Statistisk sentralbyrå
Statistics Norway

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Voorburg group meeting - Oslo 2009

Wednesday 16th of September

Research in Statistics Norway: The Norwegian Economy

- Norwegian Economy
  - The importance of the petroleum sector
  - The current economic situation and short term forecasts
- Tax cut or increased demand from public sector: What works in fighting the recession?

Research department in Statistic Norway

- 100 persons – 10% of SN

- Objektives
  - Provide empirical based information about the Norwegian economy and society in general
  - Develop and maintain analytical tools for planning and policy-making in government
  - Analyse statistics as part of quality control → feedback to the statistics

- Research areas
  - Social and demographic research
  - Public economics
  - Macroeconomics
  - Resource and environmental economics
  - Microeconometrics

- Research is also carried out in other part of the organisation
  - The research unit “Statistical methods and standards” is not in the RD
  - Some research is also carried out in units producing statistics

Social and demographic research

- Population projections
- Demographic research
- Social research (living conditions, social change, time use, labour market)

Public economics

- Modelling direct and indirect taxation (revenues, income distribution)
- Modelling the pension system
- Modelling local government spending

Macroeconomics

- Business cycle analysis (assessment and forecasting)
- Macroeconometric modelling and policy analysis
- General equilibrium modelling and policy analysis of structural reforms

Resource and environmental economics

- Models of Nordic and Norwegian electricity markets
- Global models of energy markets
- Global and national environmental policy issues

Microeconometrics

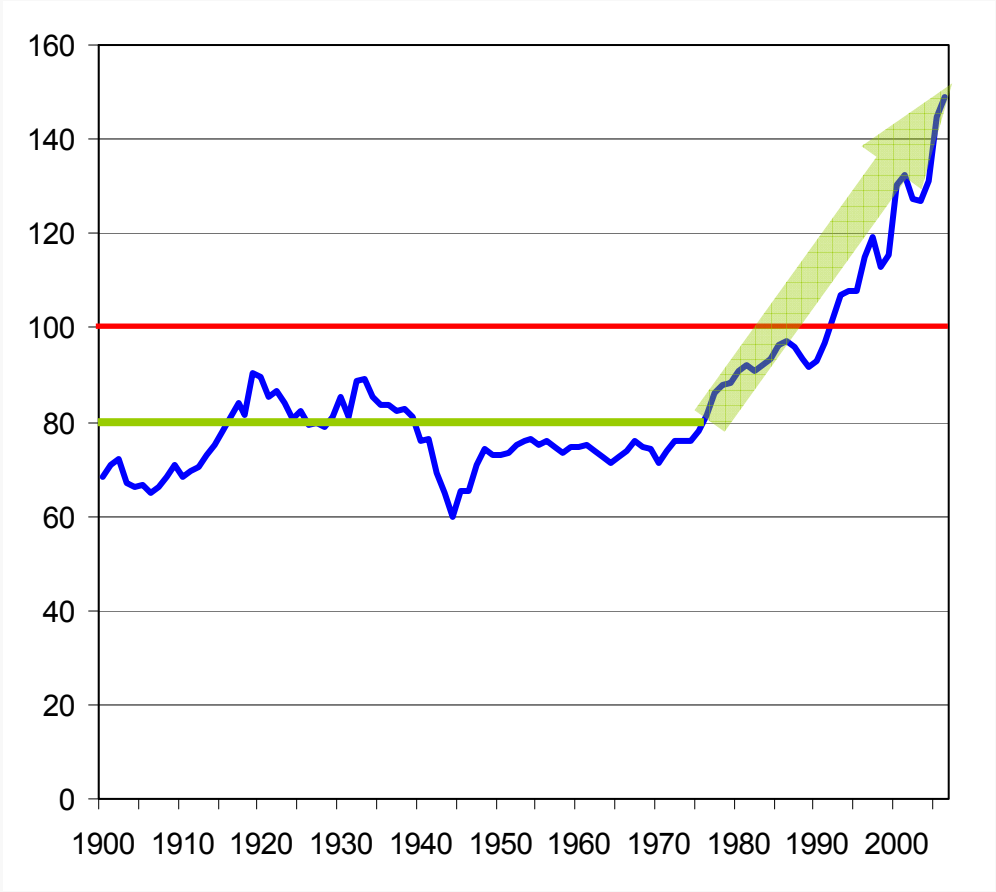
- Modelling labour supply
- Consumer behaviour
- Producer behaviour and productivity
- Welfare and inequality, methods and international comparisons

The Norwegian economy: A fairytale?

From “poor” to rich

- Something happened around 1970…
  - **OIL!**
  - But oil not the only answer..
    - Increased participation rates
    - ”China-effect” in recent years → improved terms of trade
- 2008: Norwegian GDP per capita **190**% of average EU27 (eurostat)
- But oil is a non-renewable resource – extraction is transformation of wealth
  - in reality the oil rent part of value added in the petroleum sector is not income…….

GDP pr capita – PPP adjusted
– Norway versus Sweden (=100)



Oil rent

- Residual income when factors of production have received their normal rewards (factor payments)

  Gross operating surplus
  + indirect taxes paid
  - total capital costs (normal returns and depreciation costs)
  = Oil rent

- 2008 – OIL RENT
  - 18% of GDP
  - Without oil, but with normal returns to the input factors used in the petroleum sector, our GDP would have been 82 % of what it was. Still high!
  - GDP per capita 190% of average EU27 → adjusting for oil rent

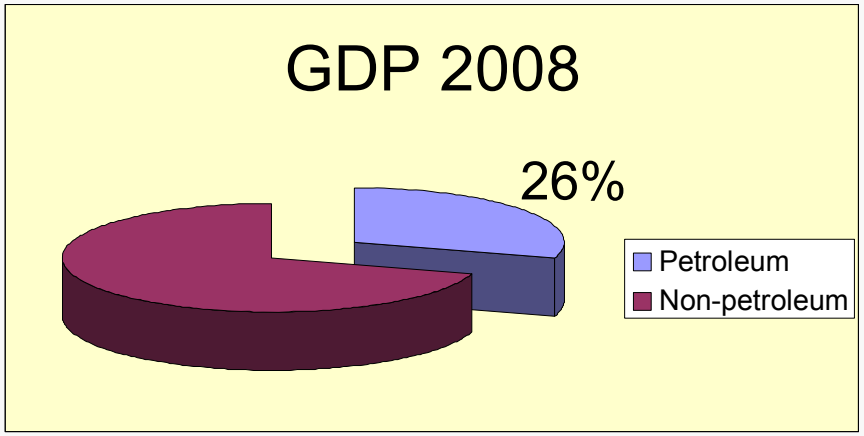
  → 156% of average EU27

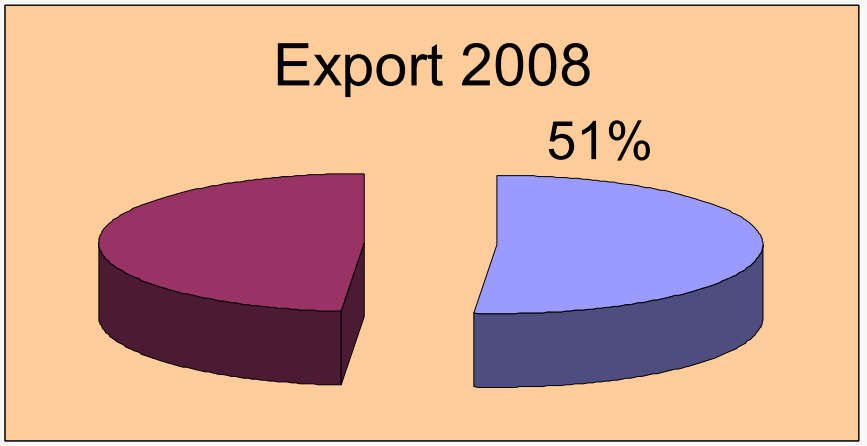
Petroleum related economic policy in Norway

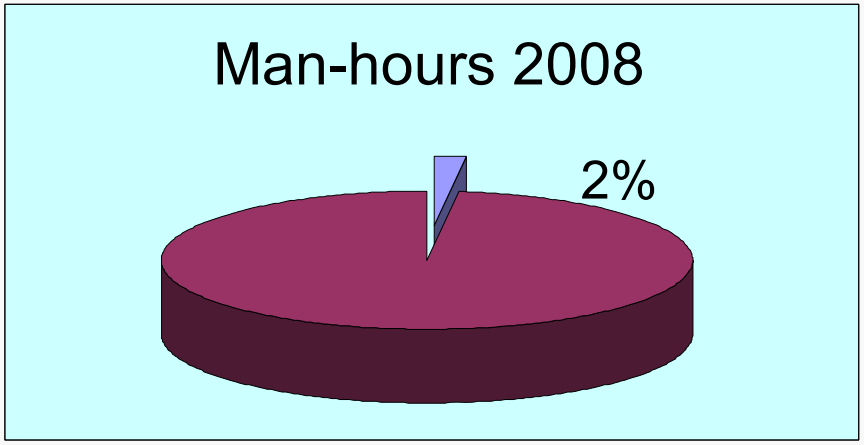
- Initially stimulating national oil industry (extraction, producing investment goods and intermediate inputs)
- Public control over oil revenues: 85-90% of oil rent to the government
- Separate production/income from spending of income
  - Important to prevent large fluctuations
  - Intergenerational distribution

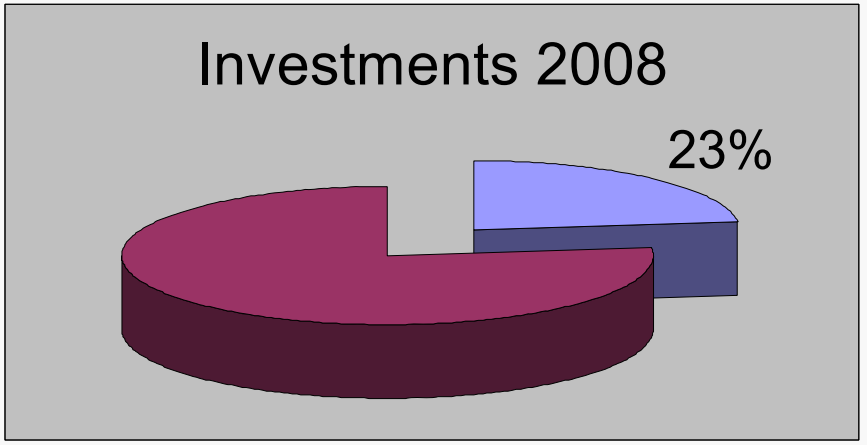
  →Income from petroleum (budget surplus) is now invested in non-Norwegian financial instruments - Government Pension Fund – Global (former known as The Petroleum Fund)
    - In the beginning most of the revenues was invested in real capital in the petroleum sector
  - A prudent Fiscal Policy Rule from 2001
    - Spend only expected real return of the petroleum wealth transferred to financial wealth (the pension fund)

The Norwegian petroleum sector in NA-figures







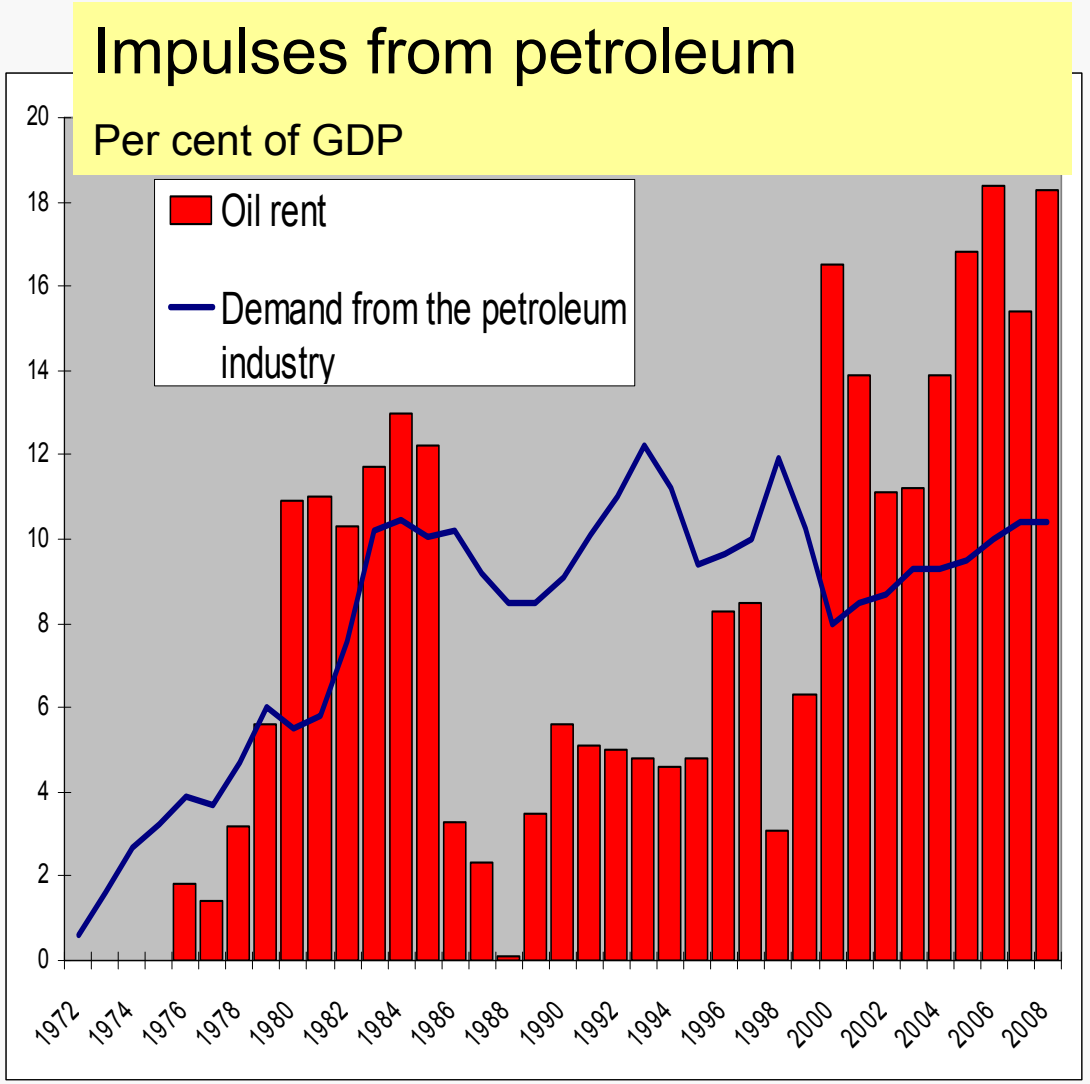


Petroleum and the Norwegian economy: 2 kinds of impulses

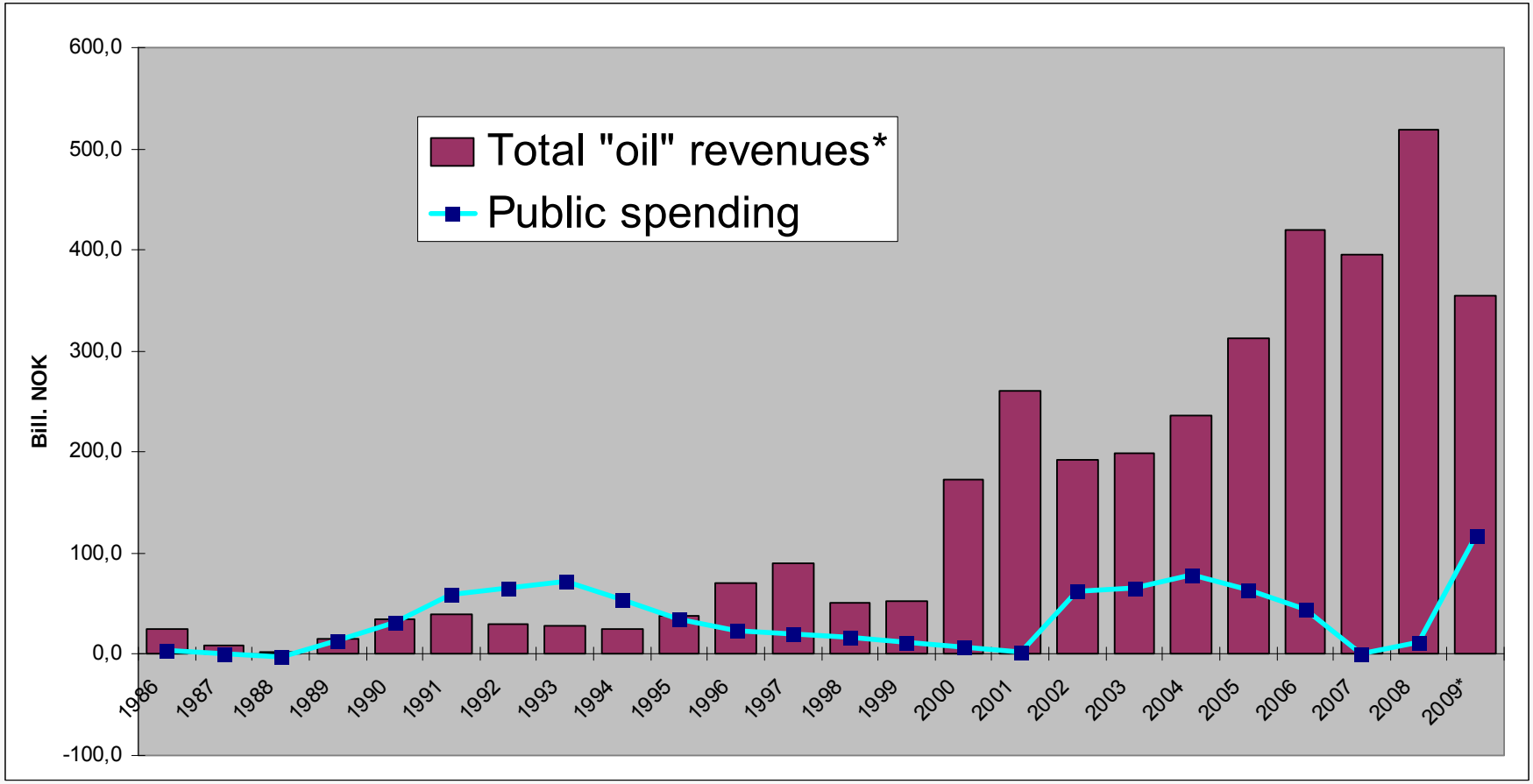
1) Income →Public spending

- 85-90% of oil rent to public sector
- Invested in Government Pension Fund
- From 2001 fiscal rule: Spending 4% of fund
  - Spending defined as structural oil-corrected budget deficit
  - 2009
    - Rule: **4,8**% of GDP M
    - Actual according to MoF: **7,2**% of GDP M
    - → The fiscal rule is flexible guide line – not a strait jacket

2) Demand from extraction activity
    - Labour
    - Intermediate input
    - Investments
  - Large contribution to the Norwegian business cycles

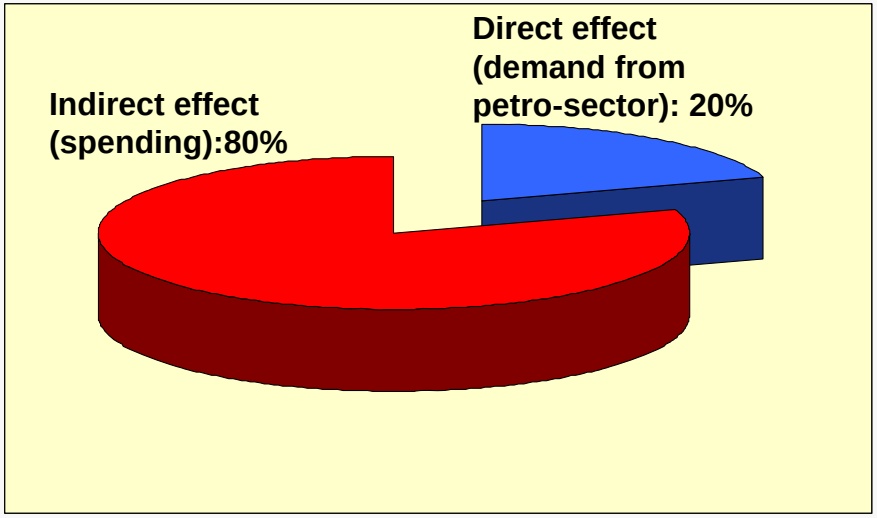


Public revenues from petroleum and fund*, spending (oil-adjusted budget deficit)



Effects of the oil sector on the Norwegian economy

Effects on GDP Mainland 1993



"Norway without oil – 1973-93"

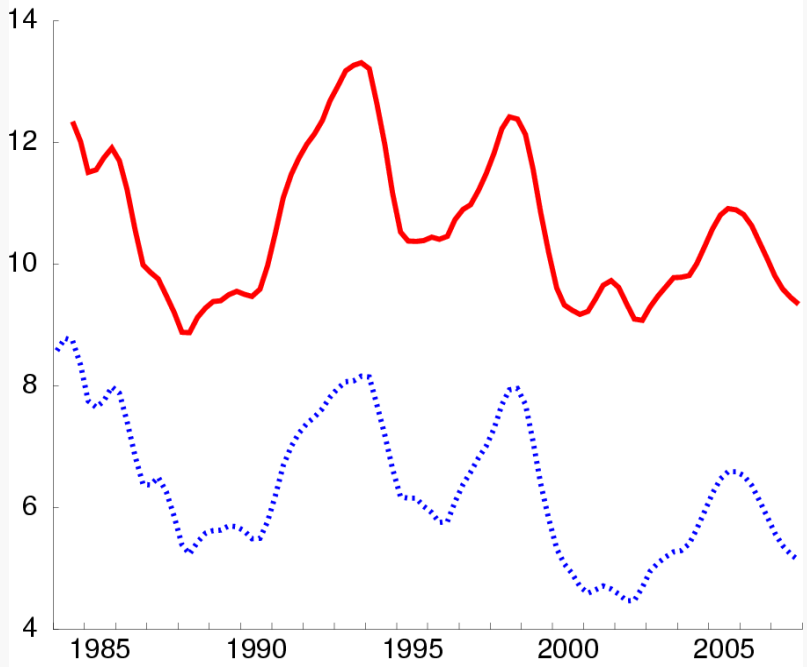
- Total effect = GDP factual – GDP Norway without oil
- Results – levels in **1993**
  - GDP Mainland **+27,5**%
  - GDP **+51,4%**
  - Oil rent **4,8%** of GDP (5,4% of non-oil GDP)
    - Petroleum value added **12,8%** of GDP (14,7% of non-oil GDP)

Effects of the oil sector on the Norwegian economy - cont.

- Why is the GDP-effect > value added in the petroleum sector?
  - Increased capacity utilisation (demand from the petroleum sector, higher demand from general government and more powerful fiscal policy)
    - Reduced unemployment
  - Higher labour supply (higher real wages)
  - Higher productivity (reallocation)
    - Off shore petroleum extraction and petroleum related industry: High tech clusters contribute to the rest of the economy

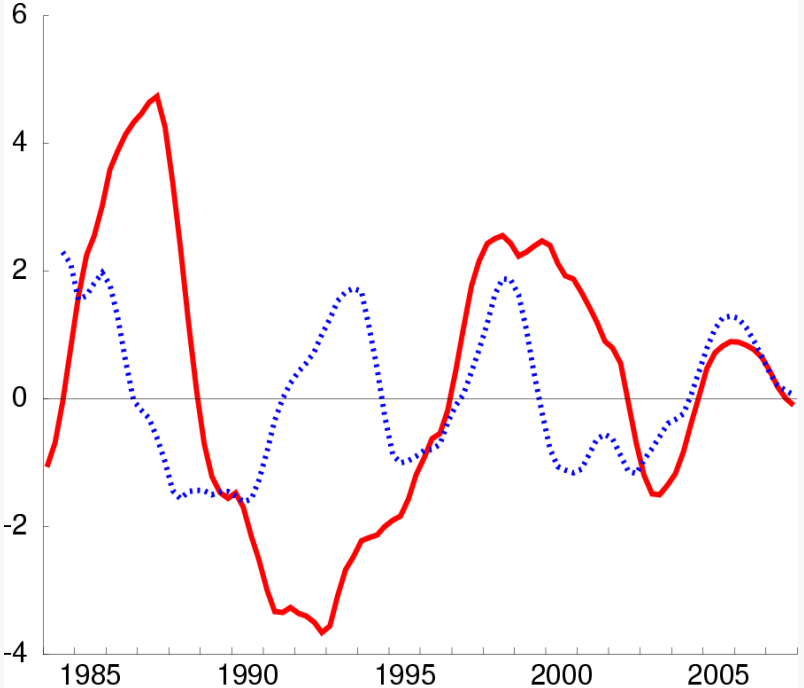
Simulation experiment: The cyclical effects of the demand side of the petroleum activity

Figure 2. Factor inputs as a fraction of GDP-M
Per cent



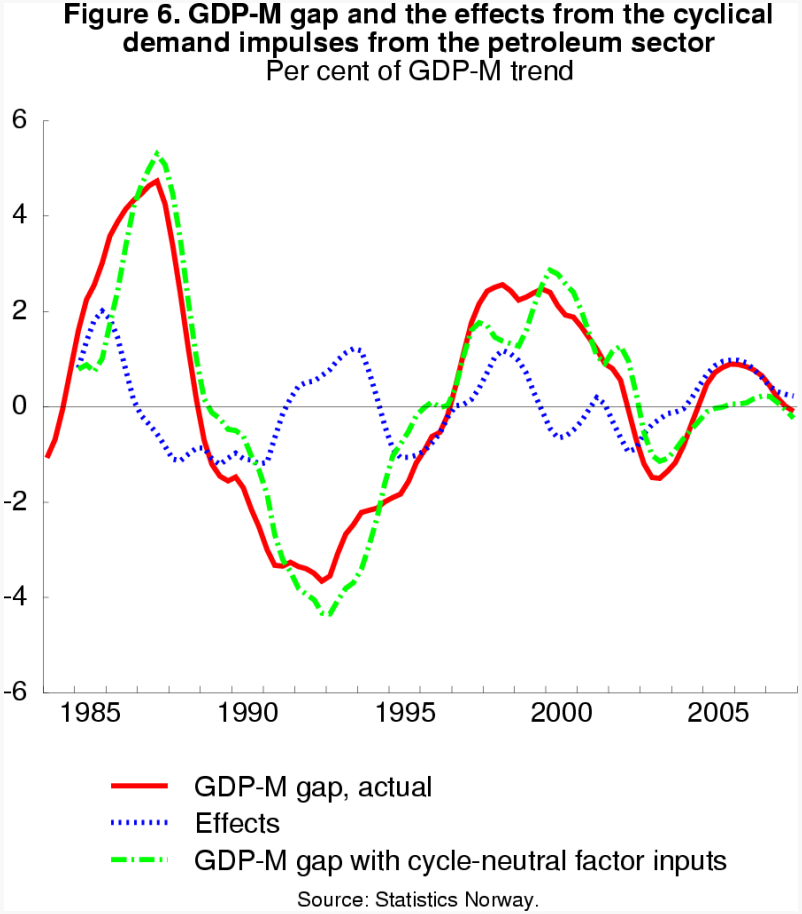
Source: Statistics Norway.

Figure 5. Cyclical demand impulses from the petroleum sector and the GDP-M gap



Source: Statistics Norway.

Results: GDP-M gap



- Actual (A)
- Counter factual (C) – smoothed inputs
- Effects from cycles in factor inputs = A – C
- Magnitude of the effects:
  - Mean | A - C | → **0.9%**
- Measuring the magnitude of the cycles
  - Mean | C – A-trend | → 1.6%
  - Mean | A – A-trend | → 1.9%
  - → Contribution from the petro-impulses: **0,3**%
- The impacts from the cyclical activity in the petroleum sector are
  - large
  - Generally reinforcing the business cycle, but not dominating

Latest forecasts for the Norwegian economy

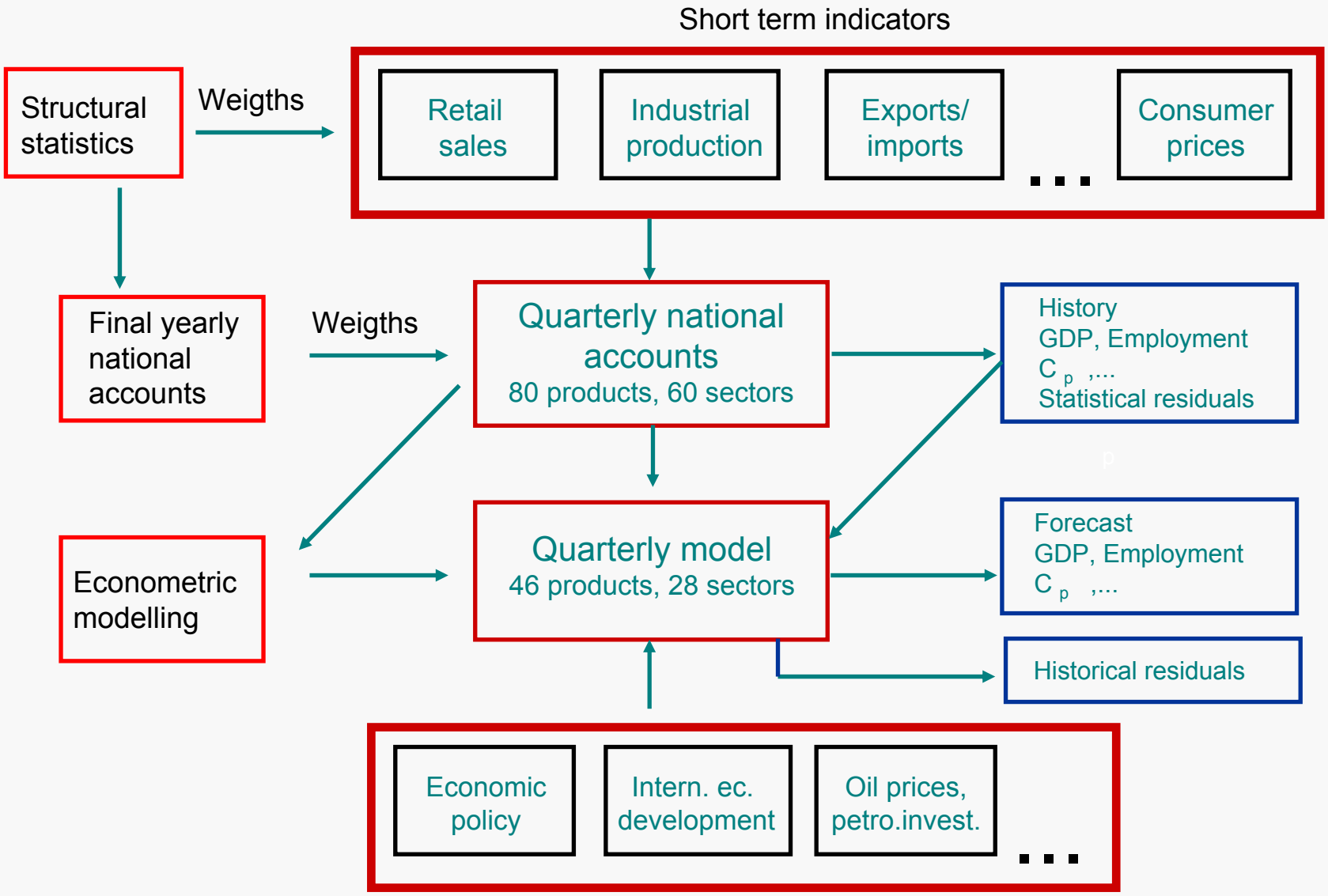
"As far as we can project, barring some unexpected event, our fund should continue to yield about 35% per annum forever."

Quarterly National Accounts published with a lag of 8 weeks

Standard forecasts are provided free of charge 9 days after release of new quarterly NA figures

KVARTS – a quarterly econometric Large Scale Model is the workhorse in SN short term forecasting

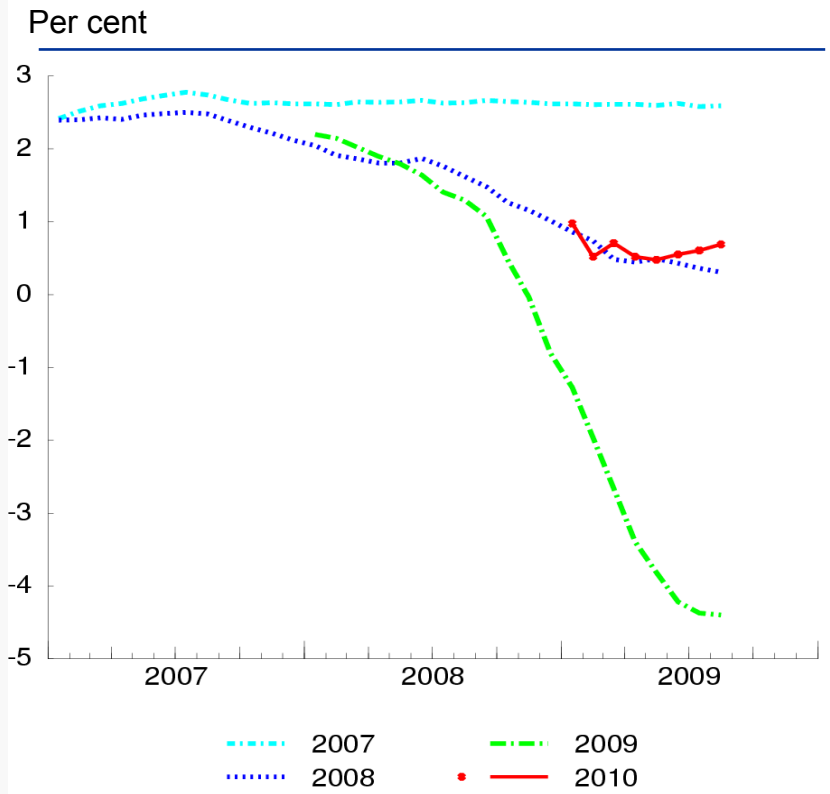
Statistics Norway – Accounting and Forecasting



The greatest recession in the international economy since WW2:

Clear signs of less severe cyclical downturn

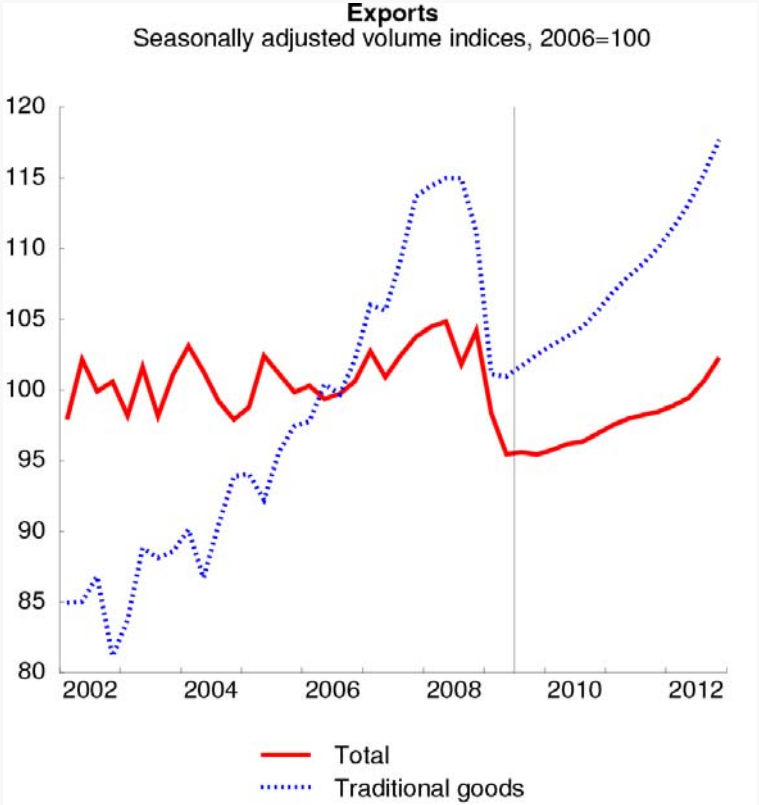
GDP-growth Norway's trading partners – Consensus Forecasts given on different dates



SN forecasts. Growth in per cent	007	2008	2009	2010
GDP TP	2.9	0.6	-3.9	0.6
Exp.market indicator	7.2	1.6	-10.0	1.6

- A strong contraction in the wake of the credit crisis
  - 4 quarters with falling GDP in many OECD-countries
- Expansionary policies has dampened the recession
  - Dampening of GDP-decline in USA and in EU
  - Recovery in Asia
  - Signs of improvement in the worlds housing markets
  - Increase in stock market and prices of raw materials
  - Less pessimism and more optimism
- Increasing activity
  - Cyclical upturn in 2011
- Risk factors
  - Bank loss → more problems in the credit market
  - Deflation – inflation
  - Government debt out of control?
  - …. It may get much worse...

Better, but still tough times for export industries



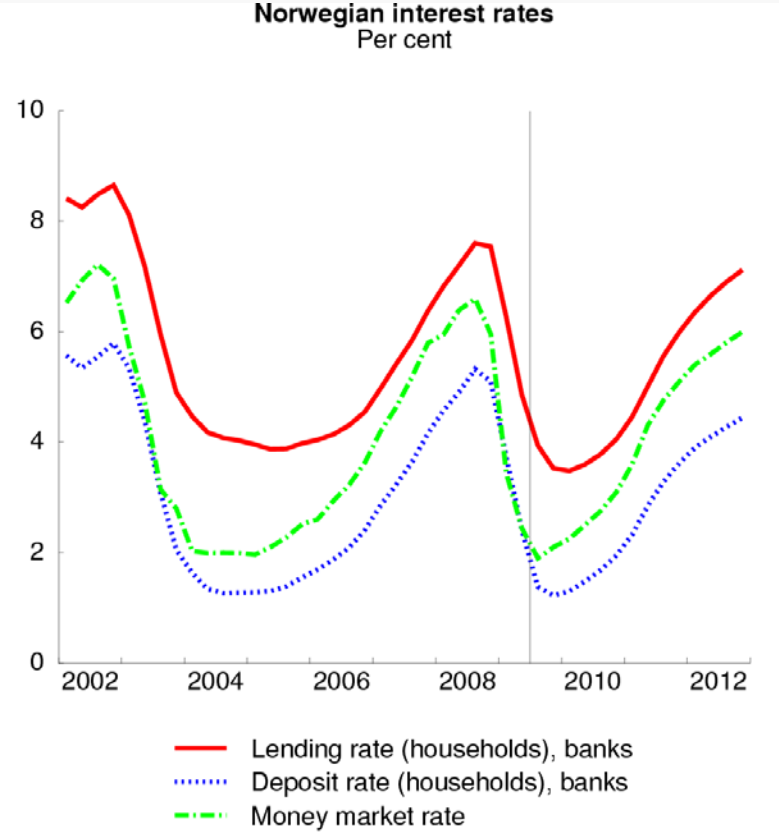
Growth rates in %	2007	2008	2009	2010	2011	2012
Export vol., trad.	8.7	4.8	-10.6	2.7	4.2	5.2
Export prices, trad.	2.5	2.3	-6.5	-0.8	5.7	5.2
Int. market growth	7.2	1.6	-10.0	1.6	4.1	7.8

Source: Statistics Norway. f0201f09

- Increased demand from international markets
- Growth in traditional exports increases gradually
- Strengthened exchange rate and growth in wage cost dampens the export growth
- Decreasing oil extraction and increasing gas extraction → decreasing petroleum export

- …. But things can get worse...

Increasing interest rates

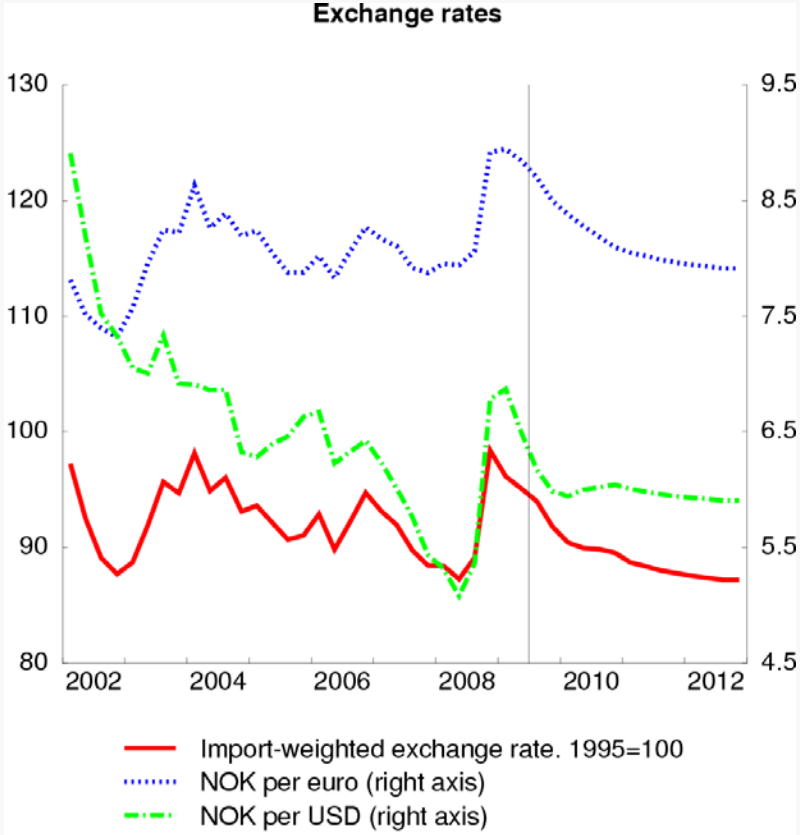


Per cent	2007	2008	2009	2010	2011	2012
3 m. NOK	5.0	6.2	2.5	2.7	4.4	5.7
Lending rate	5.7	7.3	4.7	3.7	5.3	6.8

Source: Norges Bank and Statistics Norway. f0201f03

- Recession brought interest rates down to record low levels
  - Norwegian money market met bottom early in August by 1,75
- Better times pushes interest rates up – more in Norway than euro area
  - Norwegian signal rates up in December
  - More frequent increases through 2011
  - Money market rate increases further up to 6 per cent in the end of 2012
- Time lag from money market to bank lending rates. Bottom in 2009 Q4 or Q1 2010
- Norwegian households: 83,4% floating lending rates

Prospects of strengthened exchange rate

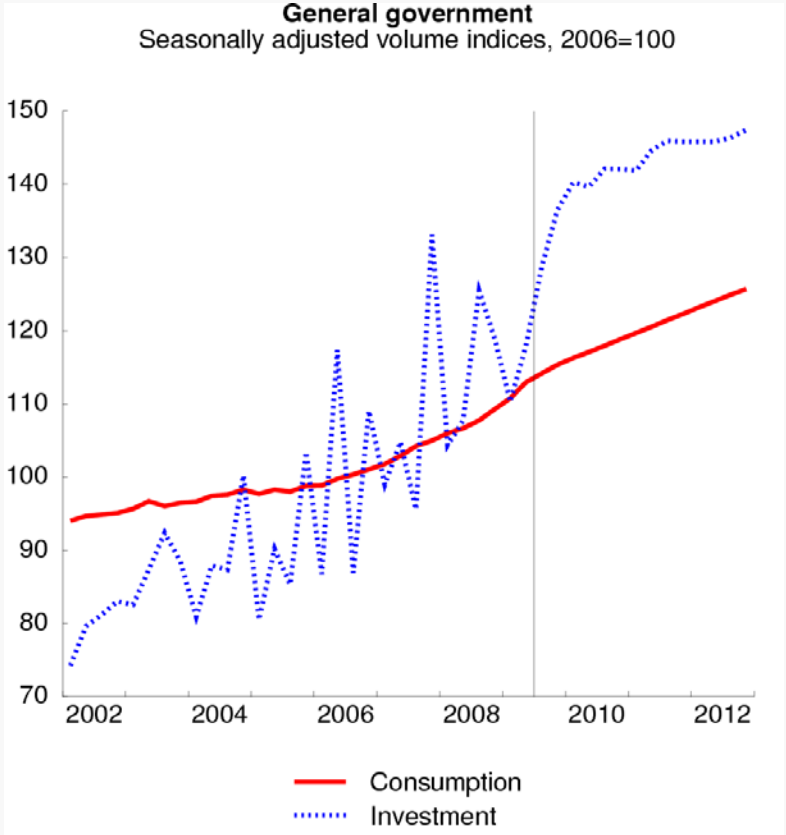


Growth rates in %	2007	2008	2009	2010	2011	2012
Imp.-weigh. exch.rate	-1.7	0.0	3.8	-4.6	-1.9	-1.0
Imp.price, trad. goods	3.7	3.2	-1.8	-3.4	2.1	2.7

Source: Norges Bank. f0201f04

- We expect the Krone to appreciate gradually from 8.63 today to 7.90 against euro in 2012
- Appreciation because:
  - Increasing interest rate gap
  - Higher oil prices
- But higher inflation is dampening the appreciation

Expansionary fiscal policy – and sustainable!

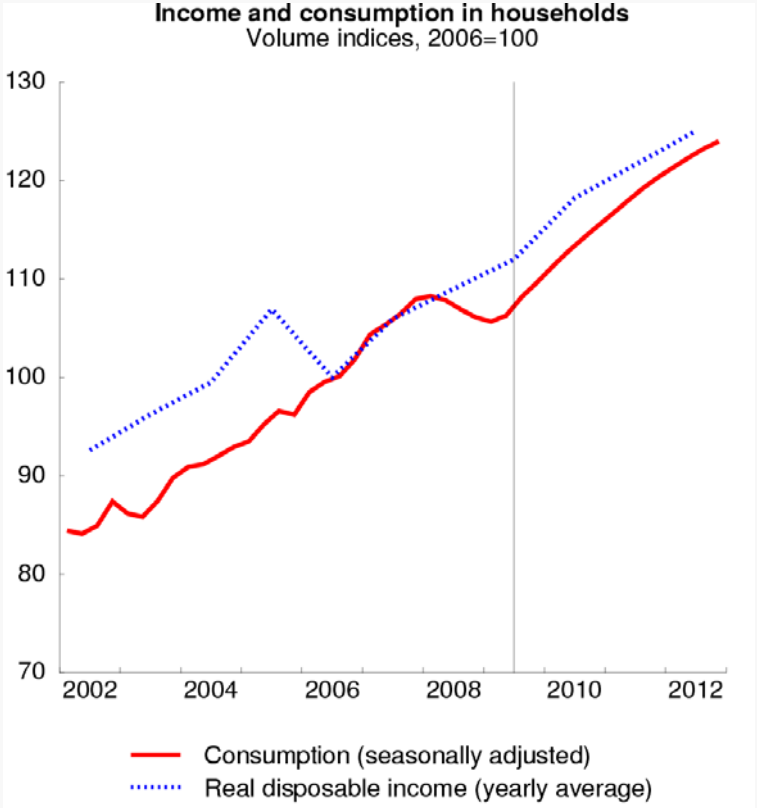


Growth rates in %	2007	2008	2009	2010	2011	2012
Consumption	3.4	3.8	5.7	3.5	3.0	2.9
Investment	7.9	5.8	12.0	10.7	3.9	-0.1

Source: Statistics Norway. f0201f01

- Fiscal stimulus of 3 per cent of GDP in 2009
  - by increased growth in investments and consumption in general government
  - Hardly any tax-cuts
- Less expansionary budget in 2010
  - Growth in general government expenditure approximately in line with economic trend growth in 2011-12
- Inflation adjusted tax-rates
- In line with strict interpretation of fiscal rule in 2012?
  - Structural oil corrected budget deficit 4-per cent of Government Pension Fund – Global
  - Government Pension Fund – Global August 2009: 135 per cent of non-petroleum GDP in 2008

Household consumption is growing

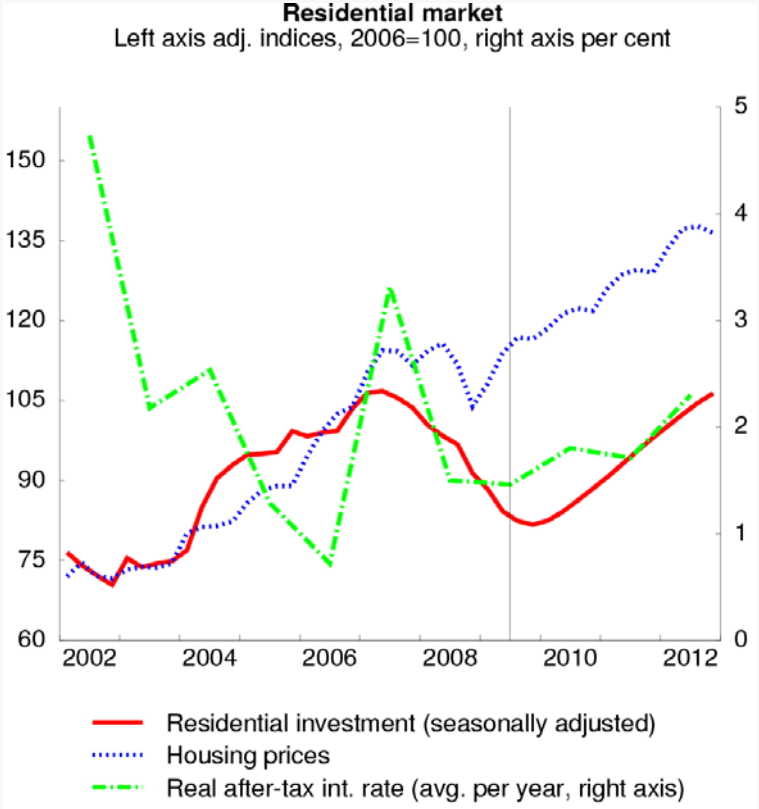


Growth rates in %	2007	2008	2009	2010	2011	2012
Disp. income (real)	5.9	2.9	2.8	5.6	2.9	2.9
Consumption	6.0	1.4	0.4	5.4	4.7	3.6
Saving ratio	0.5	2.1	4.6	4.6	2.9	2.3

Source: Statistics Norway. f0201f05

- Private consumption was falling throughout 2008 and in 2009 Q1:
  - High interest rates in 2008 q1-q3
  - Reduced wealth caused by falling house prices and crack in the stock market
    - 77% own their own dwelling
  - Income uncertainty due to rise in unemployment
  - Primarily demand for durable goods was shrinking
  - Restrictive banks
- Q2: Consumption is increasing!
- Consumption growing fast
  - Income growth
  - Low interest rates
  - Growing house prices
  - Postponed purchases
  - Less pessimism
- Saving ratio increasing from 2007 to 2009
  - From 2010 consumption and income will growing more in line

Housing prices back to peak level

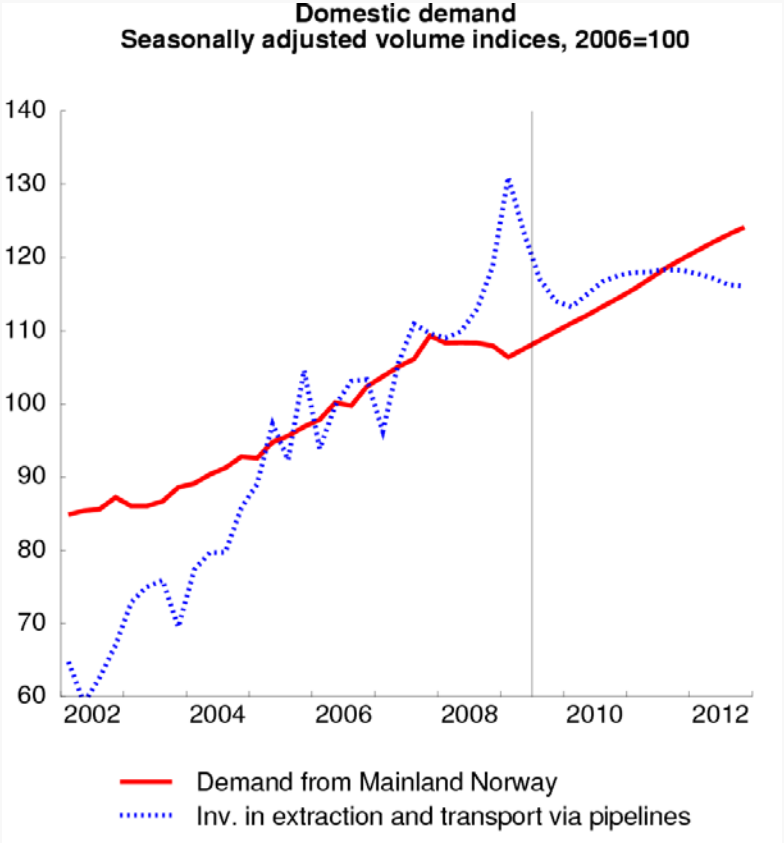


Growth rates in %	2007	2008	2009	2010	2011	2012
Housing prices	12.6	-1.1	1.9	6.1	6.2	6.4
Housing investment	5.3	-8.1	-13.6	2.1	10.6	9.7
Real after-t. int. rate	3.3	1.5	1.5	1.8	1.7	2.3

Source: Statistics Norway. f0201f06

- House prices fell by more than 10% from 2008 q2 to 2008 q4
- Most of last years fall has been picked up in the first half of 2009
  - Lower interest rates
  - Less restrictive banks
- Further growth in house prices
  - Real house prices at former top level in 2011
  - Increased interest rates will dampen the rise
- House building driven by house prices and real interest rates
  - The decline of the past 2 years turning into an upswing next year
  - 2007-top level reached in 2012

Investments in the petroleum industry remains high



Growth rates in %	2007	2008	2009	2010	2011	2012
Mainland demand	6.0	2.2	0.1	4.1	4.6	4.1
Petroleum investm.	5.5	6.6	5.5	-1.8	1.5	-1.3

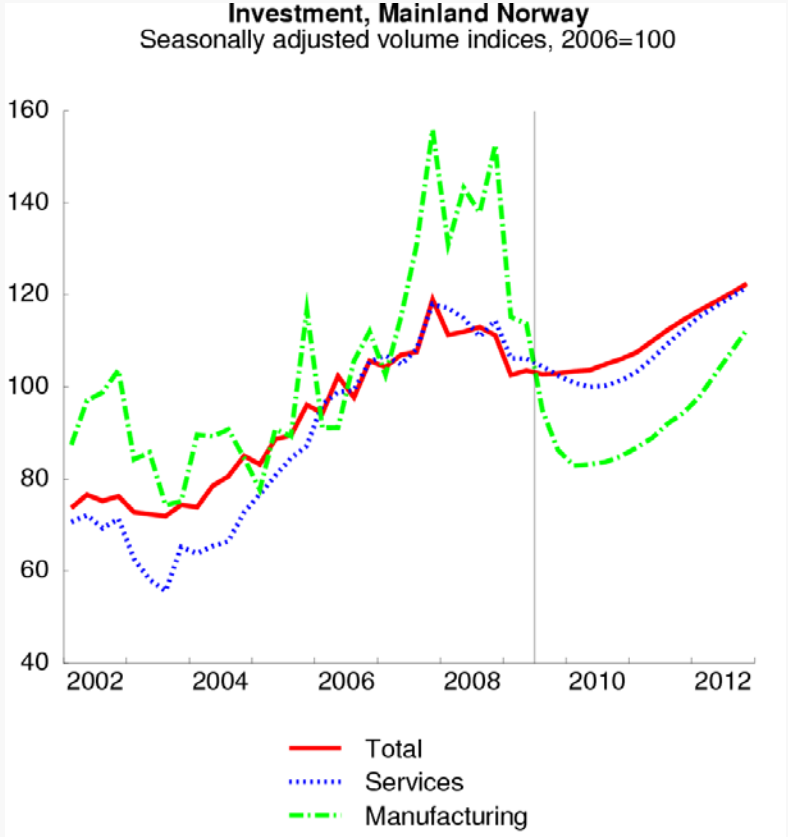
Source: Statistics Norway. f0201f07

- Reached new heights this winter
  - Decrease from first to second half of 2009
  - But at annual bases remain at historically high level
- High oil prices lead to high investment level
- Stabilizing the Norwegian economy

Oil price USD

2006	2007	2008	2009	2010	2011	2012
66,1	72,7	98,5	59,9	64,5	73,7	83,8

Fall in gross fixed capital formation, Mainland

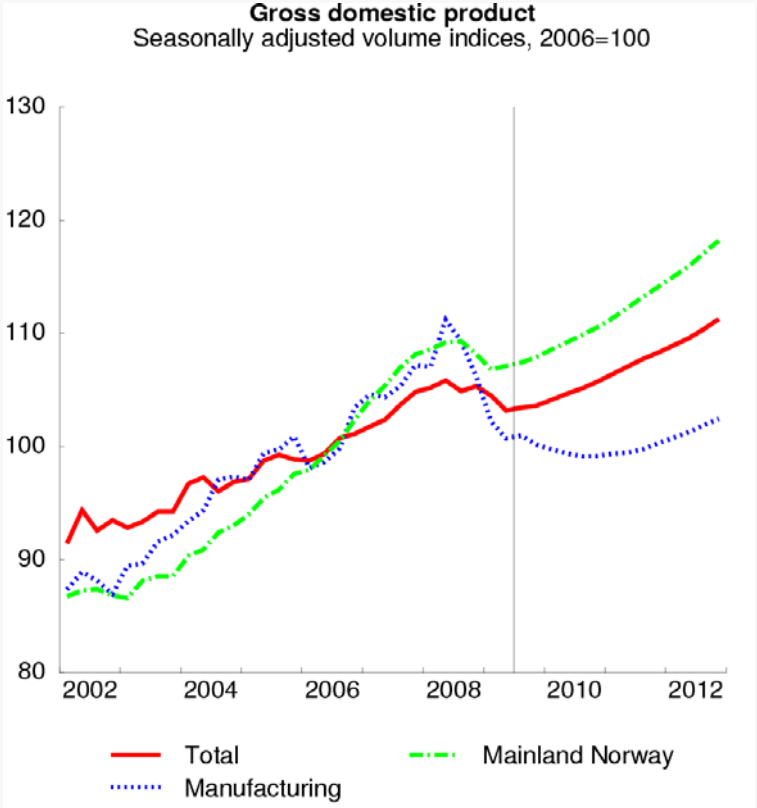


Growth rates in %	2007	2008	2009	2010	2011	2012
Mainland investment	9.3	2.4	-7.8	0.9	6.9	7.2
- Industries invest.	12.2	6.8	-12.5	-4.4	6.7	9.9

Source: Statistics Norway. f0201f08

- Mainland industries
  - fall in 2009
    - Most industries
  - Keeps falling in 2010
    - Especially in manufacturing
    - Growth in electricity production
  - Growth parallel with the cyclical upswing
- Increased investments in housing markets and high government investments push figures up in 2010

GDP Mainland is growing

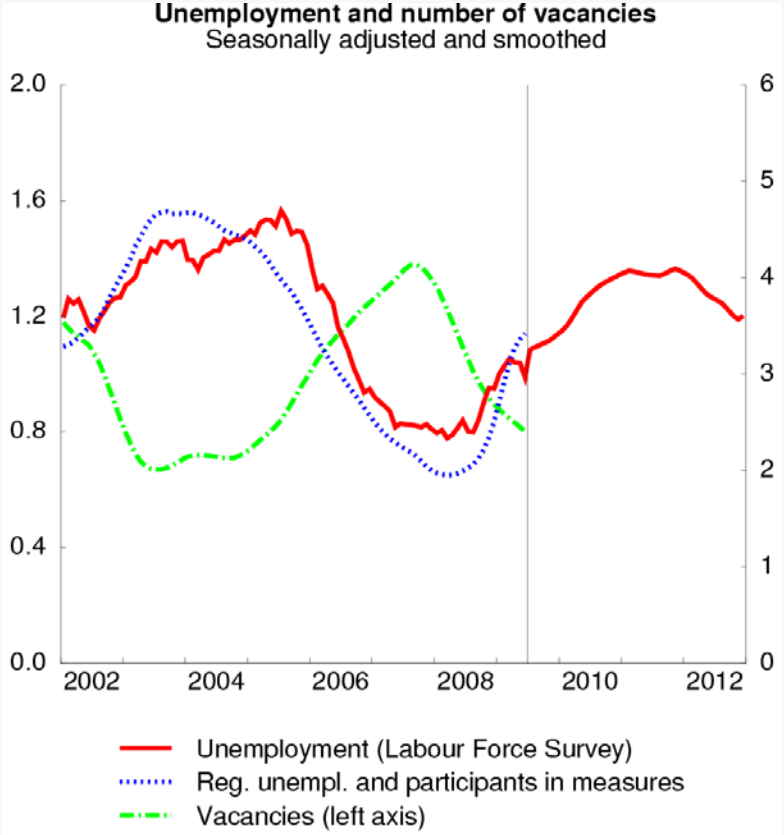


Growth rates in %	2007	2008	2009	2010	2011	2012
GDP	3.1	2.1	-1.6	1.9	2.4	2.9
GDP, Mainland	6.1	2.6	-1.2	2.1	2.9	3.3
Value added, manuf.	5.4	2.9	-5.7	-2.3	0.3	2.2

Source: Statistics Norway. f0201f11

- The cyclical downturn started in 2008 q1.
- Norway was also hit severely by the financial crises
  - GDP-M fell by 2.7% from 2008 q3 to 2009q1
  - All major industry aggregates
- Weak, but positive growth in 2009 q2 (0,3%)
  - Also in the private sector (+0,1%)
    - Value added still falling in production of goods
    - Positive growth in services
- Manufacturing industries may still face hard times
- Construction stimulated by demand from general government
  - Will also be stimulated by upturn in investments
- Growing public sector production

Growing unemployment

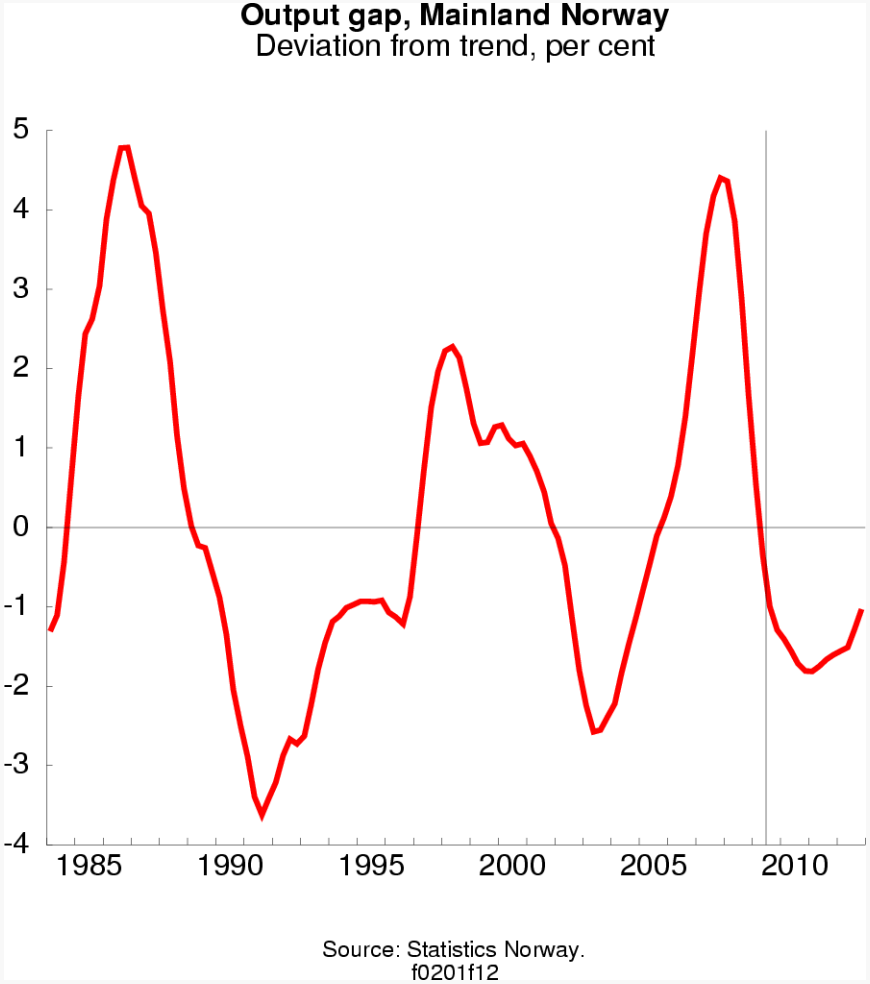


Prosent	2007	2008	2009	2010	2011	2012
Participation rate	72.8	73.9	73.0	72.2	71.7	71.6
Unemployment rate	2.5	2.6	3.3	3.9	4.0	3.8

Source: The Norwegian Labour and Welfare Service and Statistics Norway. f0201f14

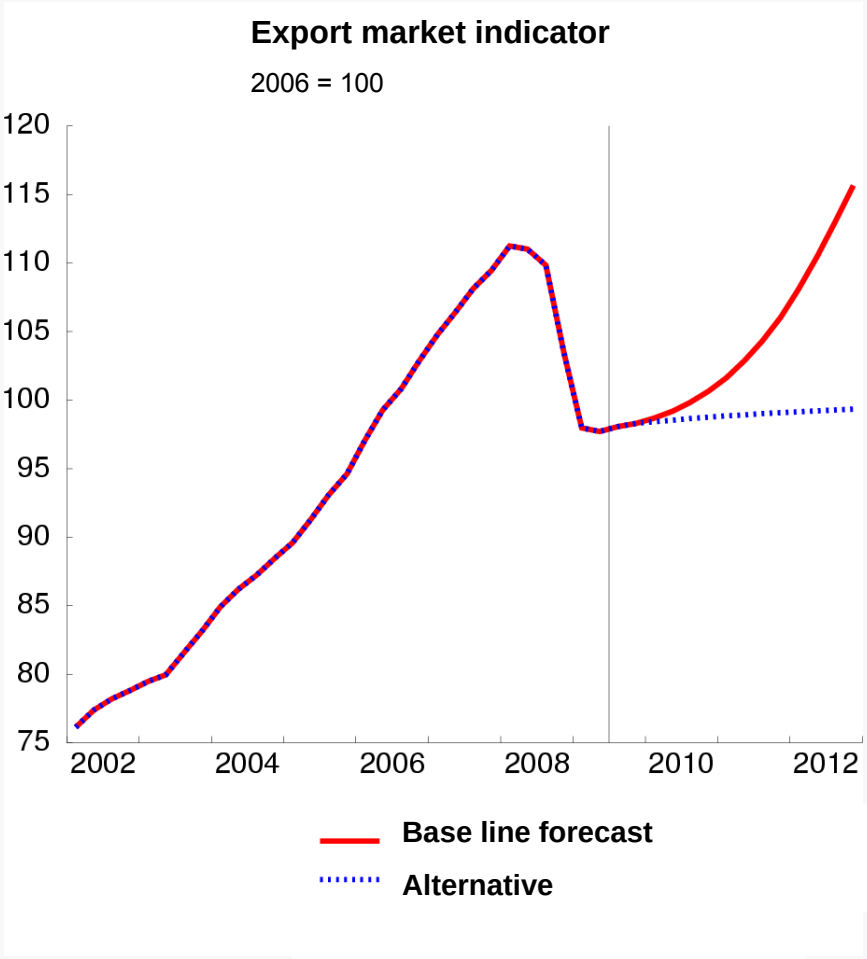
- Unemployment rate stable 2009 I according to Labour Force Survey
  - Increase of ¾ percentage point in 2008 II
- Registered unemployment still increasing, but still much lower than in 2003-2005
- Employment will fall in the times to come
- Increased unemployment during 2009 II and 2010
  - Flexibility in labour market dampens increase in unemployment
    - Migration
    - Discourage worker effects
      - Education
- Improvement in 2012
  - Response from the labour market dampens unemployment reductions

Norway in recession



- The recession in Norway is smaller than in the early 2000
  - In contrast to most of the OECD countries
- Because
  - Oil → Public financial situation → Powerful stimulus from fiscal policy
  - High interest rates before the recession took off
    - Reduced interest rates powerful in Norway
      - Floating lending rates dominates in households (83,4%)
      - 77% own their own dwelling
  - Demand from the petroleum sector a stabilising factor (2009: 15% of GDP-M)
  - Public sector constitutes of a large part of the economy (2009: val.add. 20%, demand from general government 34% of GDP-M)
  - Exchange rate reaction of the credit crises
  - Norwegian Banks not hit hardest and helped by effective public actions
- …But impulses from international economy can worsen…

Consequences of a deeper international recession



- Simulation experiment
  - No change in fiscal policy

Some assumptions

Divergence from baseline in %

	2010	2011	2012
Export market indicator	-1,0	-4,6	-11,2
CPI, euro	-0,5	-1,5	-3,2
Money market rates, euro	-0,7	-1,6	-2,7
Oil price, USD	-4,5	-13,7	-23,8

Effects of a deeper international recession

Divergence from baseline in %

	2010	2011	2012
Consumption	0	0,5	1,3
Gross fixed capital formation	-0,5	-0,7	-0,4
Manufacturing	-3	-4,6	-5,1
Housing	0	0,3	1,6
Export, trad merch	-6	-10,5	-16
GDP Mainland	-0,9	-1,3	-1,5
Manufacturing	-3,4	-5,6	-7,4
Employment, 1000 pers.	-14	-23	-31
Unemployment, rate p.p.	0,3	0,4	0,6
Wage rates	-1	-2,8	-5,1
CPI	-0,7	-1,7	-3,0
Export prices, trad. com.	-12,1	-17,5	-17,7
House prices	-0,7	-0,7	0,5
Real income	0	0,4	0,6
Money market rate	-1,3	-2,7	-4,3
Exchange rate	1	1,9	4,5

- Export sectors harder hit
  - Reduced interest rates and weaker exchange rate dampens the effects of reduced international demand
- Reduced production and increased unemployment
- Expansive monetary policy increases households demand
  - Increased household's real income in spite of higher unemployment

Fighting the recession: Tax cut or increased demand from public sector

Simulation experiment

A. Increased demand from general government
   1. Public employment: +7,4 %
   2. Public investments: +22 %

B. Tax cuts
   1. Pay roll taxes, -22 % (14,1→11,0)
   2. VAT, -12 pst. (25,0 → 22,0)
   3. Income tax reduction

Initial budget impuls: 20 bill. kroner

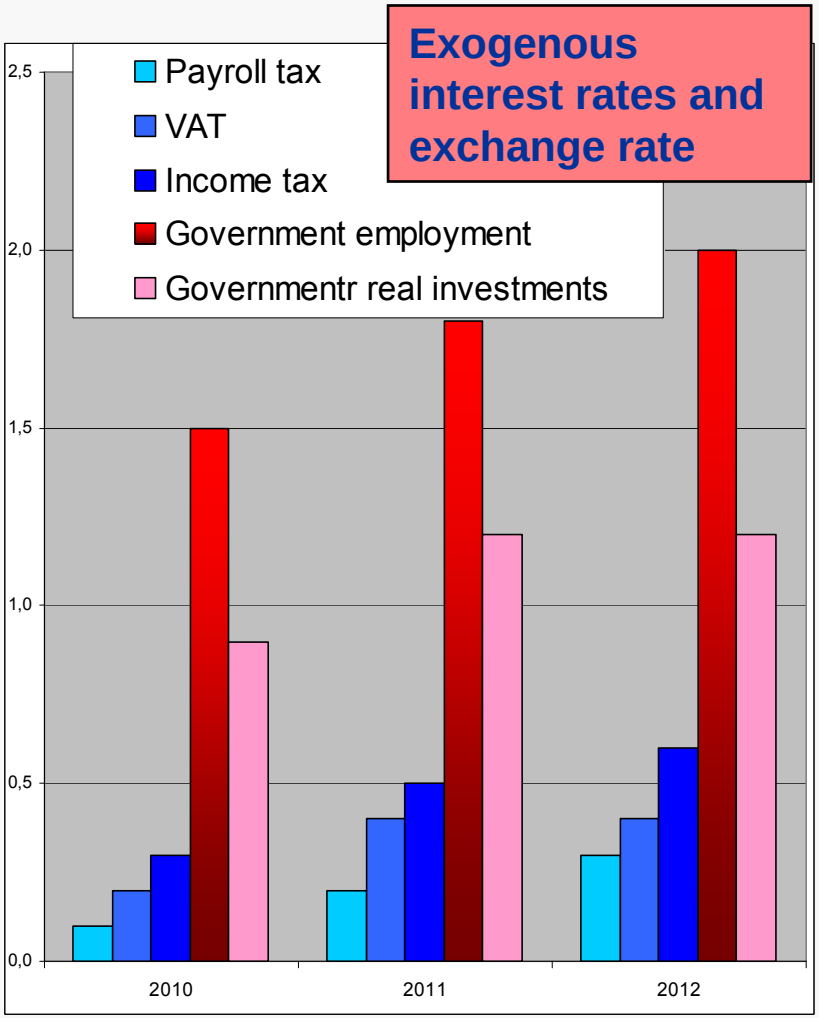
- Aprox. 1% of GDP Mainland

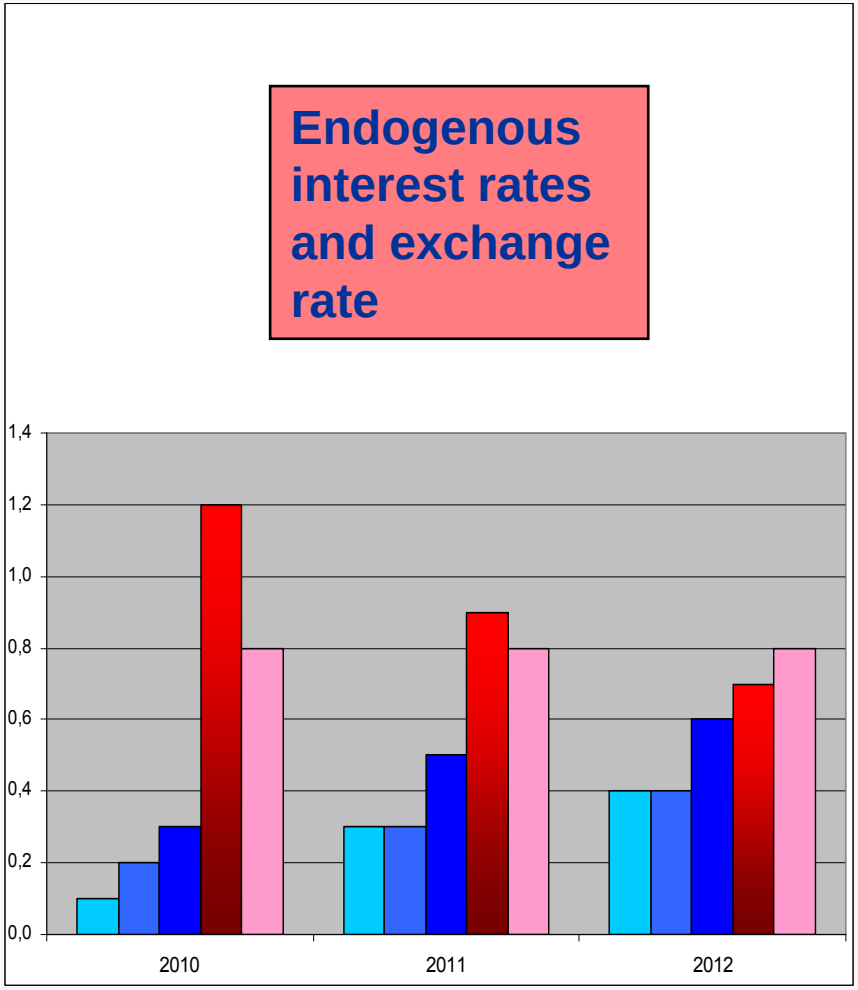
- ”Permanent” shift for 3 years in real terms - 2010-2012

Do we trust the model in this situation?

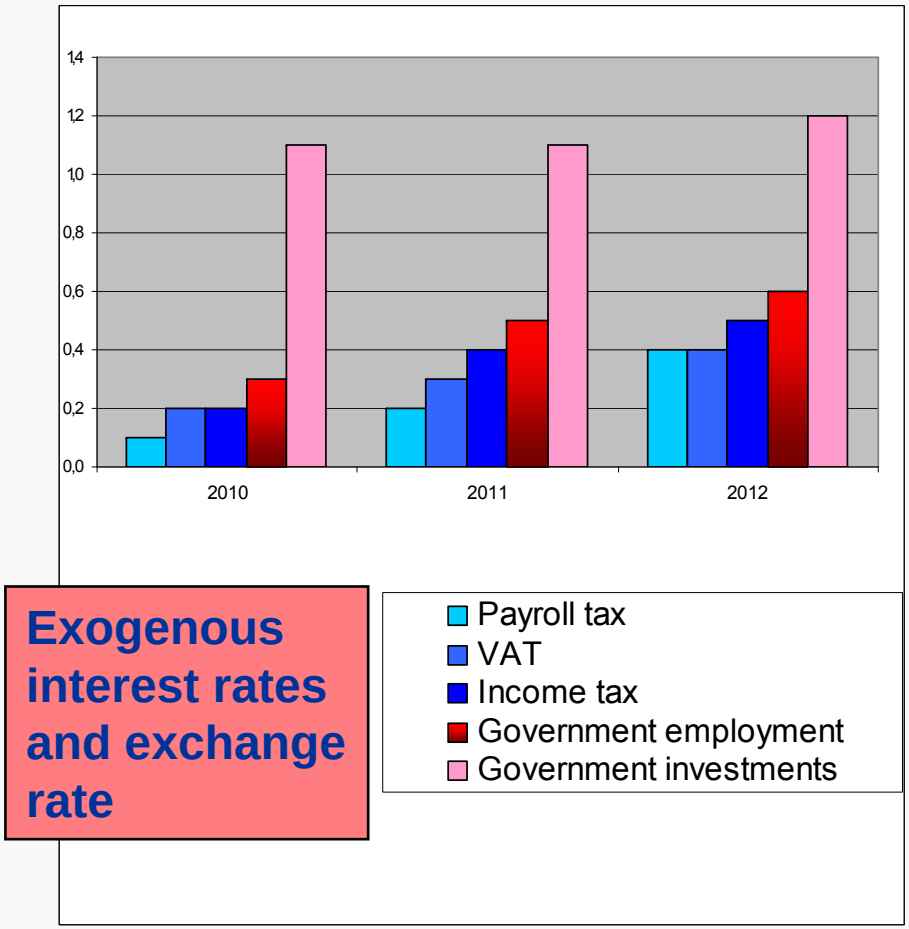
- Exchange rates
  - The model can’t explain the weakening of NOK in 2008 q4
- Monetary policy response
  - The model tells us that the stimulating fiscal policy will be met by offsetting movements in signal rates (nb compared with the base line scenario)
- Solution:
  - 2 versions of the model
    - Exogenous exchange rate and interests
    - Endogenous exchange rate and interests

Results: GDP Mainland, effects in % difference from base line scenario

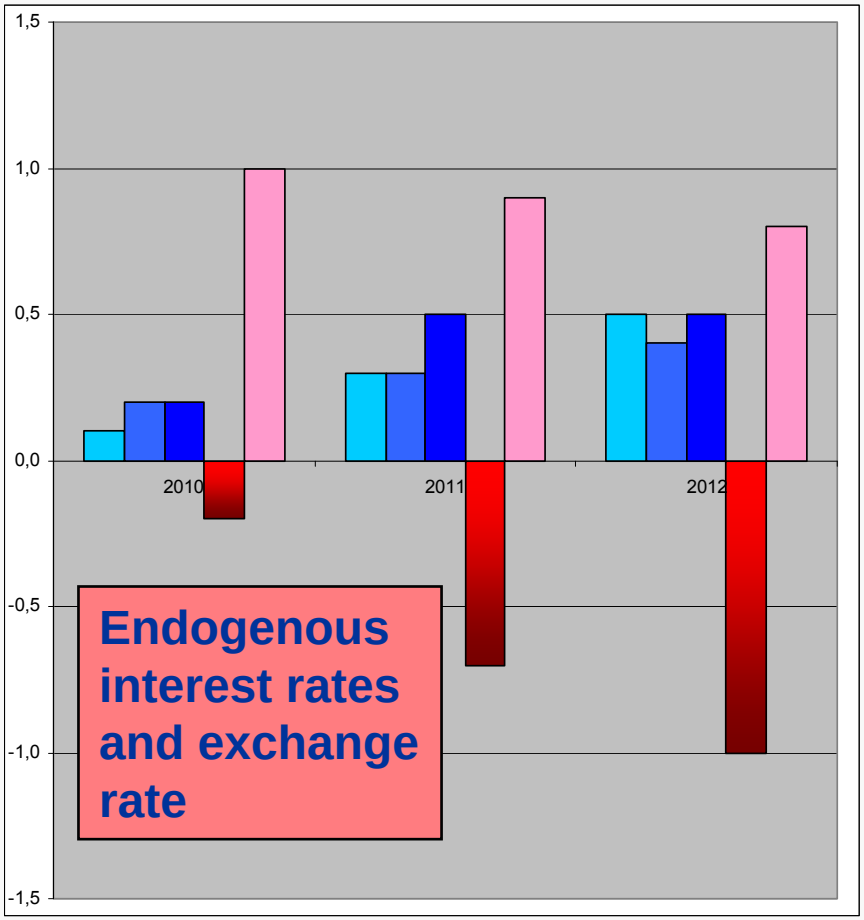




Results: GDP Private sector Mainland, effects in % difference from base line scenario

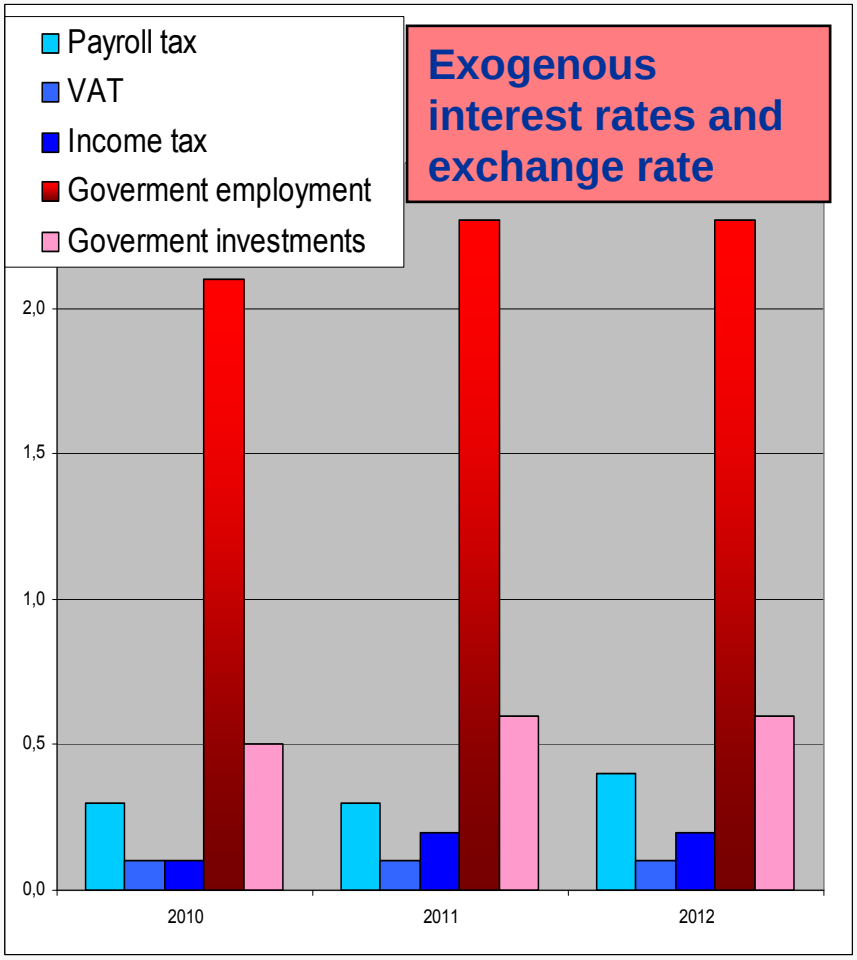


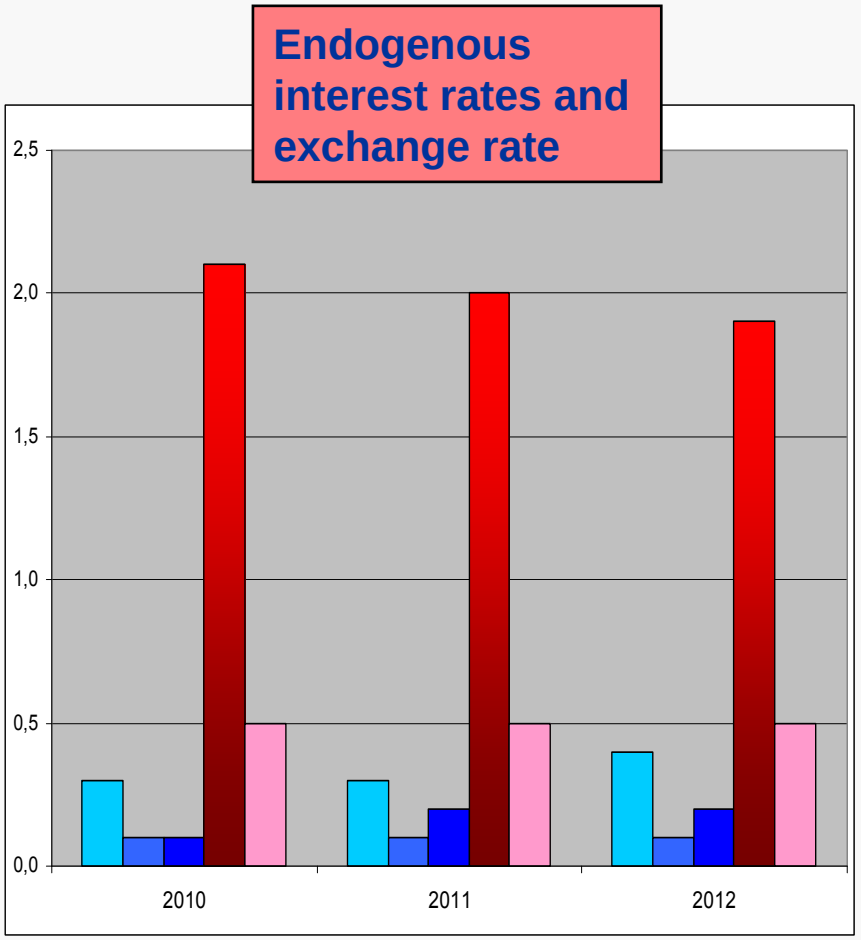
Exogenous interest rates and exchange rate



Endogenous interest rates and exchange rate

Results: Employment, effects in % difference from base line scenario





Conclusions

- Increased **demand from general government** stimulates production and employment much more than **tax cuts**.
- Increased **government employment**:
  - Most effective – especially in the labour market but also wrt. total GDP
  - BUT Monetary policy responses may decrease activity in private sector and then increased **government employment** may be the worst policy alternative – is anyway much less effective than **general government demand for goods and services** and not much better than **tax cuts**.
- Reduced **payroll tax** gives the strongest effects of the **tax cutting** policy measures

Why?

- Increased **government employment** works per assumption direct in the labour market. Higher real wage, employment and workforce → higher income in households. Thus increases inflation → tighter monetary policy.

- Increased **general government demand for goods and services** stimulates production in private sector directly. Increases also imports.

- High marginal saving propriety dampens the effects of **reduced income tax and reduced VAT**. Much of the increased demand will be directed to import. Stimulates labour supply – decreases the reduction in unemployment.

- The short term effect of reduced **payroll tax** is increased profitability – it takes time before the increased cost competitiveness increases production. Relative prices of factor inputs changes in favour of employment