

**UDENRIGSMINISTERIET**

**EUROPAUDVALGET**  
Alm. del - bilag 401 (offentligt)

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Bilag  
1

Journalnummer  
400.C.2-0

Kontor  
EU-sekt.

17. december 2002

Til underretning for Folketingets Europaudvalg vedlægges Finansministeriets  
supplerende notat vedrørende Konvergensprogram for Danmark.

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**THE UPDATED DANISH CONVERGENCE PROGRAMME 2002. SUPPLEMENTARY NOTE.**

**Revision of short term forecasts and sensitivity analyses**

The updated Danish *Convergence Programme 2002*, November 2002, (CP2002) is based on the short term forecasts in *Economic Survey*, August 2002. Since the release of CP2002, the short term forecasts for the Danish Economy have been updated, see *Economic Survey*, December 2002.

The new short term forecast implies somewhat lower growth the next couple of years than expected in CP2002. A pick up in activity is still expected, and the labour market continues to be tight. Public finances have been revised downward moderately in 2002 and 2003, mainly reflecting that unemployment is revised upward by some 13.000 persons in 2003 and certain technical revisions related to i.e. the treatment of swap-arrangements.

The assessment of fiscal sustainability and the structural general government balance has not been changed. The estimated level of structural unemployment is also more or less unchanged. Thus, the new short term forecasts have mostly cosmetic implications for the medium term projection presented in CP2002.

This paper gives a short overview of the new short term forecasts and also contains short term risk scenarios concerning public debt and deficits, supplementing the sensitivity analysis on fiscal sustainability presented in CP2002.

**Revision of short term forecasts**

Since the beginning of 2001 the international economy has experienced relatively low growth rates. This downturn in economic growth has been followed by a substantial expansion in both fiscal and monetary policy especially in USA, but also in Europe. The expansion of economic policy has together with automatic fiscal stabilisers averted a stronger decline in the international growth rates, although also postponed a restoration of private and public balance sheet problems.

The stock market decline has contributed to lower consumer and business spending. Hence, the recovery of the global economy has been postponed and is now expected to gather momentum later in 2003.

As a result the growth rate of GDP in 2003 in both USA and EU has been revised downward by around  $\frac{3}{4}$  percentage points to 2.3 per cent and 2.0 per cent respectively, cf. table 1. In 2004 the growth rate is estimated to reach 2.8 per cent in USA and 2.6 per cent in EU. These growth rates are in line with the provi-

sional external assumptions underlying the EU-Commission's Autumn 2002 forecasting exercise.

**Table 1. Comparison between the present and the previous forecast**

|                                      | 2001 | 2002   |      | 2003   |      | 2004 |
|--------------------------------------|------|--------|------|--------|------|------|
|                                      |      | CP2002 | Dec. | CP2002 | Dec. | Dec. |
| ----- Percentage change -----        |      |        |      |        |      |      |
| GDP growth USA.....                  | 0.3  | 2.3    | 2.3  | 3.0    | 2.3  | 2.8  |
| GDP growth EU .....                  | 1.5  | 1.1    | 1.0  | 2.6    | 2.0  | 2.6  |
| <i>Denmark:</i>                      |      |        |      |        |      |      |
| GDP growth.....                      | 1.0  | 1.5    | 1.5  | 2.2    | 1.8  | 2.1  |
| Private consumption .....            | 0.8  | 2.3    | 2.4  | 2.3    | 2.2  | 2.4  |
| ----- Percentage change -----        |      |        |      |        |      |      |
| Consumer prices, .....               | 2.4  | 2.3    | 2.4  | 1.8    | 2.0  | 1.8  |
| Hourly earnings, private sector ...  | 4.2  | 4.1    | 4.1  | 4.0    | 3.9  | 3.7  |
| ----- 1,000 persons -----            |      |        |      |        |      |      |
| Unemployment.....                    | 145  | 144    | 146  | 142    | 155  | 150  |
| ----- Per cent of labour force ----- |      |        |      |        |      |      |
| Unemployment.....                    | 5.1  | 5.0    | 5.1  | 4.9    | 5.4  | 5.2  |
| ----- Per cent of GDP -----          |      |        |      |        |      |      |
| General government balance .....     | 2.8  | 2.1    | 1.5  | 2.2    | 1.7  | 2.2  |
| Do EU-definition .....               | 3.0  | 1.9    | 1.5  | 2.0    | 1.7  | 2.2  |
| Do EDP-definition.....               | 3.0  | 2.0    | 1.6  | 2.1    | 1.9  | 2.4  |

Source: Statistics Denmark, EU-Commission, and own calculations.

In Denmark, real GDP is expected to increase by 1.8 per cent in 2003 following a moderate growth of 1.5 per cent in 2002. The estimate for 2003 has been revised downward by 0.4 percentage points compared to CP2002. This is mainly due to a downward revision of growth in net exports and fixed business investments. Growth in 2004 is forecast at 2.1 per cent which is a little above the estimated future trend growth.

Between January and October 2002 (seasonal adjusted monthly figures) unemployment has increased by 10.000 persons, a bit more than expected in CP2002. Therefore average unemployment in 2002 has been revised upwards by 2.000 persons to 146.000 persons compared to CP2002.

From 2002 to 2003 the average level of unemployment is expected to increase by 9.000 persons. This is a revision of approximately 13.000 persons, which is related both to the revision of the growth forecast for 2003 and to the expected higher level of unemployment at the end of 2002. In 2004 unemployment is expected to fall by 5.000 persons to an average level around 150.000.

Consumer price inflation is estimated at 2.4 per cent in 2002, 2.0 per cent in 2003 and 1.8 per cent in 2004. The estimate for 2002 has been revised upwards by 0.1 percentage point primarily due to higher than expected prices on services and energy. In 2003 the estimate has been revised upwards by 0.2 percentage points. This follows from a slower decline in the inflation rate of services than earlier expected, thus postponing the expected downturn in inflation.

Hourly wages in the private sector are expected to grow by 4.1 per cent in 2002 and 3.9 per cent in 2003. Compared to the estimates in August the estimate for 2003 has been revised a little downward. This is primarily due to the expected rise in unemployment in 2003. Hourly wages are expected to grow by 3.7 per cent in 2004.

The general government surplus is estimated at 1.5 per cent of GDP in 2002, 1.7 per cent of GDP in 2003 and 2.2 per cent of GDP in 2004. This is a downward revision of 0.6 and 0.5 percentage points in 2002 and 2003, respectively, compared with CP2002, whereas estimates for 2004 is included for the first time in the short term forecasts. Part of the revision for 2002 and 2003 follows from a technical revision by Statistics Denmark of the national accounts for 1999 to 2001<sup>1</sup>. The remaining downward revision of the government surplus is almost entirely due to a downward revision of the employment forecast and higher envisaged unemployment.

#### **Impact of the technical revision of the general government balance**

For the period 1999 to 2001 the general government surplus is lowered due to technical revisions of the national accounts by Statistics Denmark, *cf. box 1*. For the forecast years 2002 to 2004 the technical revisions implies a downward revision of the government surplus by approximately 0.25 per cent of GDP.

#### **Box 1. A statistical revision of the general government balance**

The technical revisions (according to new national account definitions) of the government surplus in 2002 and 2003 concerns partly swap-arrangements where public sector net expenditures are to be calculated excluding net interest settlements due to swap-arrangements. This implies an upward revision of central government net interest expenditures, which is fully offset by an upward revision of central government net assets.

Further, the revision implies that imposed taxes, which in fact are never paid by the private households and firms are to be written off. This is now treated as a capital transfer to the private sector. The counterpart is that the general government cease to accumulate gross assets of no value.

The technical revisions increase the central and local government expenditure burden and reduce the measured general government surplus by approximately 0.25 per cent of GDP from 1999 onwards. The technical deterioration of public finances is completely (and also technically) offset by revisions of government net assets which contributes to a technical lowering of the future net interest burden of the central and local government net debt. This means that the technical revisions do not impact the sustainability of public finances.

Especially the revisions of government finances due to SWAP-arrangements can fluctuate from to year. For the medium term period from 2005 to 2010 it is estimated that the technical revisions implies a lowering of general government surpluses by on average about 0.25 per cent of GDP.

The technical revisions do not affect the EMU-debt which is calculated on the basis of the public sector gross debt.

<sup>1</sup> See *Statistiske Efterretninger*, Offentlige finanser 2002:29, Statistics Denmark.

### Revisions of estimates of fiscal sustainability

The technical revisions have no impact on fiscal sustainability. The local and central government surplus required for long term sustainability is thus lowered by the same amount as the technical revisions of the general government surplus, *cf. table 2*. For 2003 the sustainability indicator is 0.1 per cent of GDP in line with previous estimates for 2003.

For 2003 the deviation between the actual and structural primary surplus is estimated at -0.6 per cent of GDP, *cf. table 2*, whereas the deviation was previously estimated at -0.2 per cent of GDP.

**Table 2. Sustainability of public finances**

|  | 2003       | 2004       |
|--|------------|------------|
| -- Per cent of GDP --  |            |            |
| <b>Balance of public finances:</b>   |            |            |
| General government surplus .....   | 1.7        | 2.2        |
| - of which ATP .....   | 0.9        | 0.7        |
| - of which central and local government.....                                 | 0.8        | 1.5        |
| Central and local governments net interest expenditures                      | 2.0        | 1.8        |
| Central and local government primary surplus.....                            | 2.7        | 3.4        |
| Deviations between actual and structural primary surplus.....                | -0.6       | 0.3        |
| <b>Central and local government structural primary surplus .....</b>         | <b>3.3</b> | <b>3.1</b> |
| <b>The impact of future obligations:</b>                                     |            |            |
| Public consumption, tax freeze and lower tax on labour income.....           | 3.0        | 3.0        |
| Increase in net taxes from private pension funds .....                       | -1.4       | -1.5       |
| Taxes from North Sea oil and gas production.....                             | 0.6        | 0.6        |
| Burden of net expenditures on public net debt.....                           | 1.0        | 0.9        |
| <b>Requirement of central and local gov. structural primary surplus ....</b> | <b>3.2</b> | <b>3.0</b> |
| <b>Sustainability indicator .....</b>  | <b>0.1</b> | <b>0.1</b> |

1) After 2010 a technical assumption of increases in underlying tax revenues in line with GDP-growth is applied.

Note: Details may not add because of roundings.

### Sensitivity analyses

The uncertainty surrounding the economic development in the forthcoming years centres particularly on international conditions.

However, the assessment is that the Danish economy is relatively well prepared if the slowdown in the international economy should be prolonged. Yet a downturn in international demand will inevitably affect the outlook for output and domestic employment negatively. Still, under such circumstances, factors such as lower commodity prices and possibly also lower interest rates would pull in the opposite direction.

It is estimated that a reduction in international growth of 1 per cent in 2003 compared to the forecast would only have an effect of 0.2 per cent on growth in Denmark if international and hence Danish interest rates are adjusted according to an estimated Taylor-rule, *cf. table 3*. This implies that

both general government finances and the balance of payments would weaken by around 0.1 per cent of GDP. The effects on growth are inherently amplified if the pronounced international downturn is followed or caused by increases in commodity prices that weaken the possibilities of lower interest rates.

**Table 3. The effect of lower international growth**

|   | 2003                 | 2004  | 2005 | 2006 |
|---|----------------------|-------|------|------|
| <i>Assumptions for international growth</i>   | ----- Per cent ----- |       |      |      |
| Foreign GDP level .....                       | -1.0                 | -0.5  | 0.0  | 0.0  |
| Interest rates .....                          | -0.3                 | -0.15 | 0.0  | 0.0  |
| <i>Danish economic indicators</i>             |                      |       |      |      |
| GDP level.....                                | -0.2                 | 0.1   | 0.3  | 0.2  |
| Balance of payments, per cent of GDP.....     | -0.1                 | -0.2  | -0.1 | 0.0  |
| General government finances, per cent of GDP. | -0.1                 | -0.0  | 0.1  | 0.1  |

Note: The Medium Term Economic Survey for 2000 estimated a reaction function (a so-called Taylor rule) for the US and EU central banks, implying that a reduction of the output gap of 1 percentage point typically triggers a decrease in interest rates of about 0.3 percentage points in both the USA and in the euro area. Because of the fixed exchange rate of the Danish krone, this will lead to a similar decrease in Danish interest rates. This decrease will lift private consumption as well as investments and thereby partly offset the effect of slower export market growth on exports. Long-term interest rates are assumed to change in parallel with short-term interest rates. The central banks of Denmark's other trading partners are also assumed to copy actions taken by the US Fed and the ECB.

The scenario assumes that the international output gap will subsequently return to its former level. Accordingly, the fall in interest rates will only be temporary.

On balance, lower cyclical growth in foreign GDP – followed by lower interest rates – thus has a limited effect on GDP growth in Denmark. The growth composition will, however, change towards smaller contributions from net exports and higher contributions from domestic demand, and thus reduce the surplus on the current account.

If the current slowdown in growth turns out to last much longer than anticipated, the effect on general government finances, etc., will inherently be larger. If growth in Denmark and abroad is half a percentage point lower than expected from 2003 to 2006 – a decrease in the international output gap of no less than two percentage points, accordingly – and the level of interest rates remains unaffected, general government finances in 2006 will weaken by almost 1½ per cent of GDP and general government debt will be around 4½ per cent of GDP higher than expected. Since domestic demand will be considerably subdued in such a situation, the balance of payments will improve despite lower exports, cf. table 4.

**Table 4. Effect of GDP growth falling by half a percentage point in Denmark and abroad with unaffected nominal interest rates**

|                                  | 2003                        | 2004 | 2005 | 2006 |
|----------------------------------|-----------------------------|------|------|------|
|                                  | ----- Per cent of GDP ----- |      |      |      |
| Balance of payments.....         | 0.1                         | 0.2  | 0.2  | 0.3  |
| General government finances..... | -0.3                        | -0.6 | -1.0 | -1.4 |
| General government debt .....    | 0.5                         | 1.4  | 2.7  | 4.5  |

Note: The reduction in Danish growth has been calibrated by exogenously adjusting private consumption and investments. The impact on the balance of payments depends upon the composition of demand components of the reduction of growth in the Danish economy.

Source: Own calculations.

Table 5 shows an overall estimate of the interest rate sensitivity of general government finances. It appears that a permanent (externally triggered) increase in interest rates in Denmark and abroad of 1 percentage point (assuming an unchanged yield curve) will weaken general government finances by about 1 per cent of GDP over a period of four to five years, mainly due to lower economic activity.

Such a combination is however not likely to occur, as higher interest rates would most likely rather be the probable outcome in case of higher growth rates.

**Table 5. Effect of a increase in interest rates of 1 percentage point**

|                                  | 2003                        | 2004 | 2005 | 2006 |
|----------------------------------|-----------------------------|------|------|------|
|                                  | ----- Per cent -----        |      |      |      |
| GDP level.....                   | -0.2                        | -1.1 | -1.5 | -1.6 |
|                                  | ----- Per cent of GDP ----- |      |      |      |
| General government finances..... | -0.1                        | -0.6 | -0.9 | -1.1 |
| General government debt .....    | 0.1                         | 0.9  | 2.0  | 3.2  |

Source: Own calculations.

The long run sustainability of fiscal policy is only affected to a small extent because higher interest rates also results in larger private pensions funds in the long run due to higher investment returns. This implies that the future tax value of pension payments increases as well, thus improving public finances in the long run<sup>2</sup>.

<sup>2</sup> It should be pointed out that the effects have been calculated on the assumption of a parallel increase in Danish and foreign interest rates. If only Danish interest rates (the interest rate spread) rise, the effects are clearly negative. The interest rate balance of the private sector will generally worsen, thus lowering tax receipts. In this case, only the rate of interest on Denmark's gross liabilities will increase – not that affecting gross assets.

On balance, it is the assessment that Denmark will continue to meet the convergence criteria, even if important assumptions for the forecasts undertake substantial changes.

#### Appendix. Comparison tables.

**Table 1. Comparison between the present and the previous forecast**

|   | 2002   |          | 2003   |          | 2004     |
|---|--------|----------|--------|----------|----------|
|   | CP2002 | December | CP2002 | December | December |
| ----- Percentage changes -----                |        |          |        |          |          |
| Private consumption .....                     | 2.3    | 2.4      | 2.3    | 2.2      | 2.4      |
| Total government demand .....                 | 1.4    | 1.3      | 0.8    | 0.6      | 1.1      |
| Of which government consumption .....         | 1.3    | 1.3      | 0.7    | 0.7      | 1.1      |
| Of which government investment ....           | 2.0    | 2.0      | 2.0    | 0.0      | 2.0      |
| Residential construction .....                | -2.0   | -4.0     | 1.5    | 1.0      | 2.0      |
| Fixed business investment .....               | 0.2    | 1.5      | 3.4    | 2.7      | 3.8      |
| Domestic demand excl. stocks.....             | 1.5    | 1.4      | 2.1    | 1.8      | 2.4      |
| Changes in stock building <sup>1)</sup> ..... | -0.2   | -0.1     | 0.0    | 0.0      | 0.0      |
| Total domestic demand .....                   | 1.2    | 1.6      | 2.2    | 1.9      | 2.3      |
| Exports of goods and services .....           | 4.3    | 2.8      | 5.1    | 3.8      | 5.8      |
| Of which manufactures .....                   | 4.3    | 3.5      | 6.0    | 4.5      | 5.5      |
| Total demand .....                            | 2.2    | 2.0      | 3.0    | 2.5      | 3.5      |
| Imports of goods and services .....           | 3.9    | 3.2      | 5.1    | 4.3      | 6.8      |
| Of which goods <sup>2)</sup> .....            | 4.2    | 5.0      | 5.5    | 4.9      | 6.8      |
| Gross domestic product .....                  | 1.5    | 1.5      | 2.2    | 1.8      | 2.1      |
| GDP at factor costs .....                     | 1.3    | 1.2      | 2.4    | 1.9      | 2.1      |
| Of which in non-agricultural sector .         | 1.2    | 1.4      | 2.8    | 2.2      | 2.5      |
| ----- Changes in thousand persons -----       |        |          |        |          |          |
| Labour force .....                            | 4.2    | -5.9     | 10.8   | 12.3     | 7.8      |
| Employment .....                              | 5.7    | -6.3     | 12.8   | 2.8      | 12.8     |
| Of which in the private sector .....          | -0.3   | -12.3    | 9.8    | -0.2     | 8.8      |
| Of which in the public sector .....           | 6.0    | 6.0      | 3.0    | 3.0      | 4.0      |
| Unemployment .....                            | -1.5   | 0.4      | -2.0   | 9.5      | -5.0     |

1) Contribution to the GDP-growth rate.

2) Excluding production of oil and gas and maritime.



**Table 2. Comparison between the present and the previous forecast**

|  | 2002  |          | 2003   |          | 2004     |
|--|---|----------|--------|----------|----------|
|  | CP2002  | December | CP2002 | December | December |
|  | ----- Percentage changes from previous year ----- |          |        |          |          |
| Merchandise export prices .....                  | -0.8  | -1.1     | 1.2    | 0.6      | 1.0      |
| Merchandise import prices.....                   | 0.1   | -0.6     | 0.7    | 0.6      | 0.7      |
| Merchandise terms of trade.....                  | -0.8  | -0.5     | 0.5    | 0.0      | 0.4      |
| Real estate prices for one-family<br>houses..... | 2.5   | 2.5      | 2.5    | 2.0      | 1.5      |
| Consumer price index.....                        | 2.3   | 2.4      | 1.8    | 2.0      | 1.8      |
| Hourly earnings.....                             | 4.2   | 4.1      | 4.1    | 3.9      | 3.7      |
| Real disposable income, private<br>sector.....   | 1.9   | 2.9      | 2.7    | 2.2      | 1.7      |
| Productivity in non-agricultural<br>sector.....  | 1.4   | 2.2      | 2.3    | 2.3      | 2.1      |
|  | ----- Per cent -----                              |          |        |          |          |
| Savings ratio in the private sector.             | 28.8  | 29.4     | 29.1   | 29.3     | 28.8     |
| 10-year government bond .....                    | 5.3   | 5.1      | 5.5    | 4.9      | 5.3      |
| 30-year government bond.....                     | 6.5   | 6.4      | 6.6    | 6.2      | 6.6      |
| Current account.....                             | 31.5  | 28,0     | 35.0   | 29,0     | 30,0     |
| Government net lending.....                      | 29.8  | 21,4     | 32.1   | 24,6     | 33,5     |
| Unemployment (thousands) .....                   | 144   | 146      | 142    | 155      | 150      |
|  | ----- Per cent -----                              |          |        |          |          |
| GDP growth in OECD countries..                   | 1.5   | 1,5      | 2,9    | 2,5      | 3,0      |
| International market growth .....                | 1,4   | 0,4      | 7,8    | 6,5      | 8,4      |
| Dollar exchange rate .....                       | 7,9   | 7,9      | 7,6    | 7,6      | 7,6      |
| Price of oil (USD per barrel) .....              | 24  | 25       | 25     | 26       | 25       |
| Price of oil (DKK per barrel) .....              | 189,6   | 197,5    | 190,3  | 197,9    | 190,3    |

Source: Statistics Denmark and own calculations.

Table 3. Comparison between the present and the previous forecast

|  | 2002                        |          | 2003   |          | 2004     |
|--|-----------------------------|----------|--------|----------|----------|
|  | CP2002                      | December | CP2002 | December | December |
|  | ----- Per cent of GDP ----- |          |        |          |          |
| Short-term interest rate (annual avg.).....  | 3.7                         | 3.5      | 3.9    | 3.5      | 4.1      |
| Long-term interest rate annual average) .....  | 5.3                         | 5.1      | 5.5    | 4.9      | 5.3      |
| USA: long term (10-year gov-ernment bonds) .....                                       | 5.0                         | 4.6      | 5.5    | 4.3      | 5.0      |
| USD/EURO exchange rate (annual average).....   | 0.94                        | 0.94     | 0.98   | 0.98     | 0.98     |
| <i>(for non-euro countries) exchange rate vis-à-vis the EURO (annual average).....</i> | 7.43                        | 7.43     | 7.46   | 7.46     | 7.46     |
| World excluding EU. GDP growth .....   | 3.0                         | 2.9      | 3.9    | 3.9      | 4.2      |
| US.....  | 2.4                         | 2.3      | 2.4    | 2.3      | 2.8      |
| Japan .....  | -0.6                        | -0.6     | 1.2    | 1.2      | 1.4      |
| EU-15 GDP growth .....   | 1.0                         | 1.0      | 2.1    | 2.0      | 2.6      |
| Growth of relevant foreign markets.....  | 1.4                         | 0.4      | 7.8    | 6.5      | 8.4      |
| World import volumes. Ex-cluding EU.....   | 3.2                         | 3.1      | 6.8    | 6.6      | 7.3      |
| Oil prices. (Brent USD/barrel).  | 24.0                        | 25.0     | 25.0   | 26.0     | 25.0     |
| Non-oil commodity prices (in USD).....   | 1.1                         | 1.1      | -0.4   | -0.4     | -1.3     |