another initiative launched in order to mitigate the crisis is the disbursement of the SP-savings. More than 90 per cent of the savings will be paid out according to the latest estimates. This means that around 40 billion DKK will be released before tax and around 25 billion DKK after tax<sup>2</sup>.

Two bank packages have been agreed upon, both outside the tax system. The first, a Governmental Guarantee Scheme, which was implemented last fall, entails that loans to the Danish banks are secure. The second package has a fund of up to 100 billion DKK. The Danish banks and mortgage institutions are offered capital injections in the form of hybrid Tier 1 capital if the institutions in question comply with certain demands of solvency. The money can then be lent to businesses and private individuals.

A technical pension agreement is made to ensure that insurance and pension funds aren't forced to sell shares and mortgage credit bonds. Massive sell-offs could have resulted in value depreciation and have led to serious consequences for the solidity of the pension funds.

On the basis of the economic crisis and its impact on craftsmen and the construction industry, a renovation pool has been agreed upon. The renovation pool containing 1.5 billion DKK subsidizes private building projects and is supposed to reduce the increasing unemployment in construction.

Besides the expansive 2009 budget several other measures have been completed to counter the economic crisis; the size of municipal investments has been increased with 2 billion DKK. An agreement has been made on green transportation policy containing measures for 5 billion DKK in 2009 and 2010. Increased regulation and supervision has been implemented in the financial sector. Finally a business package has been announced by the Government.

### **3. Changes to the taxation of personal income**

#### **3.1. Labour income**

##### *3.1.1. A short description of the pre reform tax system*

The Danish personal income tax system is characterised by relatively high tax rates applied at relatively low income levels. Furthermore, there are no real social security contributions of any significance. Hence, income taxes account for almost all revenue from the taxation of labour.

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<sup>1</sup> As part of the adoption of the 2010 Budget the deferred deadlines for personal income taxes and labour market contribution was in December 2009 extended by one year to the end of 2010. The liquidity is increased by around 20 billion DKK,

<sup>2</sup> Following the very large withdrawals of the special pension funds it was decided to abolish this savings scheme.

The main features of the Danish income tax system are listed in table 3.1. Figure 3.1 illustrates the current Danish tax system, with 2009-rates, and shows these main features. In addition to the rates shown in the table a tax ceiling of 59% is in operation. The tax ceiling means that the highest marginal tax rate on labour income including labour market contribution can not exceed around 63%, see box 1 below.

Tax	Rate, %	Base
Labour Market Contribution	8.0	Labour income, fringe benefits, personal income from business activities without any deductions or allowances.
Municipal Tax (average)	24.82	Net value of labour income and social benefits less labour market contribution, pension savings and operating costs plus net capital income less deductible expenses and in work tax credit. There is a personal allowance of 42,900 DKK. The unused part of the personal allowance can be transferred to the spouse.
Church Tax (average)	0.73	
Health Tax	8.0	
Bottom Tax	5.04 (5.26 in 2010)	Net value of labour income and social benefits less labour market contribution, pension savings and operating costs plus positive net capital income. There is a personal allowance of 42,900 DKK. The unused part of the personal allowance can be transferred to the spouse.
Middle Tax	6.0	Net value of labour income and social benefits less labour market contribution, pension savings and operating costs plus positive net capital income. The medium tax only applies to net income above 347,200 DKK and the unused part of the threshold can be transferred to the spouse.
Top Tax	15.0	Net value of labour income and social benefits less labour market contribution, pension savings and operating costs plus positive net capital income and capital pension savings. The top tax only applies to net income above 347,200 DKK and the unused part of the threshold can not be transferred to the spouse.

Bottom tax incl. in work tax credit	$8.0\% + 0.92 \times (24.82 + 0.73 + 8.0 + 5.04)\% - 4.25\% \times 0.3355 =$	42.1
Top and Middle tax (highest marginal tax rate)	$8.0\% + 0.92 \times 59.73\% =$	63.0

### 3.1.2. Changes to the taxation of personal income

The main objective of the tax reform is to reduce marginal taxes on labour income. This is done by reducing the bottom tax rate, abolishing the middle tax and increasing the top tax threshold. The changes are:

- Bottom tax reduced from 5.26 to 3.76%<sup>3</sup>
- Middle tax of 6% abolished
- Top tax threshold increased from 347,200 to 393,400<sup>4</sup> DKK (2009-level)
- Green check of 1,300 DKK for each adult and 300 DKK for children under 18 years (maximum two children). The green check is depending on income and reduced by 7.5% of top tax income base above 348,800 DKK (2009-level)

<sup>3</sup> In December 2009 the bottom tax rate was reduced by additionally 0.09% to 3.67% to compensate for an average increase in municipal taxes of a similar size.

<sup>4</sup> Including a previously agreed increase of 5,000 DKK

- The tax ceiling reduced from 59 to 51.5%

The tax reductions are in part financed by increasing taxation on personal income. These increases include:

- Reduction of tax value of assessment deductions from 35.5 to 25.5%
- Reduced assessment deductions;
  - Ceiling on travel expenses
- Increased taxation of fringe benefits;
  - Multimedia – PC, telephone, broadband
  - Company car
  - Employee shares and bonds
- Tax on large pensions
- Ceiling of 100,000 DKK for payments to pension schemes with less than life-long coverage.
- Abolition of normal wage indexation of thresholds in the tax system from 2009 to 2010.
- Controlling and combating tax planning

In 2010 the bottom tax will be reduced by 1.5%-point and the middle tax will be abolished. At the same time the top tax threshold is increased by 27,700 DKK (2009-level). Also in 2010 the parts of financing that comes from fringe benefits and pensions is entering into force.

In 2011 the top tax threshold is further increased by 18,500 DKK (2009-level).

In 2012 the tax value of assessment deductions (for instance expenses connected to the acquisition of income) and the value of interest deductions (see below) are reduced. The reduction is implemented gradually with 1%-point each year from 2012 to 2019 by reducing the health tax and increasing the bottom tax in parallel. The in work tax credit is also increased in parallel to the reduction in the health tax to maintain its absolute value.

The normal yearly wage indexation of income thresholds and allowances are abolished from 2009 to 2010. This means that the thresholds will be nominally fixed at the same amount as in 2009 except where the thresholds are changed as part of the tax reform. From 2010 the indexation continues.

Finally, various new measures to improve controlling and combat tax planning is taken into use from 2010 and onwards. These measures include amongst others increased use of declarations of income from third parties, changing rules for calculation of interest on tax arrears and restricting the possibilities of changing income assessment.

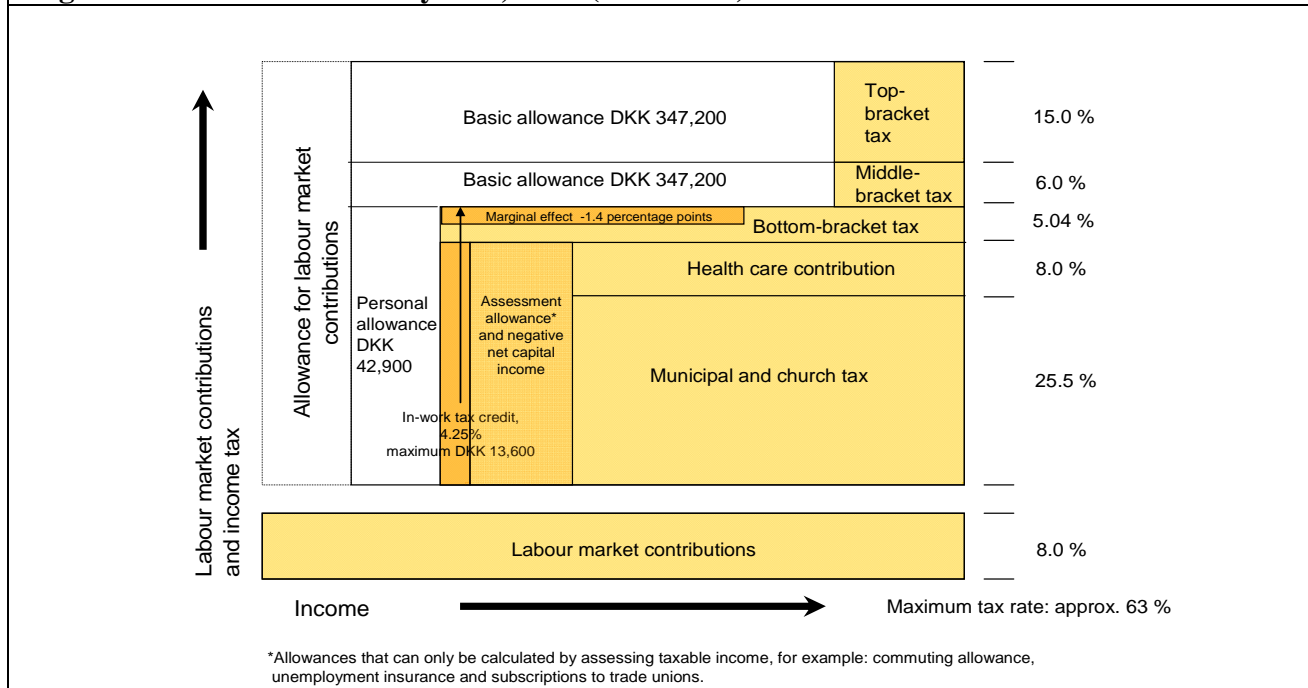
In figure 3.2 the resulting tax system from the reform is shown, with 2019-rates.

<b>Box 2. Calculating marginal tax rates, 2010-19</b>		
Bottom tax incl. in work tax credit	$8.0\% + 0.92 \times (24.82 + 0.73 + 11.76)\% - 5.6\% \times 0.2555 =$	40,9
Top tax (highest marginal tax rate)	$8.0\% + 0.92 \times 52.23\% =$	56,1

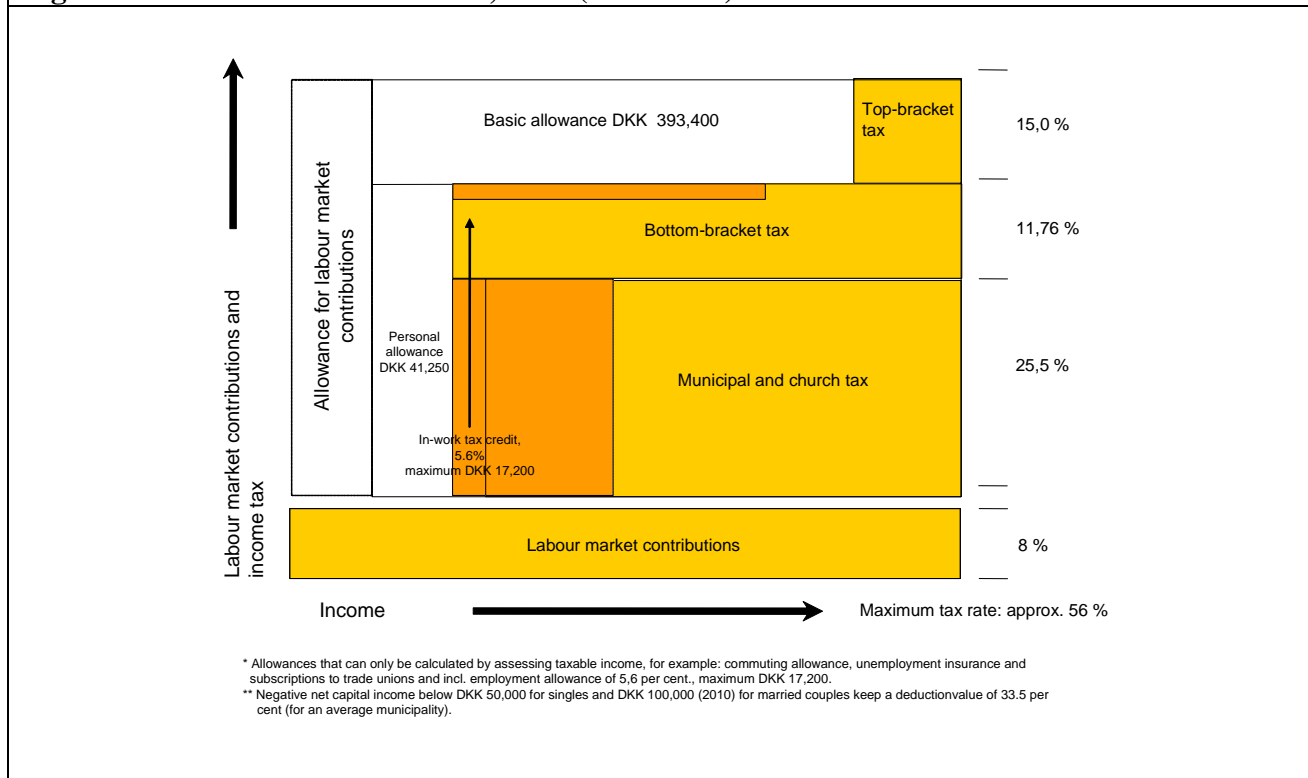
In figure 3.3 the resulting income tax schedule is shown. The marginal tax rates are reduced for all income levels above the personal allowance of around 41,000 DKK. The top marginal tax rate for labour income is reduced from 63.0 to 56.1% and the bottom tax rate (including in work tax credit)

is reduced from 42.3 to 40.9%. For taxpayers with labour income between 379,200 DKK and 398,000 DKK (2009-level) the marginal tax rates are only reduced from 63.0 to 49.2 due to the phasing out of the green check.

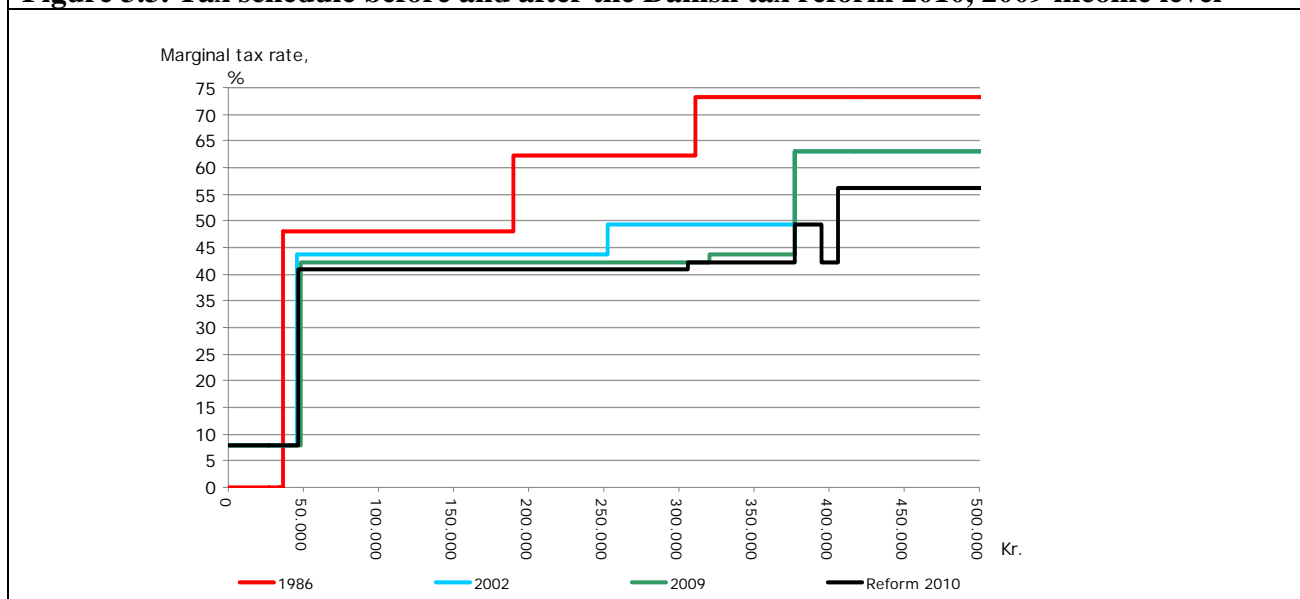
**Figure 3.1. The current tax system, 2009 (2009-level)**



**Figure 3.2. The Danish tax reform, 2019 (2009-level)**



**Figure 3.3. Tax schedule before and after the Danish tax reform 2010, 2009 income level**



### 3.2. Capital income

Danish capital income taxation is characterised by having a relatively wide range of tax rates on different types of capital income. Nominal capital income tax rates vary from 0 to 59.73% in the current tax system.

The tax reform includes the following changes to the capital income taxation:

- Gradual reduction in tax value of net interest payments from 33.5 to 25.5% above 50,000 DKK from 2012-2019.
- Allowance in tax on positive net capital income of 40,000 DKK.
- Reduction in share income tax from 45/43/28 % to 42/27%

In addition there is a tax compensation mechanism that ensures that the loss from the reduced tax value of the deduction of interest payments and assessment deductions can not exceed the gain from lower bottom tax, middle tax, top tax and share income tax.

According to current tax rules negative net capital income – i.e. interest payments typically connected to mortgage payments – is deductible in the base for the municipal, church and health taxes resulting in a tax value of 33.5%. If negative net capital income exceeds 50,000 DKK a year (100,000 DKK for a married couple) the tax value is reduced by 1 percentage point in each of the years 2012 to 2019. At the same time the 50,000 DKK maximum is fixed in nominal terms leading to an increasing proportion of negative net capital income being subject to the lower tax value.

Positive net capital income is part of the base for all the personal income taxes except the labour market contribution. The tax rate is 38.6% (the bottom tax) for income below the top tax threshold of 347,200 DKK and 59.7% above. Positive net capital income occurs when yields from bonds and bank deposits etc. exceed interest payments. From 2010 positive net capital income will be taxed at the new lower rate of personal income tax, however the first 40,000 DKK (80,000 DKK for married couples) of positive net capital income will only be taxed at the new lower bottom tax rate (37.3%) irrespective of the person's total income.



Finally the taxation of share income is slightly reduced. The reduction from 45/43/28 % to 42/27% will maintain the balance between the combined taxation at company and shareholder level<sup>5</sup> and the taxation of labour income. Principal shareholders will thus be (almost) indifferent between pay as labour income or share income (dividends).

## 4. Energy, environment and health

### 4.1. Energy

In total energy taxes will be increased by nearly 4 billion DKK through a number of different measures:

- Increased energy taxation of businesses and households. In general energy taxes – except petrol and diesel – will be increased with around 15% and energy taxes will be levied on business and industry at a rate of 15 DKK per GJ.
- Continued yearly price indexation of energy taxes from 2015.
- Uniform taxation of all heating from combined heat and power production.
- Introduced tax on air conditioning.
- Introduced tax on road lighting.
- Introduced tax on lubricants.
- Reduction of thresholds in CO<sub>2</sub> tax.
- Introduced tax on greenhouse gases.
- Revenue from sale of CO<sub>2</sub> quotas (ETS).

The energy tax system is differentiated between space heating (space heating in businesses and households) and energy used in production processes. The energy taxes are balanced according to the energy content in the different fuels.

The energy taxes on fuels for space heating are increased by 7.5 DKK per GJ and approx 25 DKK per GJ of electricity. This is equivalent to increases of 15%. Businesses (production processes) will no longer obtain a full refund of the energy tax and will, with some exemptions, be levied energy taxes on electricity and fuels at approx 15 DKK per GJ. The energy tax burden levied on businesses will then be approximately  $\frac{1}{4}$  of the energy taxes levied on households, cf. figure 4.1.

Due to cross-border shopping and the overall very high taxation of cars taxes on petrol and diesel are not increased.

The energy taxes on businesses will be fully implemented in 2013, which gives some time to adjust to the increased taxes.

From 2008-2015 the energy taxes are indexed with inflation. The indexation of energy taxes is continued from 2016 and onwards. The revenue of 14.9 billion DKK from this element is used outside of the tax reform to contribute to the overall long run budget balance<sup>6</sup>.

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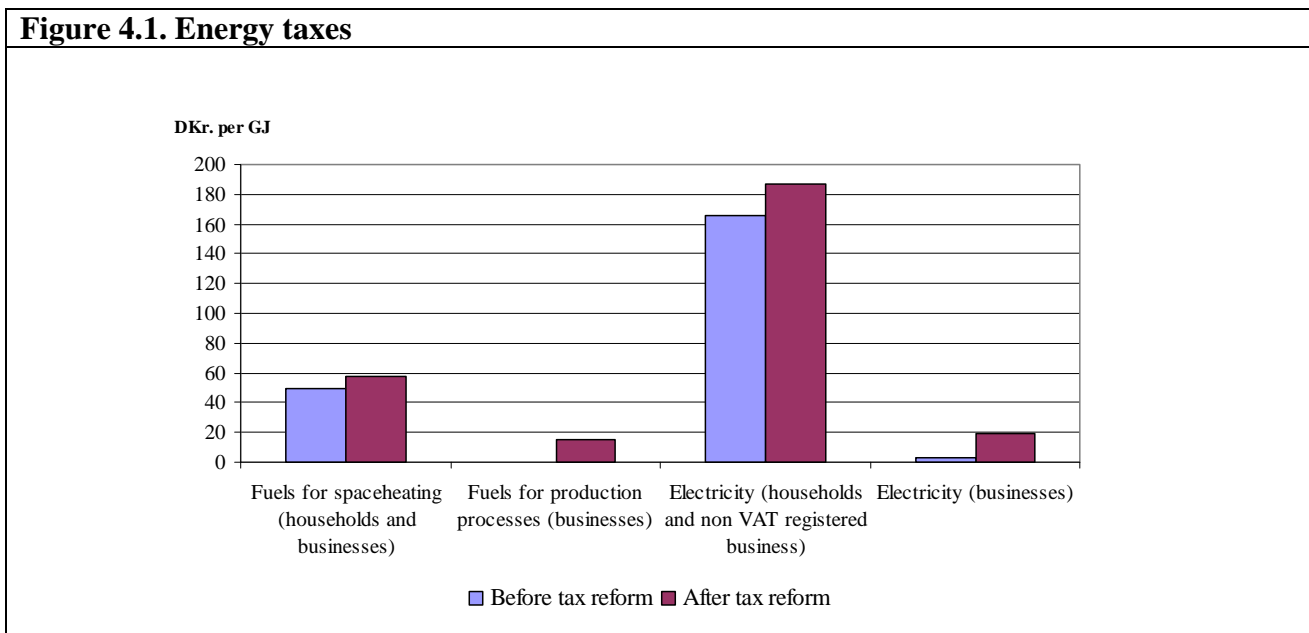
<sup>5</sup> The combined taxation of shareholders are then 25% corporate tax and  $(1-0,25) \times 42\%$  share tax equal to 56.5% in total.

<sup>6</sup> In the calculations of fiscal sustainability it has been a basic assumption that excise duty rates are following the general price increases. Thus, the indexation adopted in the tax reform does not produce any additional fiscal room.

Also a number of tax expenditures and special arrangements are abolished or reduced contributing to the financing of the tax reform; i.e. reduction of thresholds in the CO<sub>2</sub> tax for energy-intensive companies in parallel with the reduction in grandfathering of emission permits, tax on air conditioning, lubricants, uniform taxation of different kinds of CHP etc.

From 2013 allocation of CO<sub>2</sub> emission permits will no longer be free of charge, but the majority of permits will be sold on auctions and other green house gasses than CO<sub>2</sub> are included in the CO<sub>2</sub> tax base. The revenue from the auctioning of the permits will be used to finance the tax reform.

The green check compensates on average households for the increased taxation on energy and environmental related goods as well as the increased health related taxes.



#### 4.2. Environment

As part of the tax reform a number of environment taxes will be introduced or increased. In total the revenue from these taxes are estimated to be 1¾ billion DKK.

- Introduced road pricing for lorries.
- Increased tax on cars without “particle filter”.
- Increased registration tax for taxies.
- Increased tax on company cars.
- Introduced annual tax on vans depending on fuel consumption standards.
- Increased waste water tax by 50%.
- Increased tax on waste.
- Reduced tax on retail packaging.
- Increased tax on CFC gasses.

Besides increased taxation related to energy and CO<sub>2</sub>-emissions, the tax reform also consists of environmentally related taxes. The majority of the environment taxes are related to transportation.

The introduction of road pricing for lorries and tax on vans depending on fuel consumption standards generates the largest share of revenue related to transportation. The initiatives aim to reduce transportation and give an incentive to purchase more energy efficient vans.

The registration tax on a new taxi is low compared to a normal car. This gives a subsidy to the taxi business, as the taxi can be sold at market price after it has been used for two to three years. The registration tax on taxis is increased from 20% to 70% of market price exclusive of taxes and the threshold is increased from 12,100 DKK to 230,000 DKK. This reduces the subsidy for expensive taxis and gives an incentive to purchase less expensive taxis which tend to be correlated with more energy efficient cars.

Diesel cars without particle filters will be subject to an extra yearly tax of 1,000 DKK.

Company cars will be subject to an extra environment tax that is based on the fuel consumption norm. The tax will be 3,000 DKK per year for an average company car.

The waste water tax is balanced after the content of phosphorus and nitrogen in the waste water after cleansing. The environmental tax on waste water is increased with 50% which gives an incentive to discharge less polluted water.

The tax on waste with a content of hydrocarbon used as fuel is increased to the same level as coal, oil etc. and the tax on disposal of waste is increased to keep up with the inflation.

The tax on retail packaging is reduced with 50%. This will reduce an indirect subsidy to businesses that clean and export empty bottles etc. as tax on retail packaging is refunded when exported.

#### **4.3. Health**

Health related taxes contribute to the tax reform with 2¾ billion DKK.

- Increased taxation of tobacco by 3 DKK per 20 cigarettes.
- Increased taxation of ice cream, chocolate and candy by 25%.
- Tax on soft drinks differentiated with respect to sugar.
- Tax on saturated fats in oils and certain dairy products.

To reduce the prevalence of a broad range of illnesses and improve life expectancy excise duties are increased/introduced on tobacco and unhealthy foodstuff. Taxes on health related goods have to be balanced with respect to cross-border shopping. Too high levels of taxes will not reduce the total consumption of unhealthy goods, but only lead to increased cross-border shopping.

The tax on tobacco is increased corresponding to 3 DKK for a package of cigarettes. The tax on pipe tobacco is increased with 120 DKK per kilogram.

The tax on chocolate and candy is increased with 4.5 DKK per kilogram and tax on ice-cream is increased with 1 DKK per litre.

To reduce sugar consumption from soft drinks, the tax is differentiated. The tax on soft drinks with sugar content increases with 0.34 DKK per litre and sugar free soft drinks is reduced with 0.17 DKK per litre.

A new tax on saturated fat is to be introduced. It is the aim to raise revenue of around 1 billion DKK yearly. The base for this new tax will probably be dairy products (with a fat content above what is normal in drinking milk), margarine, oil (olive-, rapeseed-, sunflower-oil etc.) and animal fats. The tax rate is still to be fixed, but will most likely be around 15 to 20 DKK per kilogram saturated fat.

## **5. Business and industry**

### **5.1. Corporate taxation**

Changes in corporate taxation contribute to the tax reform with app. 3 billion DKK.

- Harmonisation of companies' taxation of income from shares.
- Elimination of deductions for attorney and accountant costs associated with the establishment of businesses.
- Elimination of deductibility for interest on the purchase of foreign shares.
- Recaptured depreciations.
- Tightening of rollover relief for real estate.
- One-off increase in the tonnage tax.
- Increased tax on labour costs in the financial sector.
- Elimination of cost reimbursements for companies in connection with tax matters.
- Nominal freeze of subsidies for the business sector.

Fewer exemptions and special arrangements for businesses are used to finance the abolition of the middle tax and the decrease in the top tax base. It is important to notice that even though the Danish businesses are financing some of the tax cuts, they might also gain from the lower marginal taxes.

The tax reform is used to harmonise the rules of companies' taxation of income from shares. This simplification of the rules contains among other things; tax-free yields and gains from subsidiary and allied company shares, regardless of time of ownership. On the contrary there will be full taxation on yields and gains from other shareholdings (portfolio shares), regardless of time of ownership.

In order to prevent distortion of competition, it is agreed upon to remove the possibility to deduct attorney and accountant costs associated with establishing a business. This is more in accordance with the general principle, that no deduction is possible for expenses regarding establishment of new businesses and only operating costs are deductible.

Deductibility of interest on the purchase of foreign shares is removed, since it is often the case that the right to deduct the interest expense is given even though a taxable income may never occur in Denmark later on.

In the current framework individuals only take 90% of recaptured depreciations on buildings into account when stating taxable income. The tax rebate of 10% has now been eliminated.

In order to ensure a more uniform treatment of different industries it is agreed upon to tighten rollover relief for real estate, hence rollover isn't possible anymore in rented farm properties and the like. Furthermore after the reform rollover is only possible inside the EU and EEA.

The rate for payment of tax on labour costs in the financial sector is increased from 9.13% of the wage costs to 10.5% Due to the financial and economic crisis the increase will not be effective until 2013.

In order to reduce complaints and induce administrative advantages, it is agreed upon to eliminate cost reimbursements for companies in connection with certain tax matters. At the same time the costs will be deductible.

A range of subsidy schemes, not covered by binding political agreements, is maintained in nominal value from 2010 to 2015.

## **5.2. VAT**

Changes in VAT rules on exemptions for certain activities contribute to the tax reform by approximately 1½ billion DKK.

- Removed exemption on travel agencies.
- Removed exemption on property management.
- Removed exemption on the supply of buildings and building land.

To prevent distortion of competition, VAT exemption has been removed on certain activities. This has led to a broadening of the tax base. At the same time the removal of the exemptions has contributed to more harmonized rules within the EU.

A large part of the travel agencies are already subject to VAT. The exemption only covered companies, who in their own name delivered services directly to the traveller, but where these services were carried out by other companies. The removal of this exemption will therefore create more uniform rules.

The removal of exemption on the supply of buildings and building land and on property management is also agreed upon to ensure more uniform rules.

Finally, the revenue from the implementation of changes to the VAT legislation according to the EU VAT directive on the place of supply of services is used for financing the tax reform.

## **6. Effects on income distribution – microsimulations**

### **6.1. Static one year effects**

Distributional effects plays an important role in Danish tax policy. To achieve a well balanced tax reform a large part of the tax reductions are granted as general tax cuts and changes that increase disposable income for lower income groups. This ensures that all income deciles face an increase in disposable income. Furthermore a number of elements contributing to the financing of the reform are targeted groups with relative high income. This gives a more equal distributional profile.

The tables shown here include effects of changes in personal income taxation and excise duties. Elements like changes in corporate taxation and excise duties on i.e. business use of energy as well as behavioural effects are not included in the distributional effects. The estimated distributional effects are based on the same assumptions as the distributional effects presented in the spring 2009.

The immediate distributional effects on the current population at their current income levels are shown in table 6.1 for equivalent income (income adjusted by family size). The first 6 deciles with the lowest income receives tax reductions of 1.2 – 1.4% of disposable income on average. Across the last 4 deciles with the highest income levels relative tax reductions are increasing due to the reduction in the highest marginal tax rate. The 10% with the highest income receive tax reductions of 3.9% of disposable income.

**Table 6.1. Distributional effects of final reform on income deciles (2019-rules in 2009 income level).**

Deciles	Number of taxpayers	Average change in disposable income			Relative change in disposable income		
		Tax changes	Other reform elements	Total change	Tax changes	Other reform elements	Total change
	(1,000)	DKK	DKK	DKK	%	%	%
1	545	1,170	-100	1,070	1.4	-0.1	1.3
2	545	1,510	300	1,810	1.2	0.2	1.4
3	545	1,770	140	1,910	1.2	0.1	1.3
4	545	2,140	-90	2,050	1.3	-0.1	1.2
5	545	2,620	-270	2,350	1.4	-0.1	1.3
6	545	3,180	-350	2,830	1.6	-0.2	1.4
7	545	4,060	-500	3,560	1.8	-0.2	1.6
8	545	5,660	-700	4,960	2.3	-0.3	2.0
9	545	7,910	-870	7,050	2.8	-0.3	2.5
10	545	19,190	-2,890	16,300	4.6	-0.7	3.9
All	5,450	4,920	-530	4,390	2.4	-0.3	2.1

Note: The table shows changes in taxes and excise duties measures according to the equivalent income of the taxpayers. This means that income and taxes are adjusted by number of individuals in the taxpayer's household.

Looking at socioeconomic groups (table 6.2) the picture remains the same. All groups receive tax reductions between 1.3 and 3.1%. The tax reductions are – as intended – highest for people active on the labour market. However, also taxpayers above 66 years (pensioners) receive tax reductions above 2.1% mainly because they on average contribute less to the financing of the reform. For instance this group is less burdened by the reduction in the tax value of interest payments and deductible expenses.

**Table 6.2. Distributional effects of final reform on socioeconomic groups (2019-rules in 2009 income level).**

Socioeconomic group	Number of taxpayers (1,000)	Average change in disposable income			Relative change in disposable income		
		Tax changes	Other re-form elements	Total change	Tax changes	Other re-form elements	Total change
		DKK	DKK	DKK	%	%	%
Fully employed	1,760	6,850	-1,040	5,810	2.7	-0.4	2.3
Self-employed	175	7,790	-990	6,800	3.5	-0.5	3.1
Part time employed	180	5,490	-800	4,690	2.5	-0.4	2.1
Part year employed	325	3,380	-400	2,980	1.8	-0.2	1.6
Fully unemployed	170	2,050	-290	1,760	1.5	-0.2	1.3
During education	335	3,100	-470	2,630	2.1	-0.3	1.8
Job release	245	2,720	140	2,860	1.5	0.1	1.6
Early retirement	140	3,620	-160	3,460	1.7	-0.1	1.6
Above 66 years	755	3,080	630	3,710	1.8	0.4	2.1
All taxpayers	5,445	4,920	-530	4,390	2.4	-0.3	2.1

Note: Equivalent income measures see table above. The groups "children" and "other 18-66 years" are included in "all taxpayers".

When the tax reform reaches its final stage in 2019 tax reductions will be smaller than in the short run. This is mainly due to the gradual reductions in the value of interest deductions and deductible expenses. In table 6.3 the difference in the tax reductions are shown. The initial fiscal expansion is part of the government response to the current international economic crisis.

In the longer run the part of the financing of the tax reform that initially falls on business will be shifted from capital to labour as capital adjusts to the new increased level of taxation in certain sectors.

**Table 6.3. Distributional effects in 2011 and of the final reform on socioeconomic groups (2009 income level).**

Socioeconomic group	Average tax according to old rules	2011		Final reform	
		Average change in tax	Change in tax as % of disposable income	Average change in tax	Change in tax as % of disposable income
	DKK	DKK	%	DKK	%
Fully employed	144,060	8,990	3.6	6,850	2.7
Self-employed	109,260	9,360	4.2	7,790	3.5
Part time employed	86,520	7,130	3.2	5,490	2.5
Part year employed	69,360	4,890	2.6	3,380	1.8
Fully unemployed	35,020	2,960	2.1	2,050	1.5
During education	27,360	4,080	2.7	3,100	2.1
Job release	42,650	3,400	1.9	2,720	1.5
Early retirement	57,060	4,720	2.2	3,620	1.7
Over 66 years	51,690	3,490	2.0	3,080	1.8
All taxpayers	72,340	6,400	3.1	4,920	2.4

Note: Equivalent income measures see table above. The groups "children" and "other 18-66 years" are included in "all taxpayers".

The tables 6.1-6.3 show the average tax changes for large groups. There is however some variation within the groups and even though all deciles and socioeconomic groups gain from the reform on average there are still a limited number of families who will be worse off in the short run.

In table 6.4 the variation in size of tax changes are shown. On average all families will gain around 7,000 DKK when the final reform is fully implemented in 2019. But around 1,000 families will loose around 5,600 DKK while on the other hand 840,000 families will gain more than 17,000 DKK on average.

**Table 6.4. Families distributed according to the size of change in tax in 2011 and the final reform (2009 income level)**

Tax change	2011			Final reform		
	Number of families		Average change	Number of families		Average change
DKK	(1,000)	%	DKK	(1,000)	%	DKK
Tax increase above: 100	1	0.1	- 4,770	1	0.0	- 5,570
Change from: -100 – 100	2	0.1	0	3	0.1	0
Tax reduction: 101 – 500	0	0.0	220	1	0.0	360
501 – 1,000	0	0.0	710	195	7.2	900
1,001 – 2,500	623	23.1	1,840	900	33.5	1,800
2,501 – 5,000	805	29.8	3,660	755	28.0	3,530
Over 5,000	1,265	46.9	16,180	840	31.2	17,200
<b>All families</b>	<b>2,695</b>	<b>100.0</b>	<b>9,100</b>	<b>2,695</b>	<b>100.0</b>	<b>7,010</b>

Note: Actual non-equivalent income.

The distributional effects of the tax reform can also be calculated for different family types similar to the OECD Taxing Wages approach but with assumptions of income and deductions on a wider variety of parameters. Again the overall picture is the same. All family types gain from the reform and as intended families with labour market participation gain more than other families.

**Table 6.5. Effect of tax reform on different family types, 2011-regler (2009 income level)**

	Change in disposable income	
	DKK	% of income <sup>1)</sup>
A. Single parent, 1 child, tenant. Wage income 250,000 DKK	5,190	2.1
B. Single parent, 1 child, tenant. Wage income 350,000 DKK	6,410	1.8
C. Married couple, 2 children, tenants. Wage income 500,000 DKK	4,640	0.9
D. Married couple, 2 children, tenants. Wage income 600,000 DKK	5,900	1.0
E. Married couple, 2 children, owner occupancy. Wage income 600,000 DKK	5,900	1.0
F. Married couple, 2 children, owner occupancy (large interest payments). Wage income 624,890 DKK	5,920	0.9
G. Married couple, 2 children, owner occupancy. Wage income 700,000 DKK	6,510	0.9
H. Married couple, 2 children, owner occupancy. Wage income 800,000 DKK	12,750	1.6
I. Married couple, 2 children, owner occupancy. Wage income 1,100,000 DKK	38,880	3.5
J. Single pensioner without supplementary income, tenant.	1,790	1.3
K. Pensioner couple, 1 Labour market supplementary pension scheme, owner occupancy.	4,060	1.8
L. Pensioner couple, 1 Labour market supplementary pension scheme, tenants	3,030	1.3
M. Single unemployment benefit, tenant	1,230	0.7

1) In % of wage income, pensions other taxable income transfers.

## 6.2. Distributional effects – expected remaining life

The distributional analysis presented above suffers from especially one serious drawback. It does not take into consideration the natural and inevitable mobility of families and individuals during people's life time.

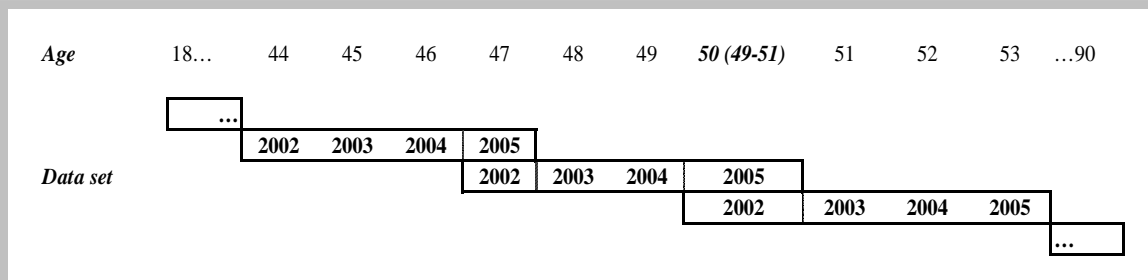


With the purpose of analysing the effects of the tax reform on a wider span of years than just one year it is instead appropriate to look at the existing population for instance during their expected remaining life.

### Box 6.1. Calculations of expected remaining life income

A sample of the Danish population with information on income, taxes and personal characteristics (lovmodellen) following each person in 4 years from 2002-2005, is the foundation for the calculation.

The model for remaining life income takes its starting point in persons aged 49-51 in 2005. The fundamental principle is that in 2005 each person's life is "prolonged" using the sample for the 4-year period 2002-2005. The model constructs life time income data for these persons by a statistical match of similar persons in 2005 and 2002.



The matching is conducted on a vector of characteristics other than income: Gender; number of adults; number of children; type of housing; education; capital income.

For example, the continuation of a 40-year-olds course of life in 2005 would be done by finding a 40-year-old in 2002 with similar characteristics, and then again match this individual aged 43 in 2005 with a similar 43 year old in 2002, etc.

Correction for inflation and growth is incorporated in the model and continuation of a life is terminated either when the person is 18 years old or when that person dies, emigrates or turns 90-years-old.

Looking at the effects for the remaining life it becomes clear that one year effects exaggerate the redistribution effects of a reduction in the progression of the tax system.

For all groups there is a tax reduction of 2.1-2.9% of disposable income. Compared to the one year effects the distributional effects are now more balanced and the variation between the different groups is smaller.

The 10% of the population with the lowest income in the first year of the reform will receive an average increase in disposable income of 2.3% during their remaining life. This is considerably more than the one year effect of 1.3% and is due to the normal income mobility over a life span.

The 10% of the population with the highest income during the first year of the reform will on the other hand receive an increase in disposable income of 2.9% during their remaining life. This is on the other hand considerably less than the one year effect of 3.9%.

The differences in one year and remaining life effects are compared in figure 6.1.a.

**Table 6.6. Distributional effects of final reform on income deciles – remaining life (2019-rules).**

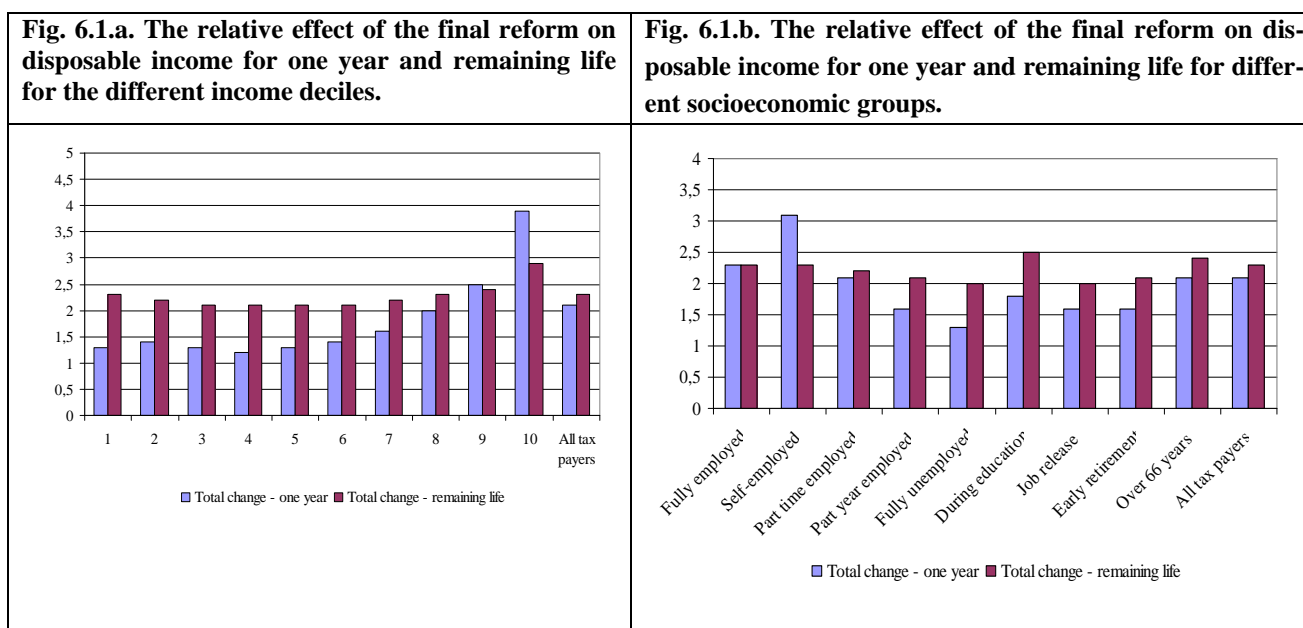
Deciles	Relative change in disposable income		
	Tax changes	Other reform elements	Total change
	%	%	%
1.	2.6	-0.3	2.3
2.	2.2	0.0	2.2
3.	2.2	-0.1	2.1
4.	2.3	-0.2	2.1
5.	2.4	-0.3	2.1
6.	2.5	-0.4	2.1
7.	2.6	-0.4	2.2
8.	2.7	-0.4	2.3
9.	2.8	-0.4	2.4
10.	3.5	-0.6	2.9
All taxpayers	2.6	-0.3	2.3

The same picture shows when looking at effects on different socioeconomic groups in their remaining life. Here groups with less than full employment in the first year of reform will gain more from the reform when taking a remaining life perspective. It is especially worth noting the obvious result that people during education in the first year of reform face the largest increase in disposable income. This is due to the reduction in marginal tax rates.

**Table 6.7. Distributional effects of the final reform on socioeconomic groups – remaining life (2009 income level).**

Socioeconomic group	Relative change in disposable income		
	Tax changes	Other reform elements	Total change
	%	%	%
Fully employed	2.8	-0.5	2.3
Self-employed	2.8	-0.5	2.3
Part time employed	2.7	-0.5	2.2
Part year employed	2.5	-0.4	2.1
Fully unemployed	2.3	-0.3	2.0
During education	3.0	-0.5	2.5
Job release	2.1	-0.1	2.0
Early retirement	2.1	0.0	2.1
Over 66 years	2.2	0.2	2.4
All taxpayers	2.6	-0.3	2.3

In figure 6.1.b the one year and remaining life effects on different socioeconomic groups are compared.



## 7. Effects on business and industry

Overall the Danish tax reform 2010 produces an immediate burden on Danish businesses of just above 10 billion DKK. This corresponds to 0.7% of the gross value added and 1.1% of the compensation of employees. The burden must be seen together with the fact that it is used to finance the reduction in income taxes. The financing contribution mainly comes from fewer exemptions and special arrangements for businesses.

As seen in table 7.1 the burden varies with the different industries. Measured against the gross value added the burden varies between 0.3% and 1.8%. The burden is smallest in the primary industries (“agriculture, fishing and quarrying”) and “public and personal services” and largest in “electricity, gas and water supply”.

The burden of the individual sub industries also varies. Within manufacturing for example the industry with the largest burden is “manufacturing of food products, beverages and tobacco”, with a burden of 2% of gross value added and 3% of compensation of employees. The manufacturing industry with the smallest burden is “manufacturing of basic metals and fabrication of metal products”, with a burden of 0.6% of gross value added and 0.8% of compensation for employees. Hence the overall burden can cover up a considerable dispersion within the individual industries.

**Table 7.1. Immediate burden on businesses of the Danish tax reform 2010**

Industrial classification code	Billion DKK 2009-level	Per cent of gross value added	Per cent of compensation of employees
<b>Total</b>	<b>10.5</b>	<b>0.7</b>	<b>1.1</b>
<b>1. Agriculture, fishing and quarrying</b>	<b>0.2</b>	<b>0.3</b>	<b>1.6</b>
0109 Agriculture, horticulture and forestry	0.1	0.6	0.9
0500 Fishing	0.0	0.2	0.4
1009 Mining and quarrying	0.1	0.2	4.8
<b>2. Manufacturing</b>	<b>2.4</b>	<b>1.1</b>	<b>1.5</b>
1509 Mfr. of food products, beverages and tobacco	0.8	2.0	3.0
1709 Mfr. of textiles and leather products	0.0	1.5	1.8
2009 Mfr. of wood-, paper products; printing and publish.	0.2	0.9	1.2
2309 Mfr. of chemicals and plastic products	0.5	1.4	2.2
2600 Mfr. of other non-metallic mineral products	0.2	1.4	2.4
2709 Mfr. of basic metals and fabr. metal prod.	0.6	0.6	0.8
3600 Mfr. of furniture; manufacturing n.e.c	0.1	0.8	1.2
<b>3. Electricity, gas and water supply</b>	<b>0.5</b>	<b>1.8</b>	<b>6.7</b>
<b>4. Construction</b>	<b>1.1</b>	<b>1.2</b>	<b>1.7</b>
<b>5. Ws. and retail trade; hotels; restaurants</b>	<b>1.0</b>	<b>0.5</b>	<b>0.7</b>
5000 Sale and repair of motor vehicles; sale of auto. fuel	0.1	0.4	0.6
5100 Wholesale except of motor vehicles	0.7	0.7	0.9
5200 Re. trade and repair work exc. of motor vehicles	0.2	0.3	0.4
5500 Hotels and restaurants	0.1	0.5	0.7
<b>6. Transport, post and telecommunications</b>	<b>0.5</b>	<b>0.4</b>	<b>0.8</b>
6009 Transport	0.4	0.5	0.8
6400 Post and telecommunications	0.1	0.3	0.5
<b>7. Finance and business activities</b>	<b>2.7</b>	<b>0.7</b>	<b>1.5</b>
6509 Finance and insurance	0.8	0.9	1.7
7009 Letting and sale of real estate	0.6	0.4	3.8
7209 Business activities	1.2	0.9	1.1
<b>8. Public and personal services</b>	<b>1.2</b>	<b>0.3</b>	<b>0.3</b>
7500 Public administration	0.3	0.3	0.4
8000 Education	0.2	0.3	0.3
8519 Human health activities	0.2	0.3	0.3
8539 Social institutions etc.	0.2	0.2	0.2
9009 Associations, culture and refuse disposal	0.3	0.4	0.6

Note: The distribution on industries is made with an element of estimation. The gradual transition to the sale of CO<sub>2</sub>-quotas from 2013 is not included; this is estimated to bring in revenue from the business world of approx. 2.3 billion DKK. Furthermore approx. 0.9 billion DKK of the overall burden hasn't been possible to allocate on individual sectors and it has in all cases been possible to allocate the burden of a sector to sub sectors.

The influence from the tax reform on the competitiveness for Danish businesses does not only depend on the changes made in the taxes and duties directly related to the businesses, but also on additional elements, related to factors of production.

The competitiveness of businesses in export-and import-competing industries will be most affected by the direct burden on businesses, whereas the domestic businesses will be less hit. The effect will among other things depend on the possibility to pass on the increased taxes to wages et cetera.

The direct business burden should anyhow be viewed against the fact, that in the long term the reduction in personal taxes is expected to give a positive contribution to productivity, and thereby to the competitiveness.

Finally, the direct business burden must be seen in proportion to the green objectives achieved by the tax reform. In the case of a lower burden on businesses, the green objectives would have to be realised otherwise and thereby still cause a burden.

## 8. Effects on behaviour

### 8.1. Labour supply, education and work effort

The main objective of the Danish tax reform 2010 is to increase labour supply and thereby contribute to fiscal sustainability in the medium to long term. The tax reform is fully financed measured before any effects on labour supply. Hence, positive effects on labour supply will improve fiscal sustainability.

Labour supply will increase if the return to labour is increased. It is important to notice that direct labour income taxes and excise duties as well as taxes levied on the business sector should be included when estimating the labour supply effects.

The effects of the change in labour taxation is an increase in after tax return to labour of 2% for taxpayers paying bottom tax only and 19% for taxpayers paying the highest marginal tax. For taxpayers who paid the highest marginal tax before the reform and due to the increase in the threshold only pay the bottom tax after the reform the increase in after tax return to labour is 56%. For taxpayers who paid the highest marginal tax rate before the reform and after the reform pay bottom tax and are in the income bracket where the green check are phased out the increase in after tax return to labour is 37%.

**Table 8.1. Taxable individuals and their difference in marginal taxes**

	2008		2009		2010		2011	
	Number, %	Tax rate	Number, %	Tax rate	Number, %	Tax rate	Number, %	Tax rate
Taxable individuals, persons	4,655	-	4,675	-	4,675	-	4,675	-
Bottom-, health- and municipal tax	58	42.6	68	42.1	73	40.9	76	40.9
Middle tax, but not top tax	8	49.4	-	-	-	-	-	-
Top tax, but not middle tax	2	57.7	6	57.3	14	56.1	12	56.1
Top tax and middle tax	19	63.0	13	62.8	-	-	-	-

In table 8.2 the estimated effects are shown. The major part of the total effect comes from reductions in the highest marginal tax rate and the number of taxpayers liable to the highest marginal tax rate. These two elements contribute by around 20,000 full time employed. It is worth noting that this effect is reached spending only 12,000 million DKK out of a total of tax reduction of 29,000 million DKK.

Reducing the bottom tax rate also contribute to an increase in labour supply of an estimated 4,900 full time employed. A reduction in the bottom tax rate affects all taxpayers – both on and outside the labour market. Around 14,000 million DKK is spent on the reduction of the bottom tax rate.

<b>Reform element</b>	<b>Change in full time employment</b>
Abolition of middle tax	10,800
Increased top tax threshold	9,400
Reduced bottom tax	4,900
Financing elements and green check etc.	-5,800
<b>Total labour supply effect</b>	<b>19,300</b>

The increased labour supply is especially attributable to the employed working more hours or that the average working hours decreases less than otherwise.

The rest of the elements in the tax reform also have labour supply effects to the extent that they affect the (relative) return to labour. It is estimated that the total effect is a reduction in labour supply of 5,800 full time employed. These effects include amongst others excise duties levied directly on households and on inputs in business and industry, corporate and business taxation and capital taxation.

In order to estimate the effects in table 8.2 a number of assumptions are needed.		
The elasticities are set according to a study made by <i>Frederiksen et al (2001)</i> . The study only focused on quantitative effects expressed as changes in working hours. Elasticities are higher for women, decreasing in marginal wages and increasing in virtual income.		
The elasticities of labour supply are transformed into a gender specific labour supply function for each individual.		
Table 8.3 shows the labour supply functions and associated elasticities. Utilising information on working hours, marginal hourly wages and virtual income, the average elasticity can be calculated using these equations. The average elasticity of substitution is calculated as 0.1, hence a 1 per cent increase in after tax wages increases average working hours by 0.1 per cent.		
<b>Table 8.3. Labour supply functions and elasticities</b>		
	<b>Men</b>	<b>Women</b>
Annual labour supply (h)	$17*\ln(w)-0.01*(Y/w)+X*b$	$49*\ln(w)-0.04*(Y/w)+X*b$
Elasticity of substitution	$17*(1/h)+0.01*(1+Y/w*h)$	$49*(1/h)+0.04*(1+Y/w*h)$
Income elasticity	$-0.01*(Y/w*h)$	$-0.04*(Y/w*h)$
Source: "Fordeling og incitament 2002", Ministry of Finance, Denmark		
Explanation:		
h – annual working hours		
w – marginal hourly wage after taxes (consumption taxes not included)		
Y – virtual income ("other income" after taxes, when a segmented budget constraint is assumed)		
X – personal characteristics		
The individual elasticities depend on gender, after-tax marginal wages, virtual income and number of working hours.		
The changes in labour supply caused by the reform is calculated as the difference in annual labour supply with tax code before and after the reform incorporated into w and Y.		

According to the Danish Rational Economic Agents Model (DREAM), the effect on labour supply as a consequence of the reform elements in table 8.2 will be 14,300 extra individuals<sup>7</sup> on the labour

<sup>7</sup> Measured as labour supply with average productivity.

market. DREAM makes more generalising calculations and assumptions, and the results are therefore not equal, but the DREAM results are in accordance with the estimates presented in table 8.2.

## 8.2. Savings and investments

In the Danish tax system, the yield from households' savings is taxed with different rates, depending on whether the yield comes from bank balances, stock of bonds, shares, owner-occupied housing or pension schemes. This asymmetrical taxation can cause a distortion. The savings will then be placed where it is most beneficial for individuals (where the after tax-return is highest) and not necessarily for society. Furthermore, the nominal tax rates are rather high, taking into account that a part of the nominal return is not a real income but only compensates for inflation.

As is seen in table 8.4 the effective marginal tax rates on capital income continues to be high after the tax reform, but there are still some improvements. The spread between negative and positive net capital income is left almost unchanged but nominal tax rates have been reduced and the total variation between the taxation of different investments are reduced.

**Table 8.4. Tax rates on capital income and the Danish tax reform 2010**

<i>Highest nominal tax rates</i>	Before	After
Negative net capital income	33.5	25.5
Positive net capital income	59.7	52.2
Share income	45.0	42.0
Pension	15.0	15.0

The lower and more uniform effective tax rates on capital income affect both the level of savings and the allocation of wealth for the households.

The lower overall effective tax rates means that the price on consumption in the future relative to consumption today decreases. This causes an increase in savings and an increase in the stock of wealth and future consumption.

The more uniform effective tax rates improve the incentives to place savings where before tax-return is highest, not where effective tax-rates are lowest. This causes a more efficient allocation of wealth.

In table 8.5 the revenue effects of changes in savings behaviour expected from the tax reform is shown. The overall changes in savings behaviour are estimated to contribute by an increase in fiscal sustainability of 1.6 billion DKK.

The increased savings attributable to the lower overall effective tax rates contribute with 1.15 billion DKK and 0.7 billion DKK is attributable to the portfolio changes from more uniform tax rates.

**Table 8.5. Revenue effects of the tax reform from changes in saving behaviour**

	-----Million DKK -----			Total
	Positive net capital income	Share income	Negative net capital income	
Increased savings	300	0	850	1,150
Portfolio	650	50	0	700
Total	950	50	850	1,850
Total with phase-in	950	50	600	1,600

### Box 8.2. Model description

In order to review the revenue effects on savings two models were set up. One model considers the portfolio changes and one model considers the level of saving.

#### *Revenue effects of portfolio changes:*

The model considering portfolio changes is a partial model. The model is set for two representative agents; one agent represents individuals with negative net capital income, and one represents individuals with positive net capital income. The overall wealth for households is allocated between the two agents, on the basis of information from a sample of the Danish population with information on income, taxes and other characteristics (lovmodellen).

The combination of gross savings is determined by the disutility of a so-called CES aggregate of free savings and pension savings. The free savings is then again a CES aggregate of shares, which are taxes as share income and assets which are taxes as capital income. The so-called elasticity of substitution between free savings and pension savings is set to be 1.05. The elasticity of substitution between shares and bonds in free funds is set to be 4.

The distribution of the financial net wealth between respectively passives and gross savings is determined by the ratio between after tax costs when borrowing and after tax payment of interest of gross savings.

#### *Revenue effects of changes in the level of savings:*

In order to review the effects of lower overall effective tax rates on capital income, a theoretical model is made. The model has overlapping generations as developed by *Blanchard/Yaari/Weil (BYW)*. All individuals in this model have a death frequency independent of age. This means that it is possible to aggregate individual consumption functions into one macro consumption function. This simplifies the model analytically. Consumption constitutes a fixed proportion of the current wealth and the value of future income.

The parameters of the model are calibrated, so that the actual conditions of the Danish economy in the starting point is recreated. The sensitivity of savings is determined so that when real return after tax of financial savings increases with 1 percentage point, then short term savings will increase by 0.9 per cent of GDP. The propensity to consume increasing wealth is initially determined to be beneath 3 per cent.

In DREAM it is estimated that the household sector will increase its free savings by 226 billion DKK (2009-level) in the long run.

### 8.3. Energy, environment and health

The tax reform makes it more expensive to consume and produce goods that are harmful to the environment and climate. The tax reform also supports national and international climate- and environmental objectives.

Table 8.6 summarises the total estimated effects of the tax reform on different energy and environmental measures.

**Table 8.6. Estimated effects on energy and environment**

Elements related to:	Climate gases outside CO <sub>2</sub> -quota sector (Million ton)	Energy-consumption (PJ)	Renewable energy (PJ)	Emission of particles (Ton)	Discharge of nitrogen (Ton)	Discharge of phosphorus (Ton)	Emission of organic material (Ton)
Energy consumption	-0,5	-16,1	5,6	-30	-	-	-
Environmental issues	-0,0	-	-	-	-250	-95	-245
Vehicles	-0,0	-0,9	0,0	-30	-	-	-
Total effect	-0,5	-17,0	5,6	-30	-250	-95	-245



Besides the positive effects on health from the energy and environmental parts, the tax reform also contribute with a positive effect on health related issues through increased taxes on cigarettes and tobacco, sweets and chocolates and a new tax on fat in oils and dairy products.

These elements are expected to have a positive effect on the average lifespan and on different life-style diseases as diabetes and obesity.