

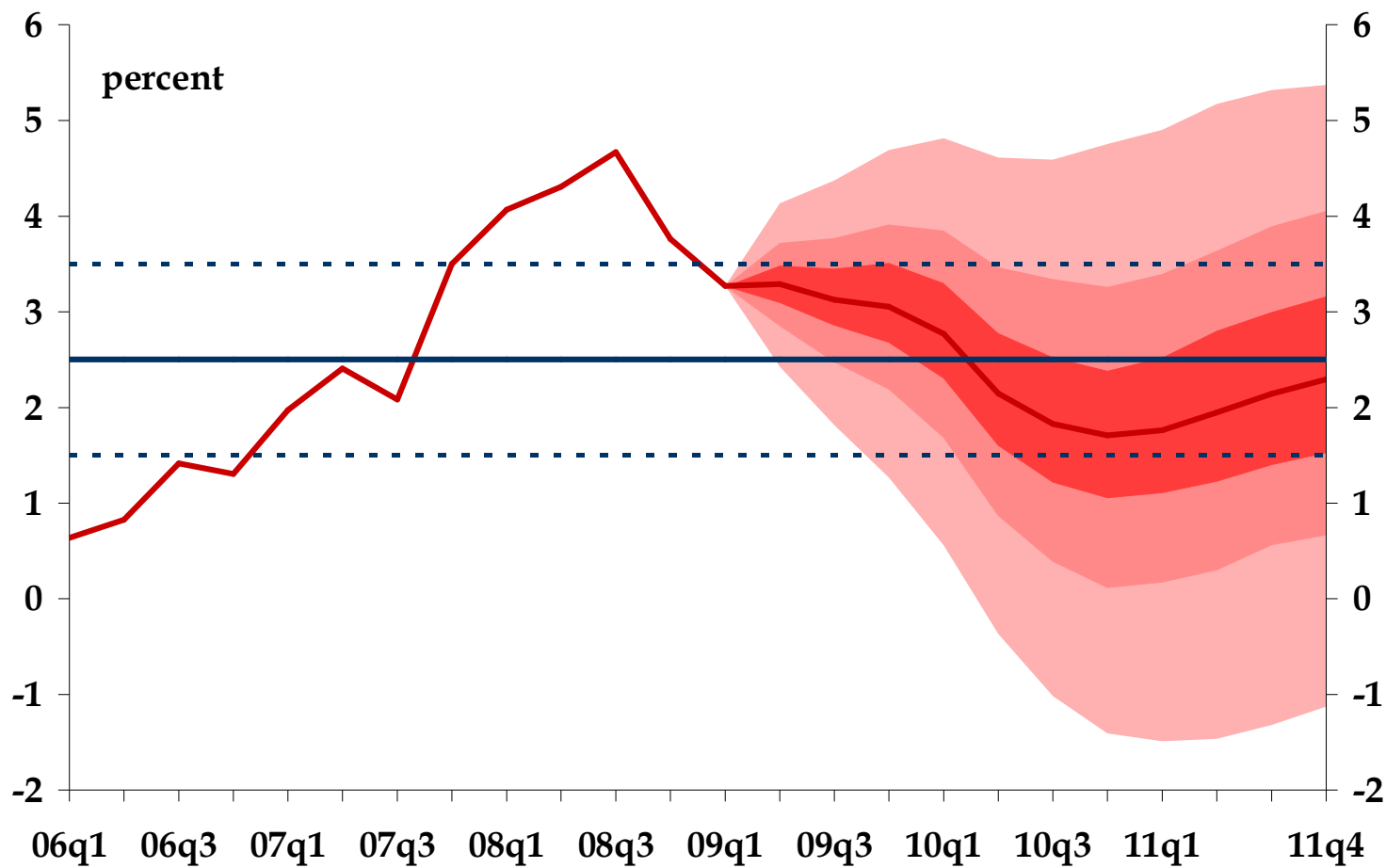
Economic Institute

Inflation projection
of the National Bank of Poland
based on the NECMOD model

June 2009

Inflation projection – June 2009

- I PROJECTION
- II CHANGES IN THE PROJECTION
- III UNCERTAINTY



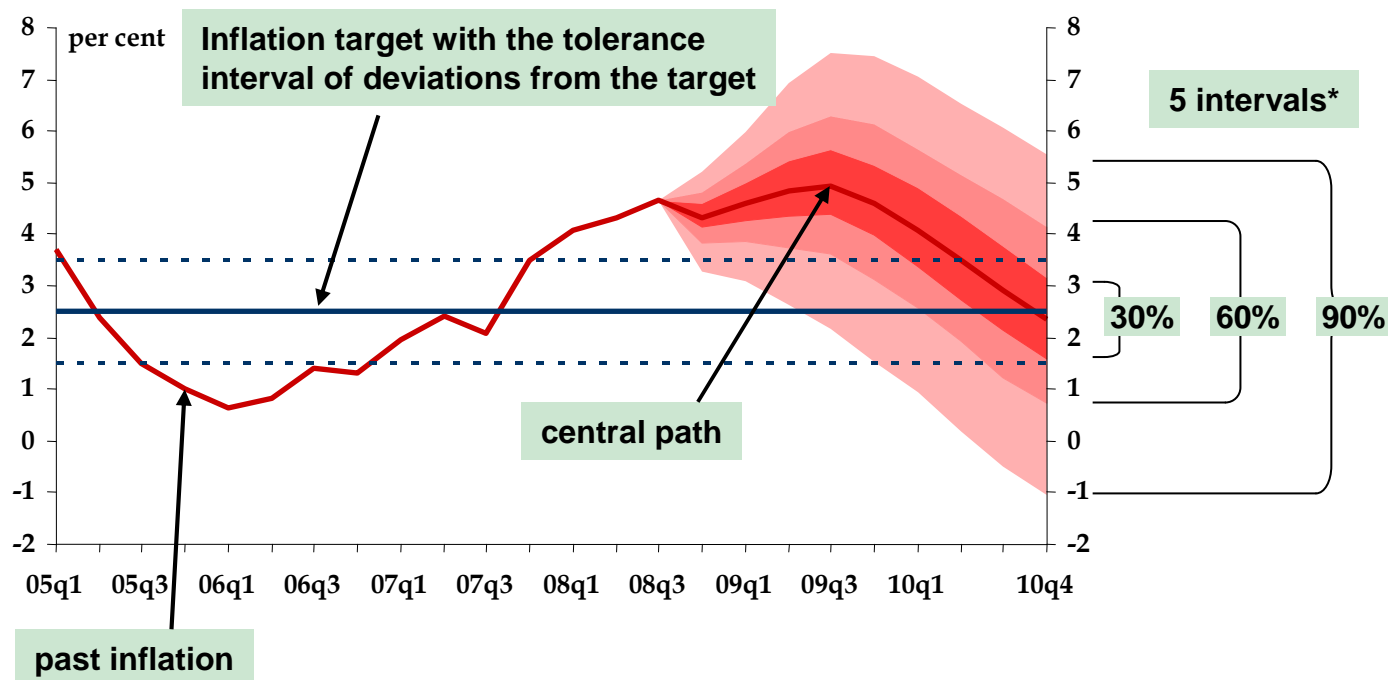
Construction of fan chart

I PROJECTION

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

- Uncertainty of inflation and GDP projection is estimated on the basis of past forecasting errors from the ECMOD/NECMOD model and on the basis of risk assessment of forecasts of selected exogenous variables.



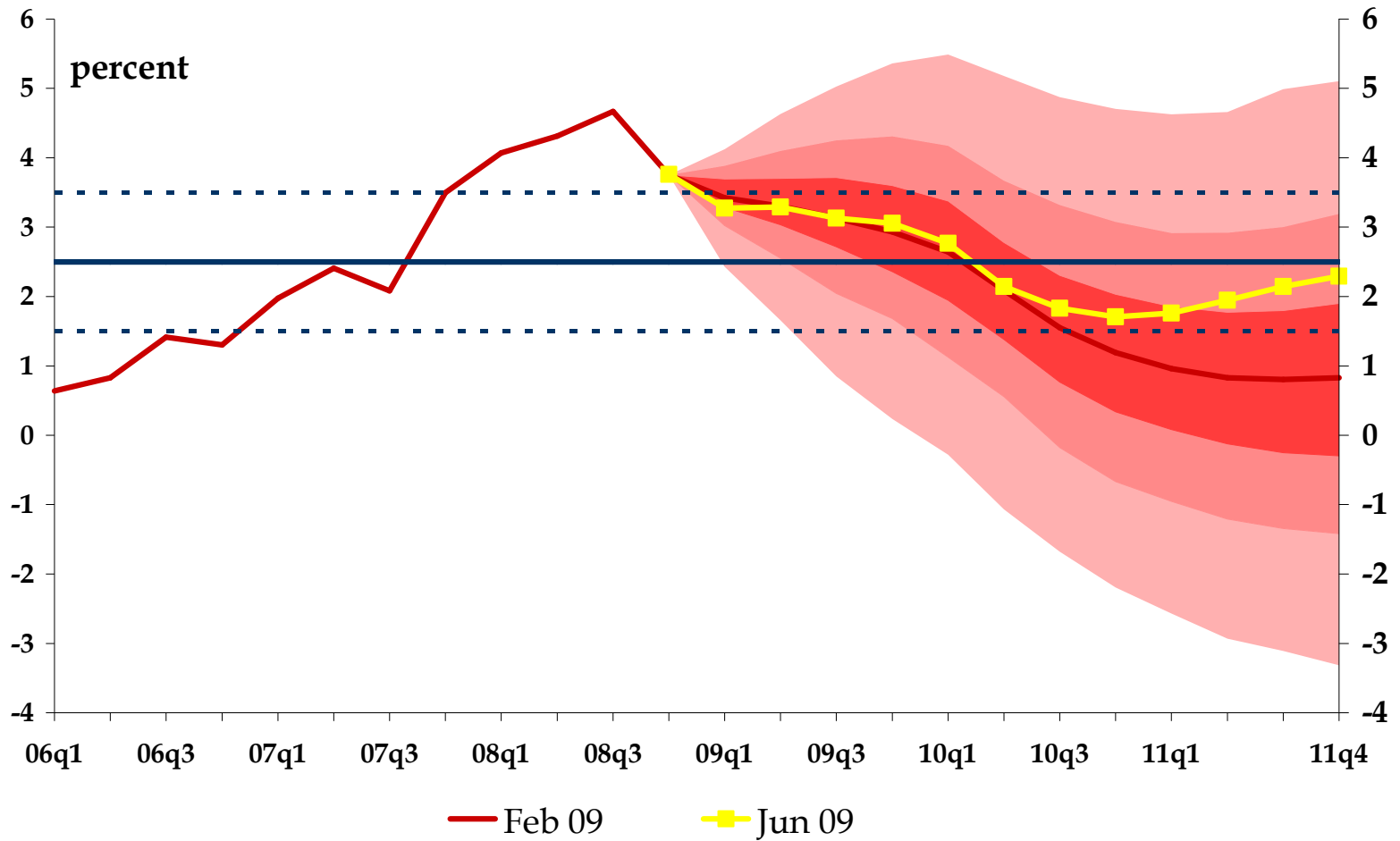
*Intervals have been chosen to ensure that the probability of inflation running below the lower limit of the tolerance interval equals the probability of inflation running above the upper limit of the tolerance range.

June projection in comparison to February projection: CPI inflation

I PROJECTION

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

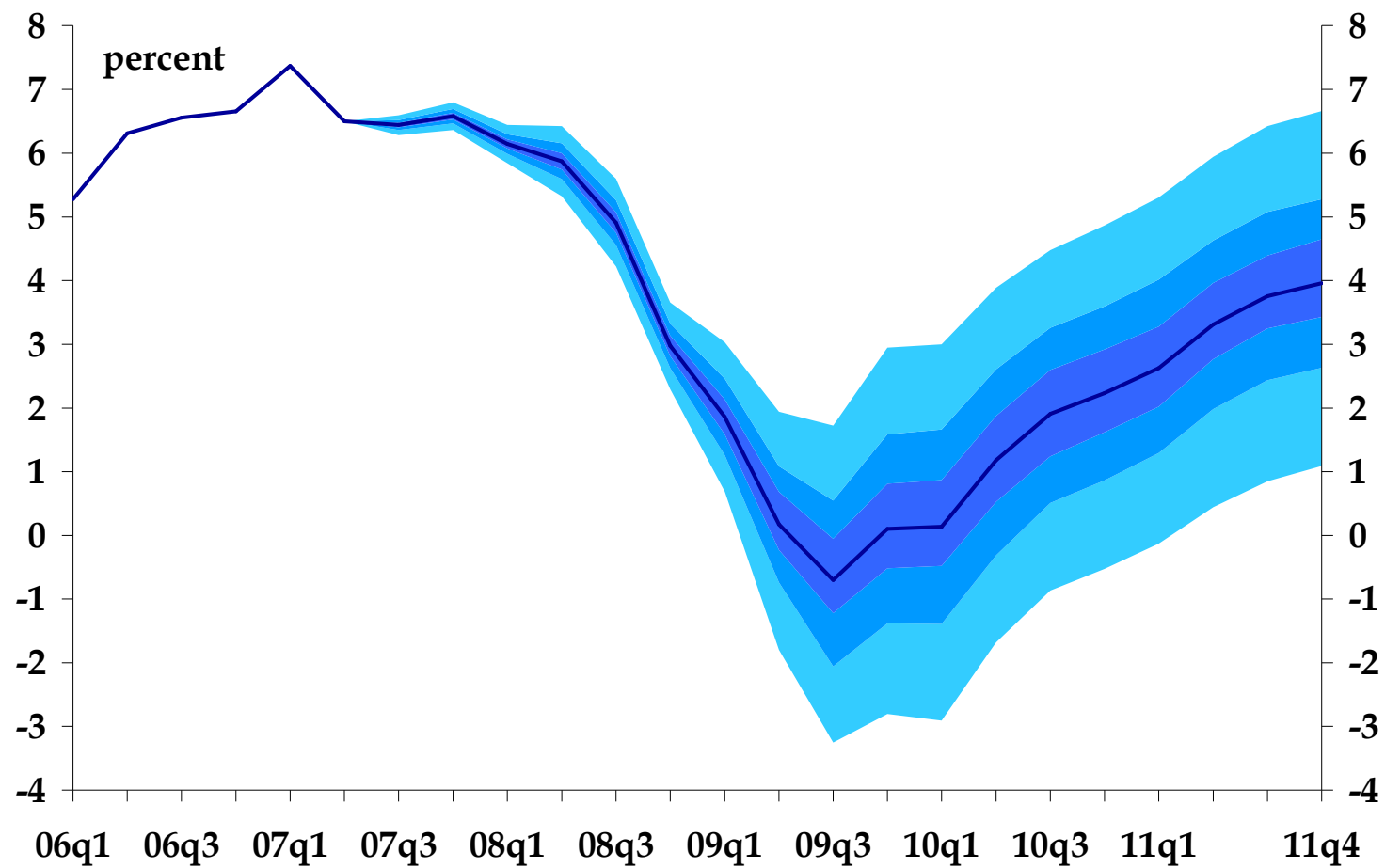


GDP projection – June 2009

I PROJECTION

II CHANGES IN
THE PROJECTION

III UNCERTAINTY

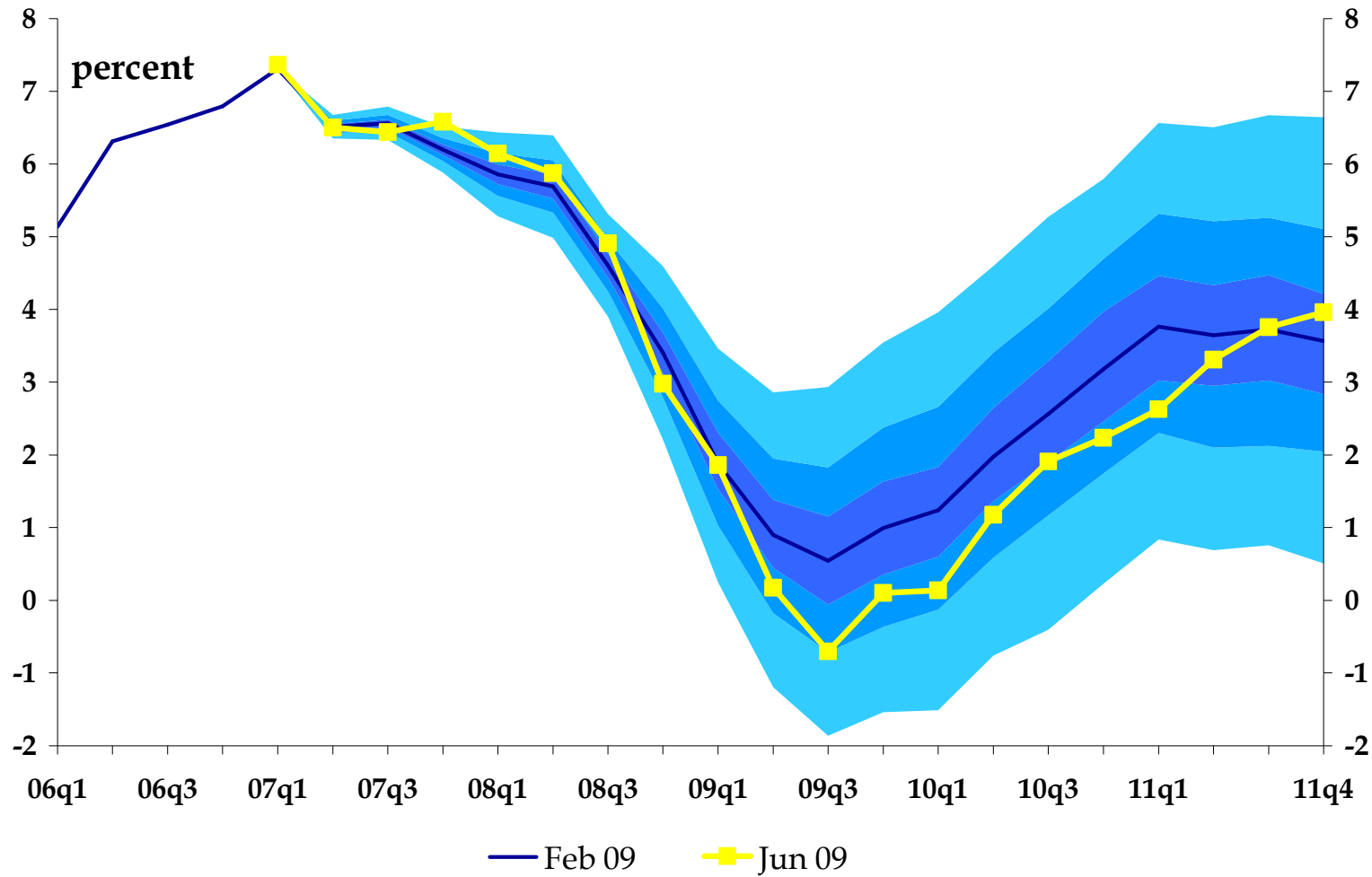


June projection in comparison to February projection: GDP

I PROJECTION

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY



I PROJECTION

a) Assumptions

b) Starting point

c) Projection for
2009-2011

II CHANGES IN
THE PROJECTION

III UNCERTAINTY

CENTRAL PROJECTION

Assumptions

- Growth abroad
- Price growth abroad
- Interest rates abroad
- Energy commodity price index
- Agricultural commodity price index

Growth abroad

(markedly lower till 2011 Q1)

I PROJECTION

a) Assumptions

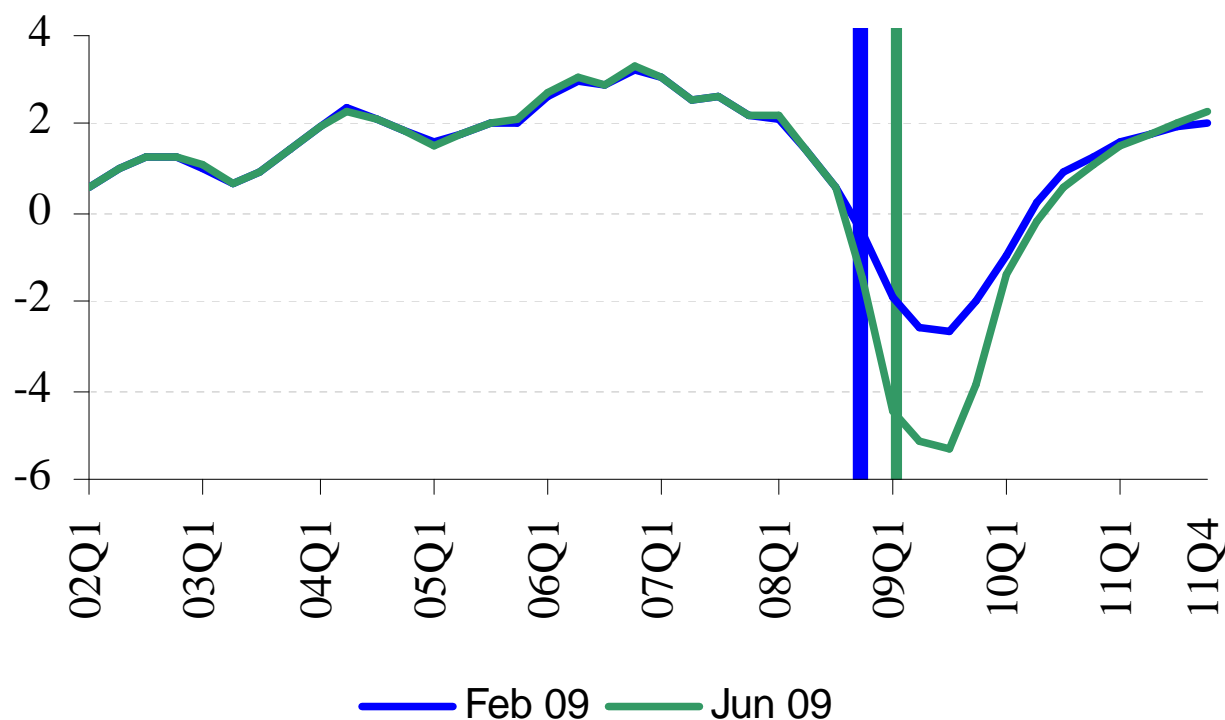
b) Starting point

c) Projection for 2009-2011

II CHANGES IN THE PROJECTION

III UNCERTAINTY

External GDP (y-o-y) (%)



In NECMOD model, the foreign sector is represented by three economies (with weights, respectively):

- **euro area** (87.8%)
- **United Kindgom** (7.2%)
- **United States** (5.0%)

Price growth abroad

(lower between 2009 Q4 and 2010 Q3)

I PROJECTION

a) Assumptions

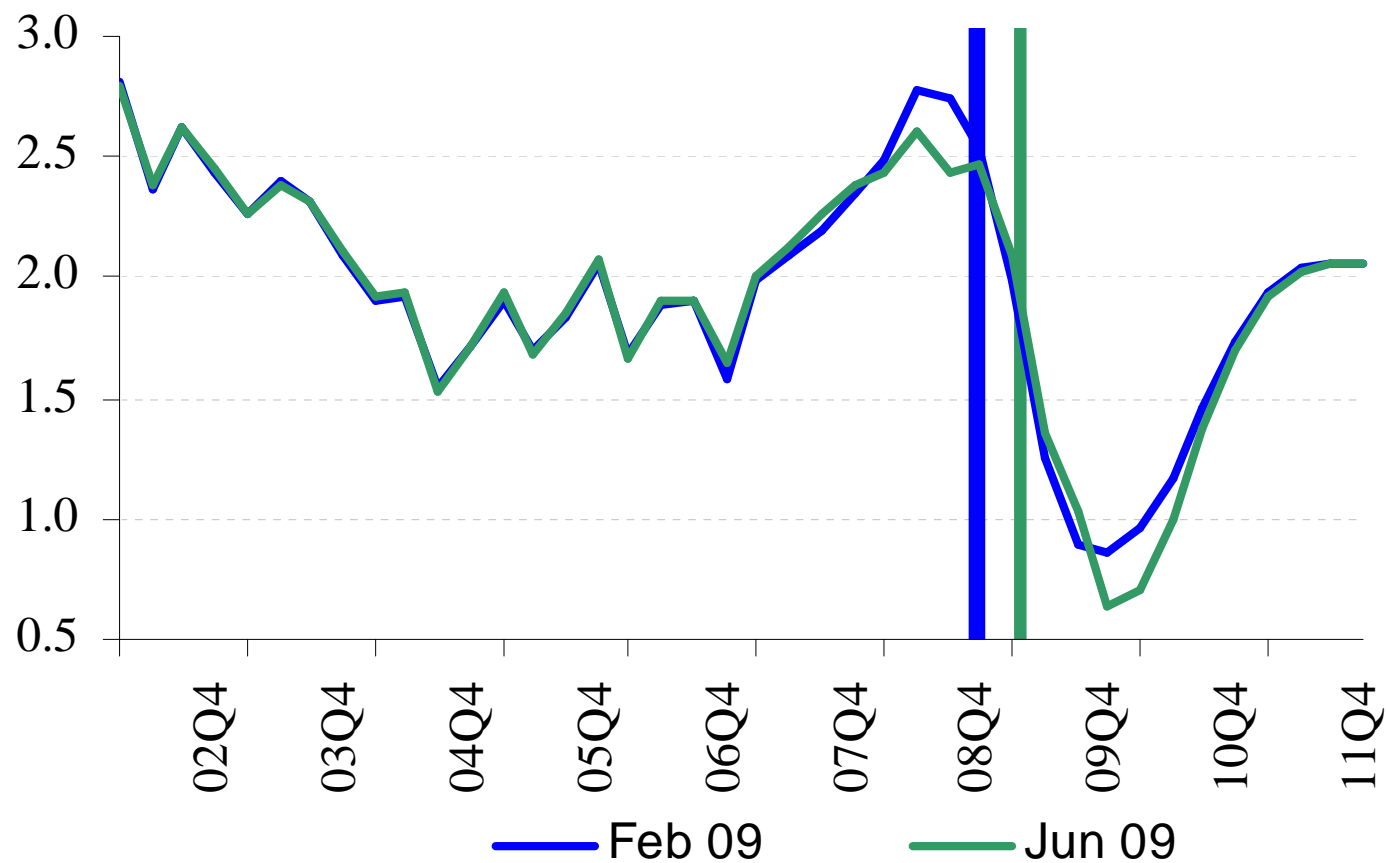
b) Starting point

c) Projection for 2009-2011

II CHANGES IN THE PROJECTION

III UNCERTAINTY

External value added deflator (y-o-y) (%)



Interest rates abroad (lower)

I PROJECTION

a) Assumptions

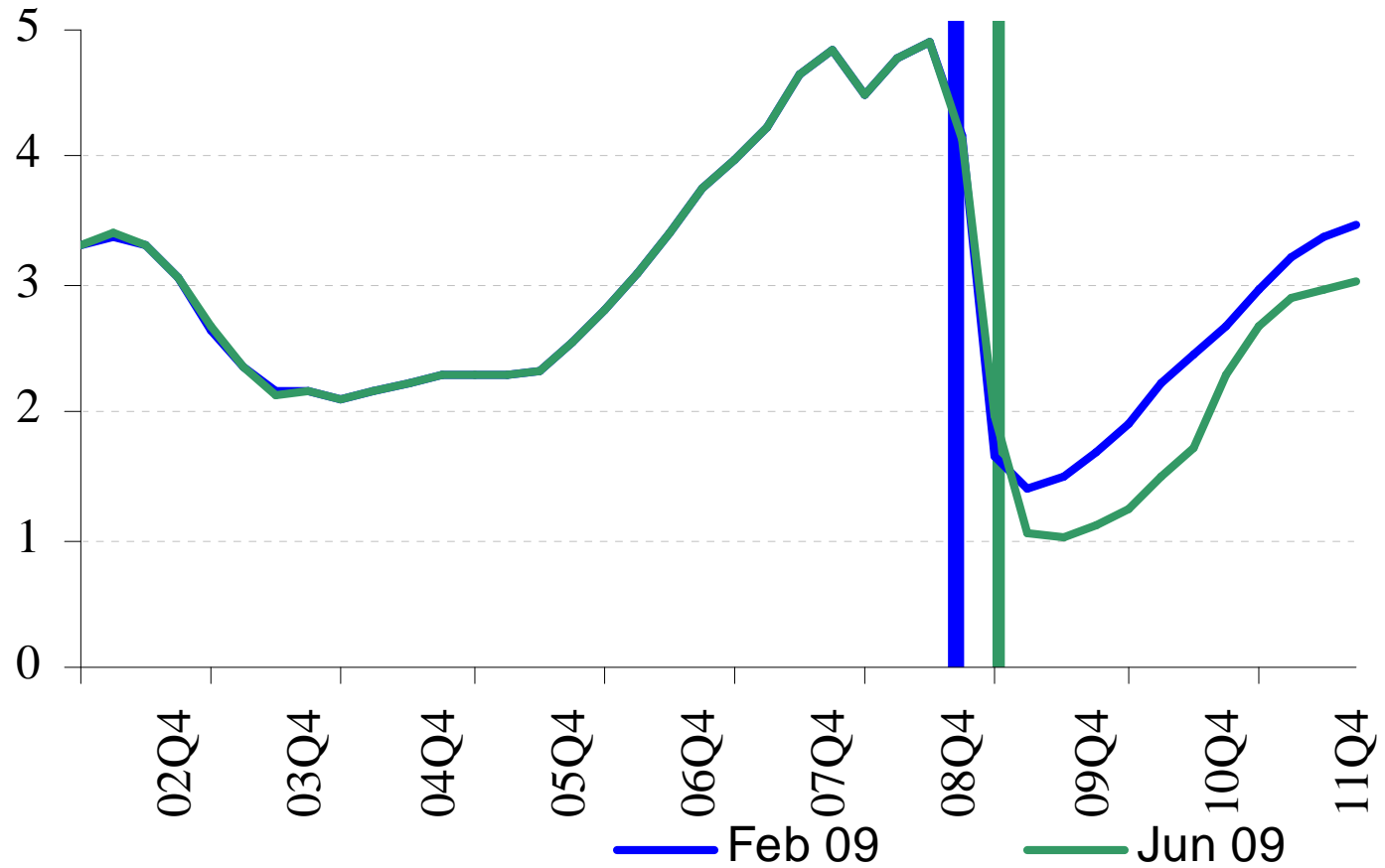
b) Starting point

c) Projection for
 2009-2011

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

External 3M interest rate



Energy commodity price index*

(lower in the short horizon)

I PROJECTION

a) Assumptions

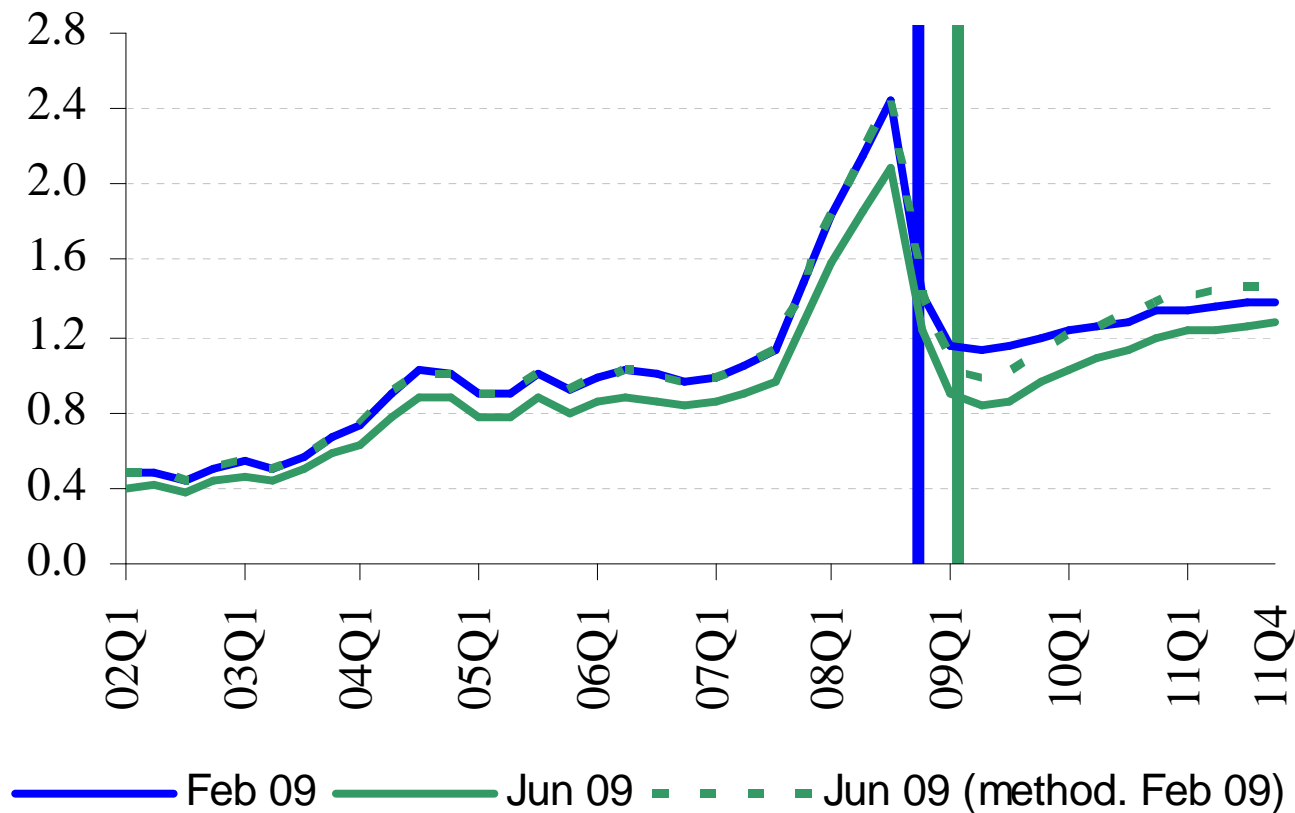
b) Starting point

c) Projection for
 2009-2011

**II CHANGES IN
 THE PROJECTION**

III UNCERTAINTY

Energy commodity price index



* Global index of energy prices includes prices of coal, crude oil and natural gas.

Agricultural commodity price index * (incomparable[†])

I PROJECTION

a) Assumptions

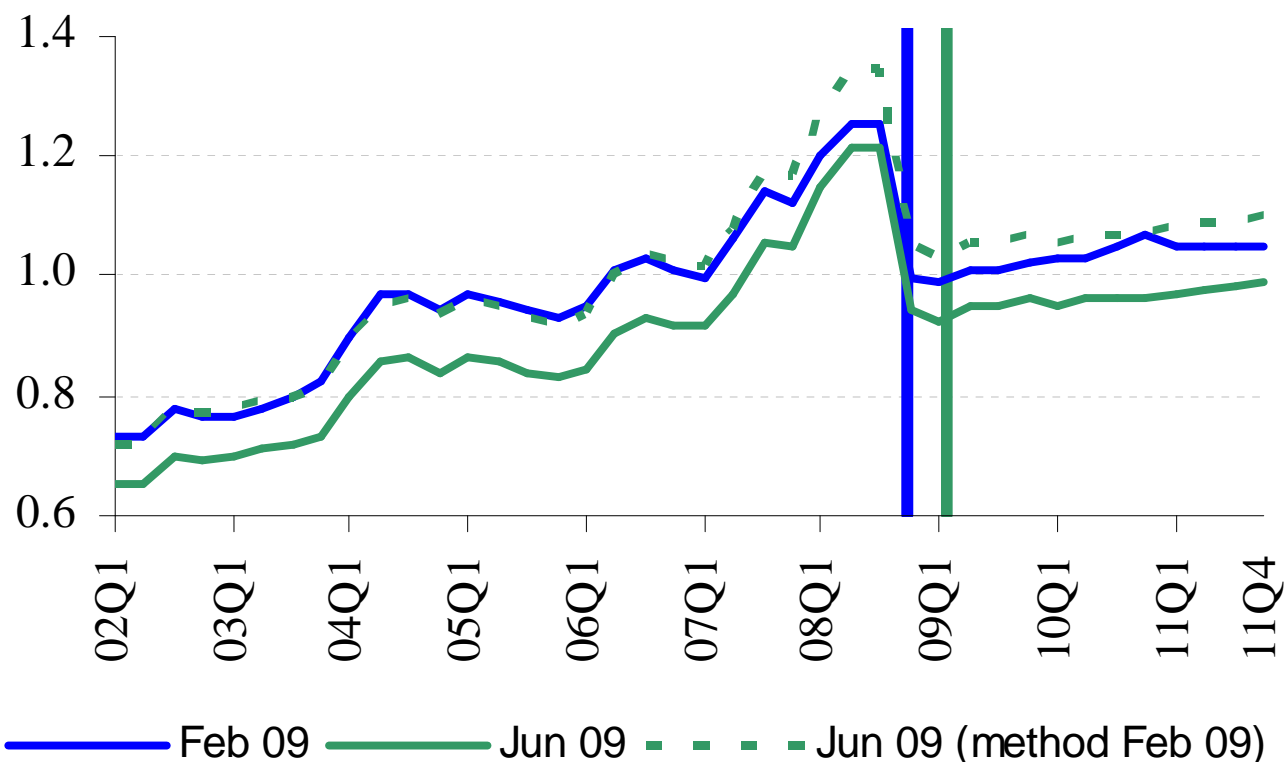
b) Starting point

c) Projection for 2009-2011

II CHANGES IN THE PROJECTION

III UNCERTAINTY

Agricultural commodity price index



•Global index of agricultural commodity prices consists of prices of wheat, pork, beef, poultry, fish, seed oil, sugar, oranges, bananas and index of beverages.

[†] Index weights represent the structure of consumer spending (CPI basket).

– June projection consistent with 2009 structure, February projection consistent with 2008 structure.

I PROJECTION

a) Assumptions

b) Starting point

- GDP
- Labour market
- Inflation

c) Projection for
2009-2011

**II CHANGES IN
THE PROJECTION**

III UNCERTAINTY

Starting point

of June projection compared to February projection

- GDP and its components
- Labour market
- Inflation

GDP and its components – starting point*

I PROJECTION

a) Assumptions

b) Starting point

• **GDP**

• Labour market

• Inflation

c) Projection for
 2009-2011

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

	08Q4	09Q1	
		IE estimate (22.05)	GUS [†] estimate (29.05)
GDP (y-o-y) (%)	2,9 (2,9)	1.6 (1.9)	0.8
Domestic demand (y-o-y) (%)	3,5 (3,0)	0.9 (1.0)	-1.0
Individual consumption (y-o-y) (%)	5,3 (4,4)	3.2 (4.1)	3.3
Public consumption (y-o-y) (%)	14,1 (1,0)	3.0 (0.0)	6.1
Gross fixed capital formation (y-o-y) (%)	4,6 (0,3)	-0.5 (-0.8)	1.2
Exports (y-o-y) (%)	-0,7 (1,6)	-10.2 (5.1)	-14.6
Imports (y-o-y) (%)	1,0 (1,9)	-11.1 (2.9)	-17.6
Contribution of net exports (percentage points)	-0,7 (-0,2)	0.8 (0.8)	1.8

* Values from the February 2009 projection are given in brackets.

Indicators whose value is higher than in February projection are marked in green colour whereas indicators whose value is lower than in February projection are marked in red colour.

† Central Statistical Office

Labour market – starting point*

I PROJECTION

a) Assumptions

b) Starting point

• GDP

• Labour market

• Inflation

c) Projection for
2009-2011

II CHANGES IN THE PROJECTION

III UNCERTAINTY

	08Q4	09Q1
ULC (y-o-y) (%) [†]	4.9 (2.9)	3.9 (3.6)
Non-agricultural ULC (y-o-y) (%) [†]	5.4 (3.4)	4.2 (3.7)
Labour productivity (y-o-y) (%) [†]	2.5 (3.4)	2.5 (3.0)
Non-agricultural labour productivity (y-o-y) (%) [†]	2.1 (2.9)	2.3 (2.8)
Wages (y-o-y) (%)	7.7 (8.4)	7.2 (6.5)
LFS employment (y-o-y) (%) [†]	0.5 (0.0)	-0.7 (-1.1)
Non-agricultural employment (y-o-y) (%) [†]	0.9 (0.6)	-0.4 (-1.0)
LFS unemployment rate (%)	6.9 (7.6)	7.9 (8.9)
Participation rate (%)	54.4 (54.3)	54.7 (54.5)
Population (y-o-y) (%) [†]	-2.3 (-1.6)	-2.1 (-0.9)

* Values from the February 2009 projection are given in brackets.

Indicators whose value is higher than in February projection are marked in green colour whereas indicators whose value is lower than in February projection are marked in red colour.

[†] Based on LFS adjusted data

Inflation – starting point*

I PROJECTION

a) Assumptions

b) Starting point

- GDP
- Labour market

• Inflation

c) Projection for
 2009-2011

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

	08Q4	09Q1
CPI inflation (y-o-y) (%)	3.8 (3.8)	3.3 (3.4)
Core inflation (y-o-y) (%)	2.9 (2.9)	2.3 (3.3)
Food price inflation (y-o-y) (%)	3.4 (3.4)	3.8 (2.4)
Energy price inflation (y-o-y) (%)	7.8 (7.8)	6.0 (5.6)

* Values from the February 2009 projection are given in brackets.

Indicators whose value is higher than in February projection are marked in green colour whereas indicators whose value is lower than in February projection are marked in red colour.

I PROJECTION

a) Assumptions

b) Starting point

**c) Projection for
2009-2011**

- GDP
- Labour market
- Exchange rate
- Inflation

II CHANGES IN
THE PROJECTION

III UNCERTAINTY

Projection for the years 2009-2011

- GDP and its components
- Labour market
- Exchange rate
- Inflation

Investment outlays

(lower in short horizon)

I PROJECTION

a) Assumptions

b) Starting point

**c) Projection for
 2009-2011**

• **GDP**

• Labour market

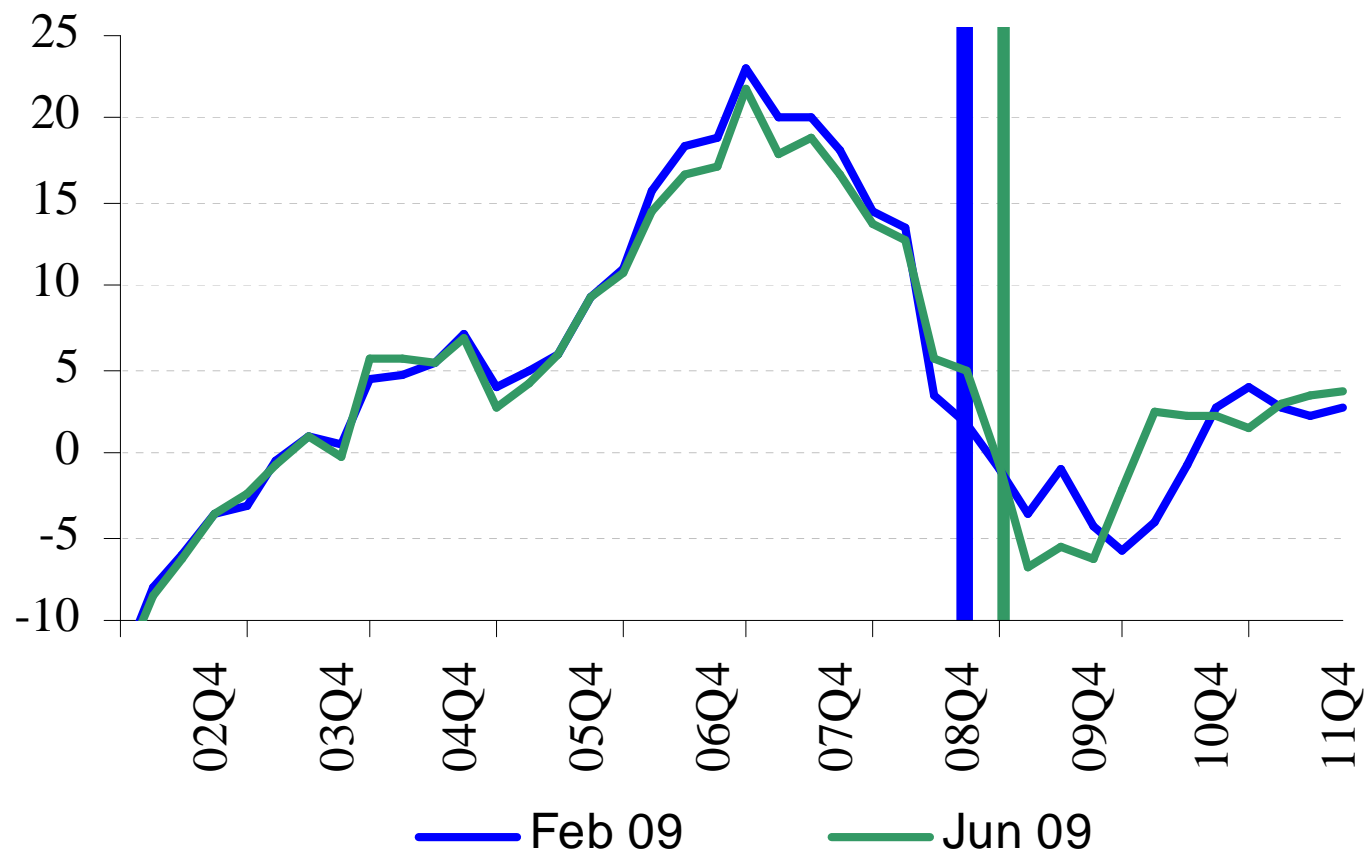
• Exchange rate

• Inflation

**II CHANGES IN
 THE PROJECTION**

III UNCERTAINTY

Gross fixed capital formation (y-o-y) (%)



Fixed capital formation : decomposition

I PROJECTION

a) Assumptions

b) Starting point

c) Projection for
 2009-2011

• GDP

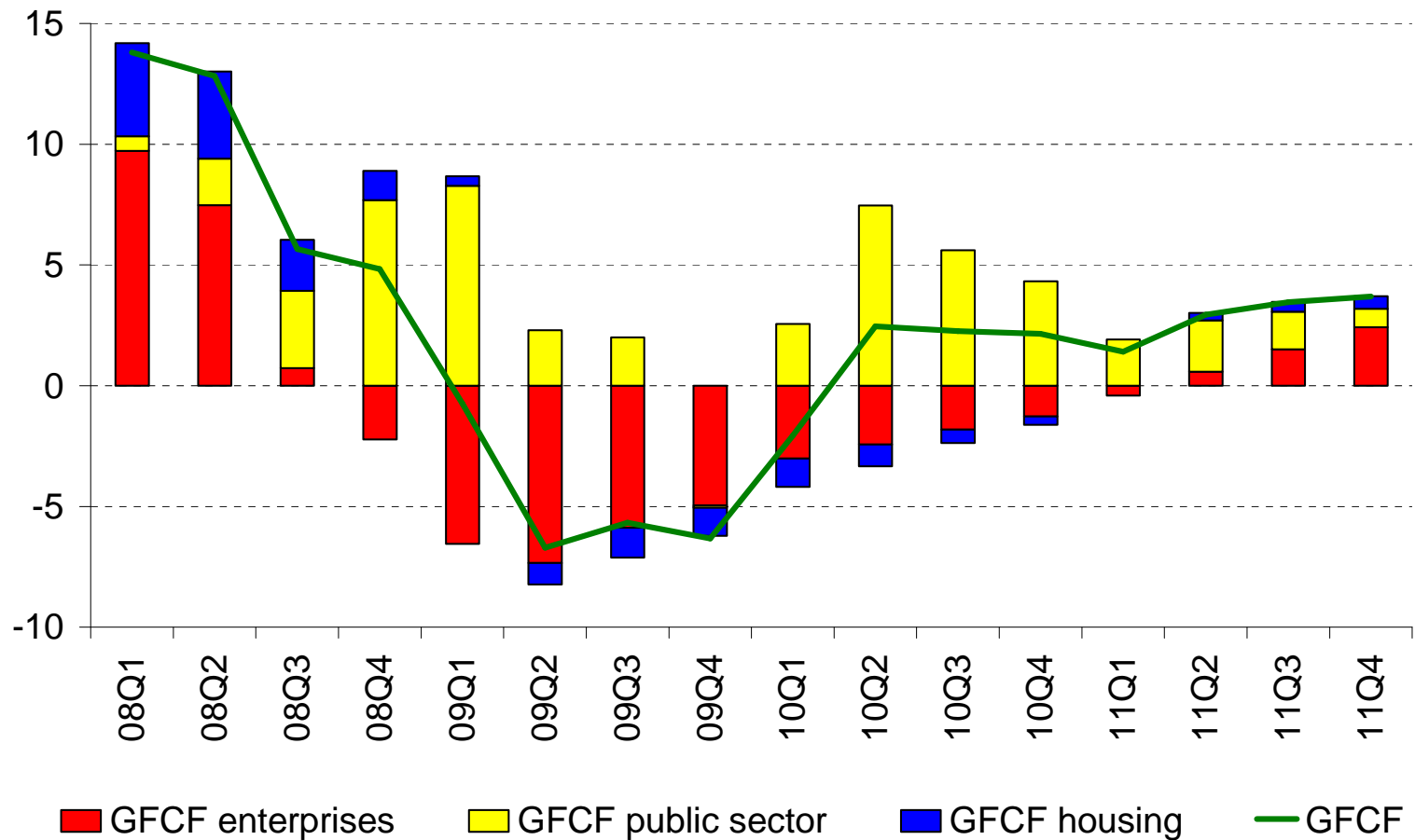
• Labour market

• Exchange rate

• Inflation

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY



Individual consumption (lower)

I PROJECTION

a) Assumptions

b) Starting point

**c) Projection for
 2009-2011**

• GDP

• Labour market

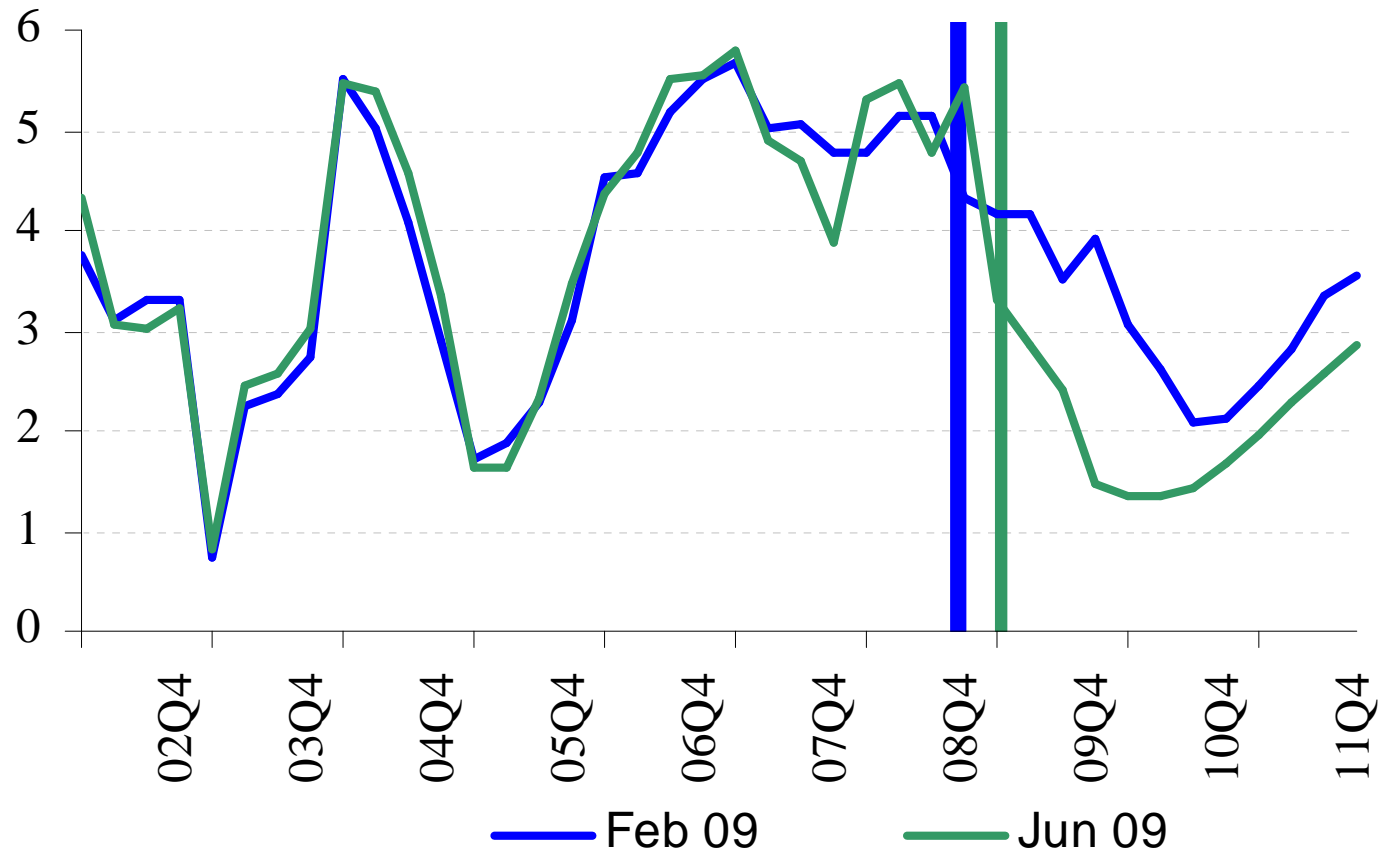
• Exchange rate

• Inflation

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

Individual consumption (y-o-y) (%)



Contribution of net exports (higher in 2009)

I PROJECTION

a) Assumptions

b) Starting point

**c) Projection for
 2009-2011**

• **GDP**

• Labour market

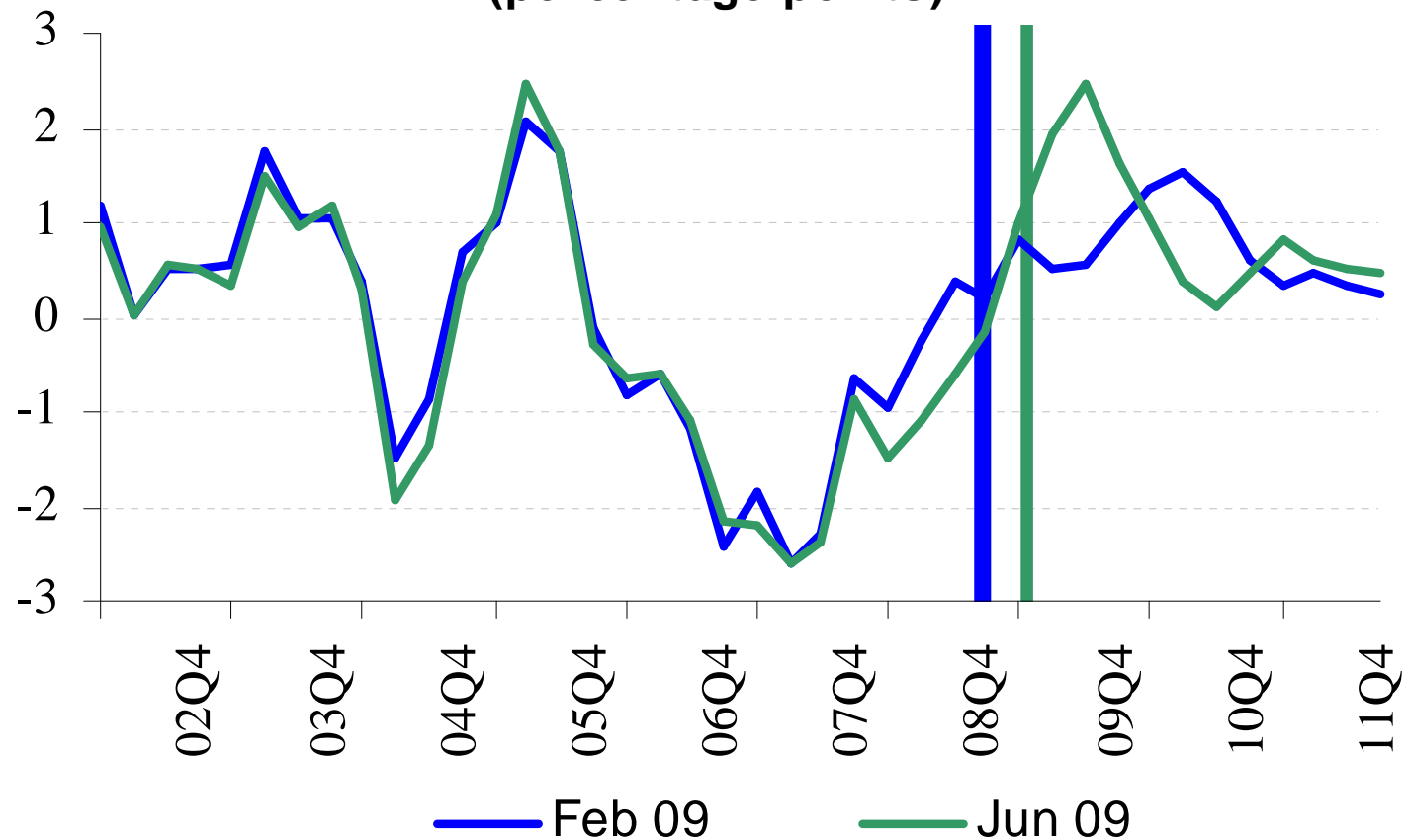
• Exchange rate

• Inflation

**II CHANGES IN
 THE PROJECTION**

III UNCERTAINTY

**Contribution of net exports
 (percentage points)**



GDP
 (lower until 2011 Q2)

I PROJECTION

a) Assumptions

b) Starting point

**c) Projection for
 2009-2011**

• **GDP**

• Labour market

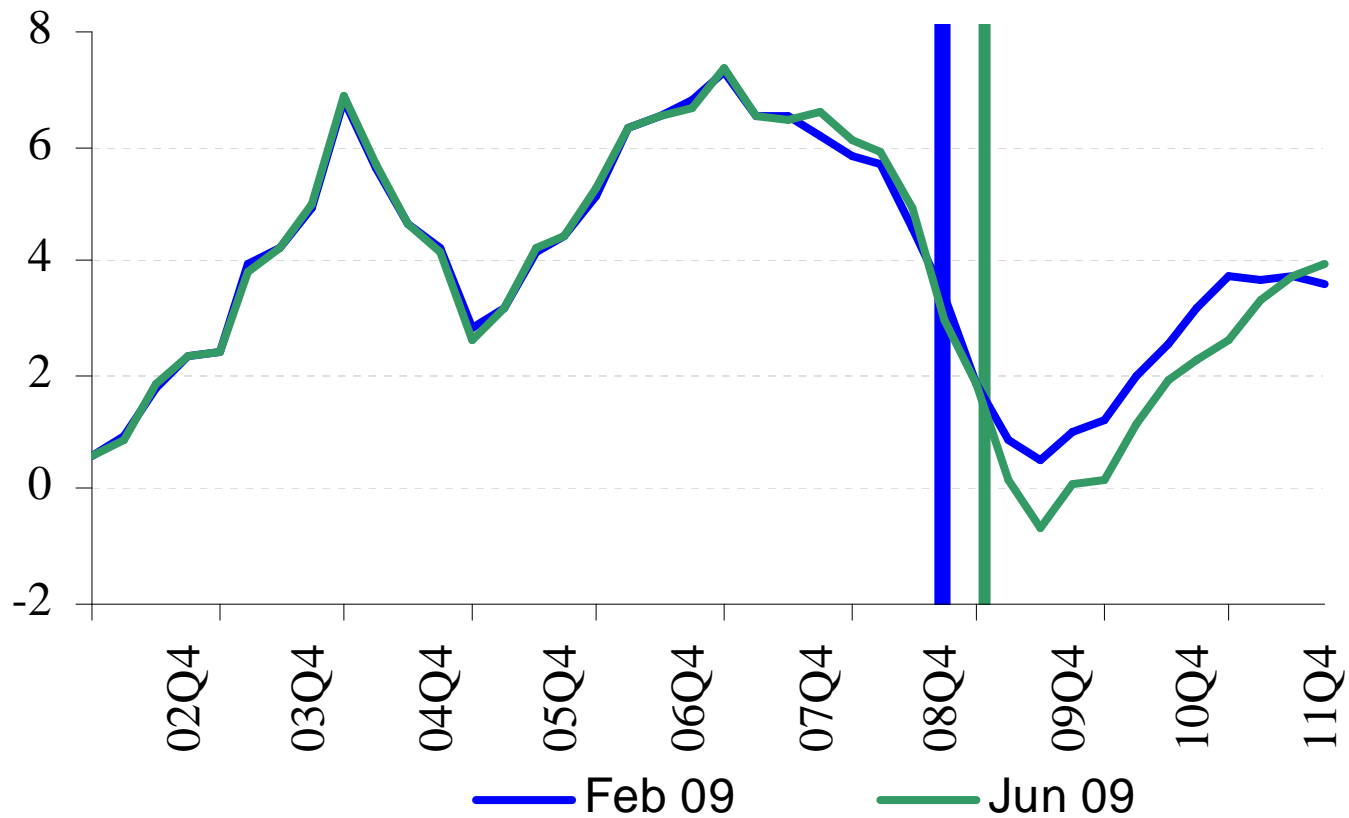
• Exchange rate

• Inflation

**II CHANGES IN
 THE PROJECTION**

III UNCERTAINTY

GDP (y-o-y) (%)



Labour market

(lower growth rate of employment between 2009 Q3 and 2011 Q3, lower unemployment rate, lower growth rate of wages between 2010 and mid-2011)

I PROJECTION

a) Assumptions

b) Starting point

c) Projection for 2009-2011

- GDP

- Labour market

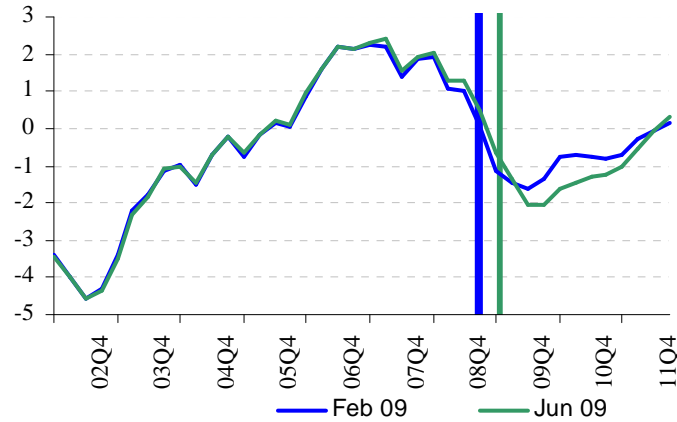
- Exchange rate

- Inflation

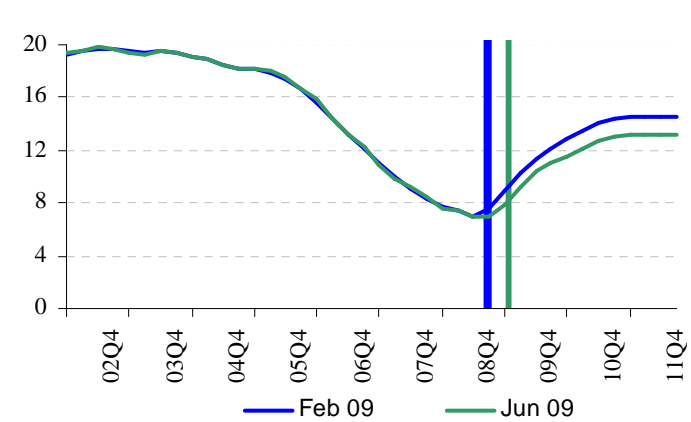
II CHANGES IN THE PROJECTION

III UNCERTAINTY

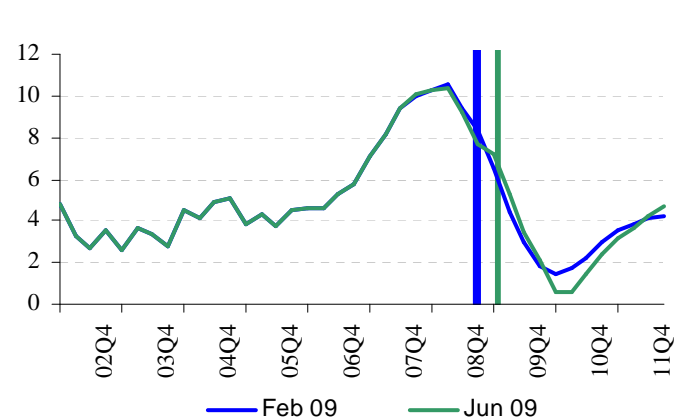
Total employment (y-o-y) (%)



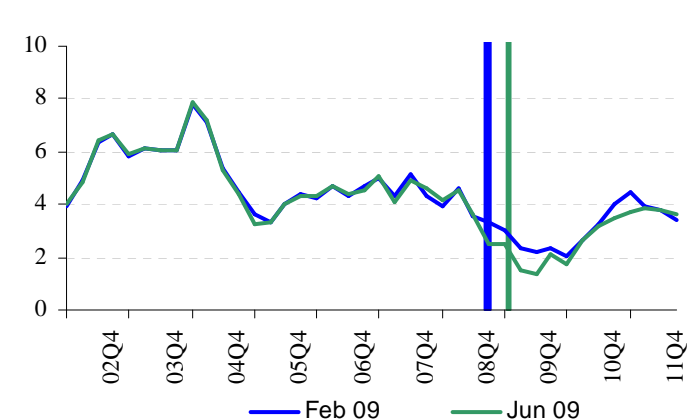
Unemployment %



Gross wages (y-o-y) (%)



Labour productivity (y-o-y) (%)



I PROJECTION

a) Assumptions

b) Starting point

**c) Projection for
 2009-2011**

• GDP

• Labour market

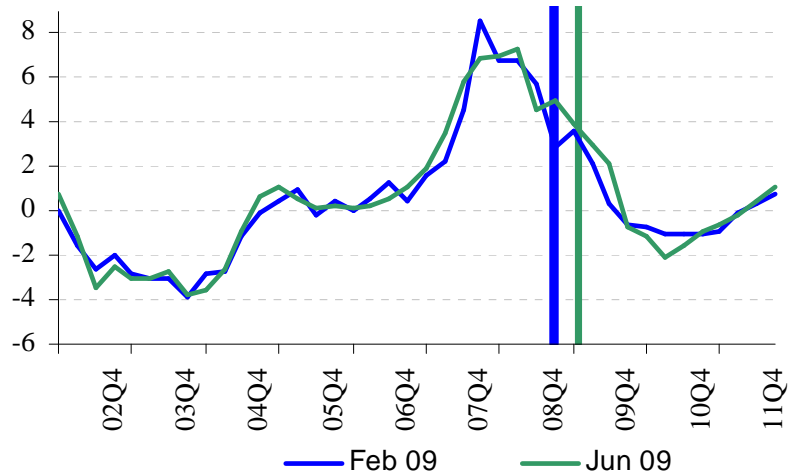
• Exchange rate

• Inflation

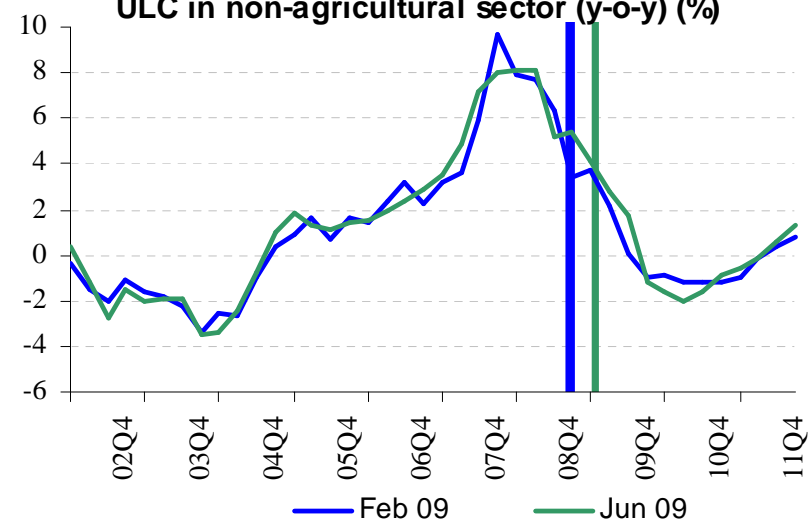
II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

ULC (y-o-y) (%)



ULC in non-agricultural sector (y-o-y) (%)



I PROJECTION

a) Assumptions

b) Starting point

**c) Projection for
 2009-2011**

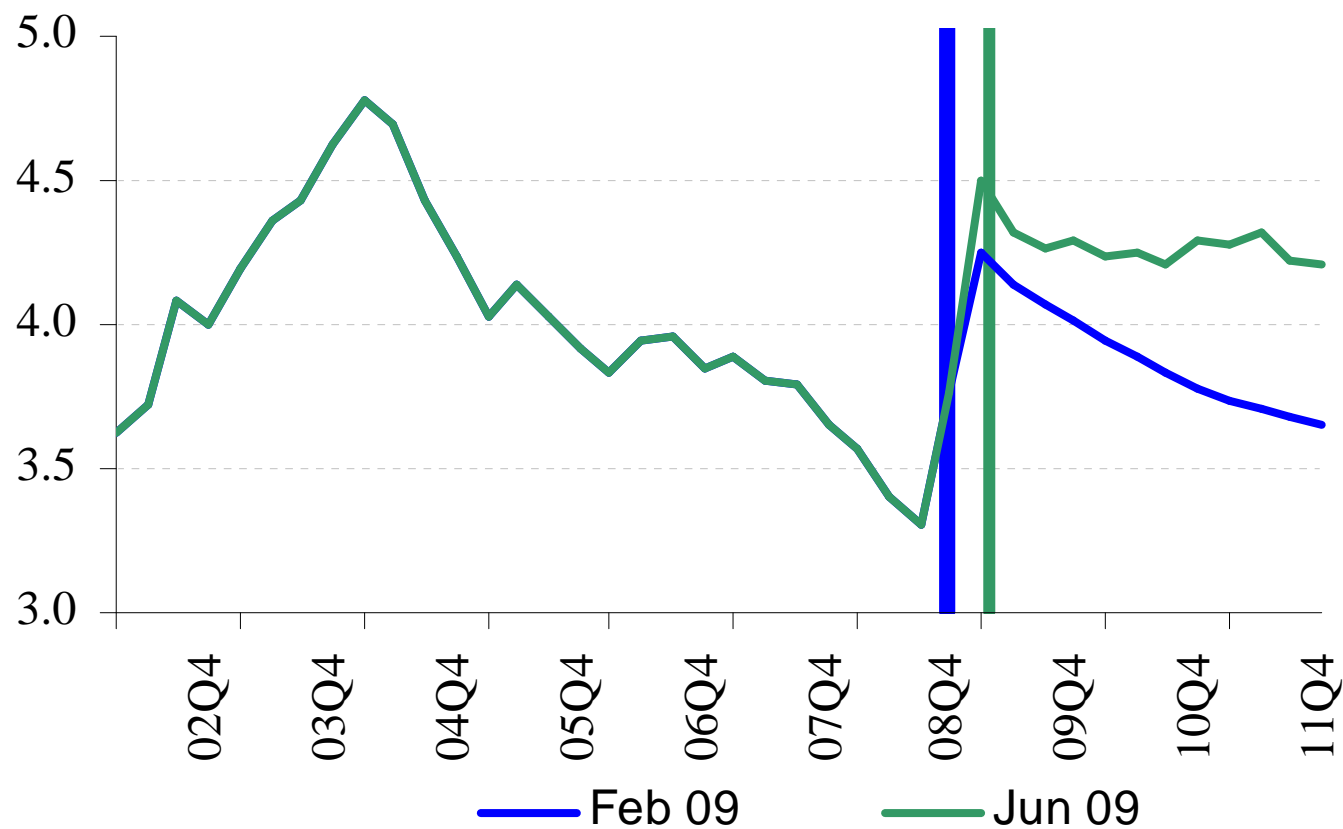
- GDP
- Labour market
- **Exchange rate**

• Inflation

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

EUR/PLN Exchange rate



Core inflation*

(lower till the end of 2009)

I PROJECTION

a) Assumptions

b) Starting point

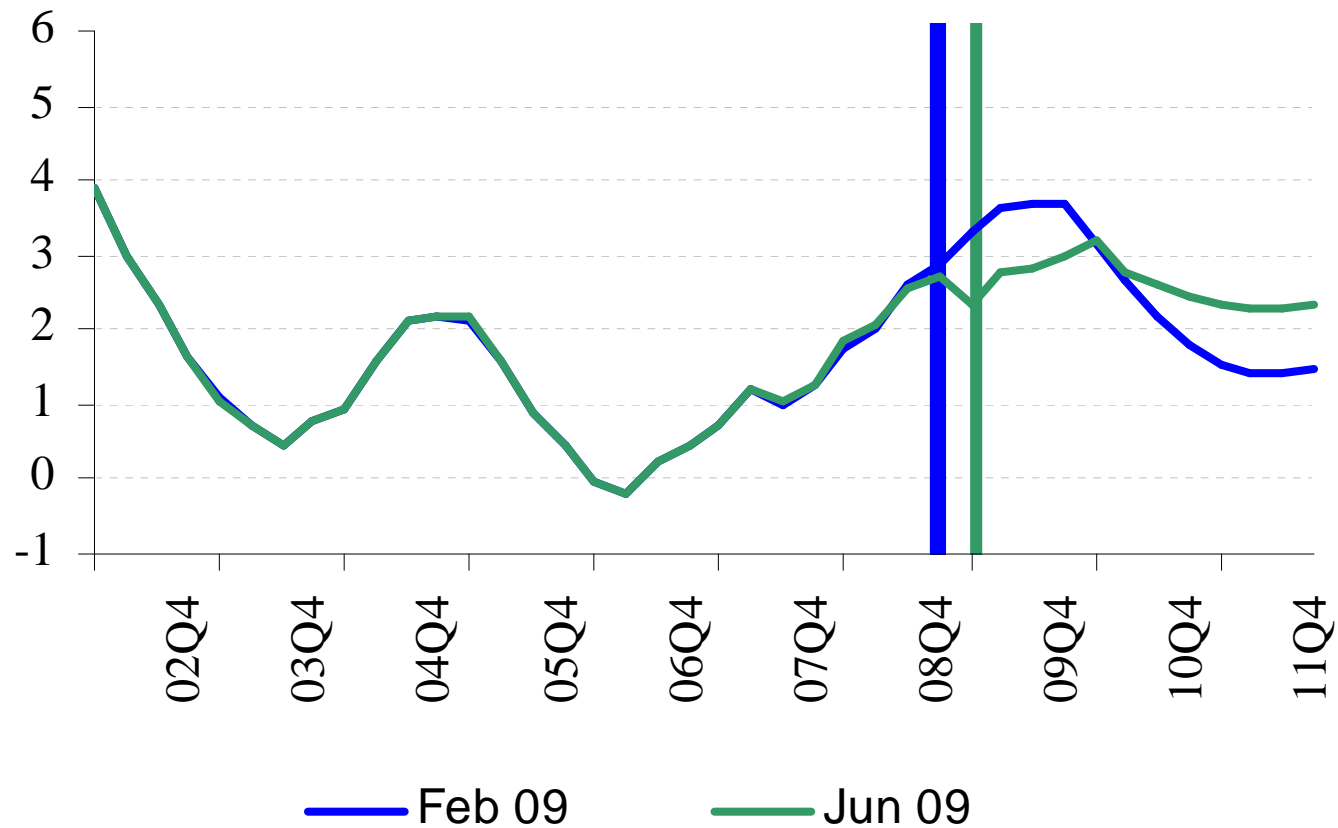
c) Projection for
 2009-2011

- GDP
- Labour market
- Exchange rate
- **Inflation**

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

Core inflation (%)



* Core inflation does not include prices of food and non-alcoholic beverages and prices of energy carriers

Determinants of core inflation

I PROJECTION

a) Assumptions

b) Starting point

c) Projection for
 2009-2011

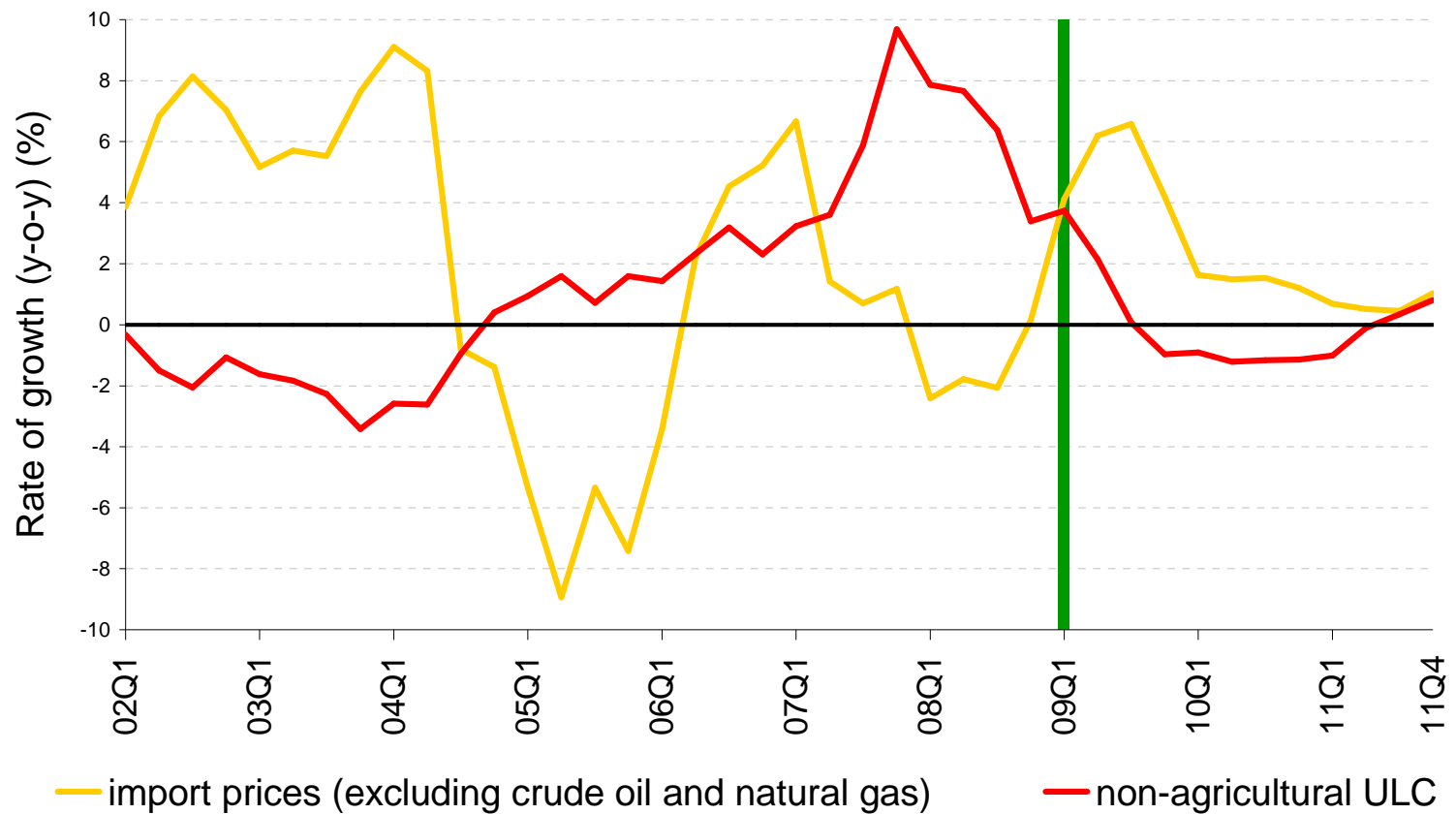
- GDP
- Labour market
- Exchange rate

• **Inflation**

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

Determinants of core inflation (y-o-y) (%)



CPI inflation

(higher in longer horizon)

I PROJECTION

a) Assumptions

b) Starting point

**c) Projection for
 2009-2011**

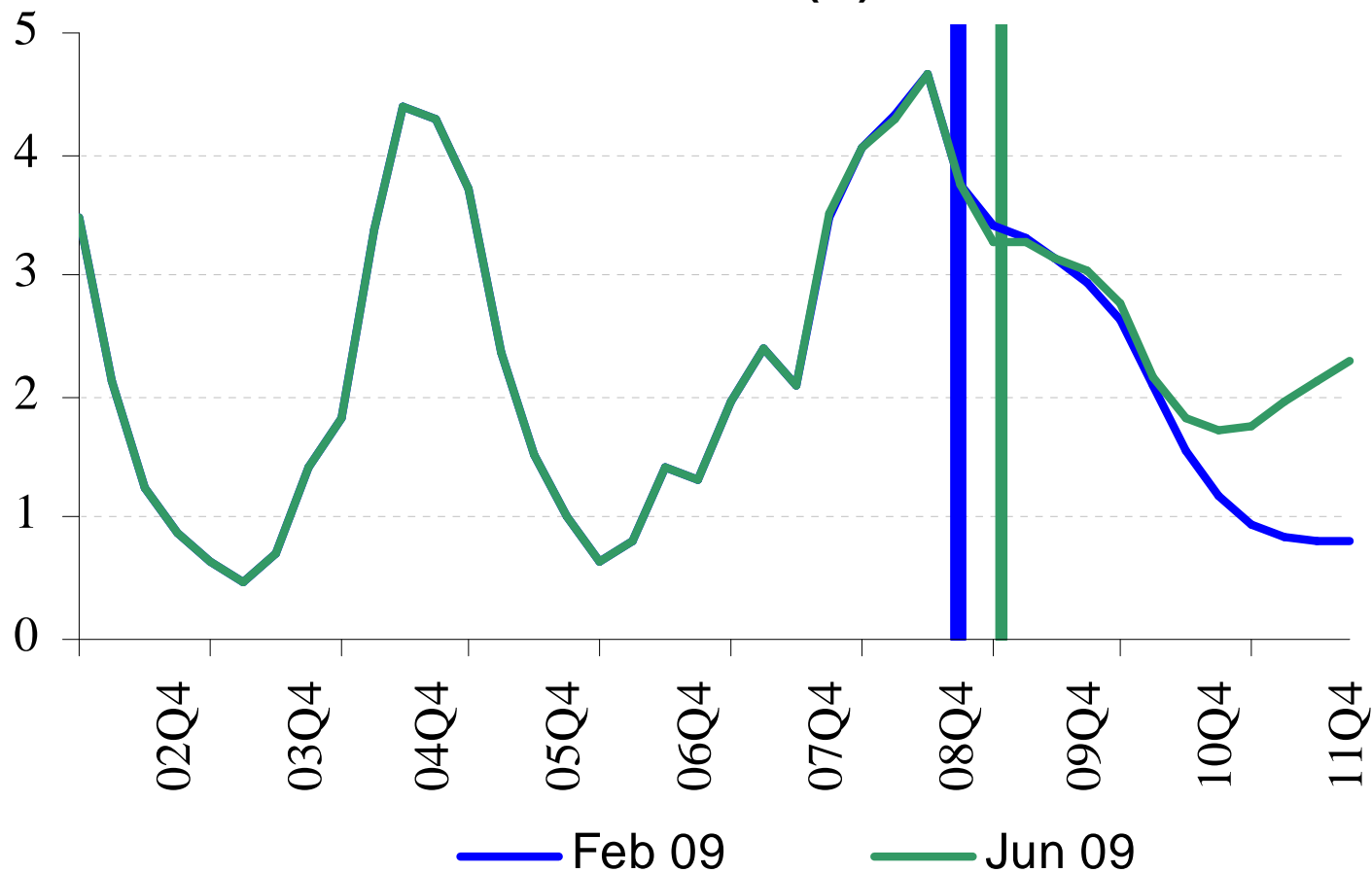
- GDP
- Labour market
- Exchange rate

• Inflation

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

CPI inflation (%)



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I PROJECTION

**II CHANGES IN
THE PROJECTION**

a) With respect to the
previous projection

b) Expert
adjustments

III UNCERTAINTY

CHANGES IN THE PROJECTION

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*ECONOMIC
INSTITUTE*

I PROJECTION

**II CHANGES IN
THE PROJECTION**

a) With respect to the
previous projection

b) Expert
adjustments

III UNCERTAINTY

June projection in comparison to the February projection

Change in the projection scenario

I PROJECTION

II CHANGES IN THE PROJECTION

a) With respect to the
previous projection

b) Expert
adjustments

III UNCERTAINTY

- Revision of assumptions about the world economy***
- Weaker zloty at the starting point**
- Lower core inflation at the starting point**

Scale of adjustments:

*** significant
** medium
* small

Changes in the model – impulses responses(CPI)

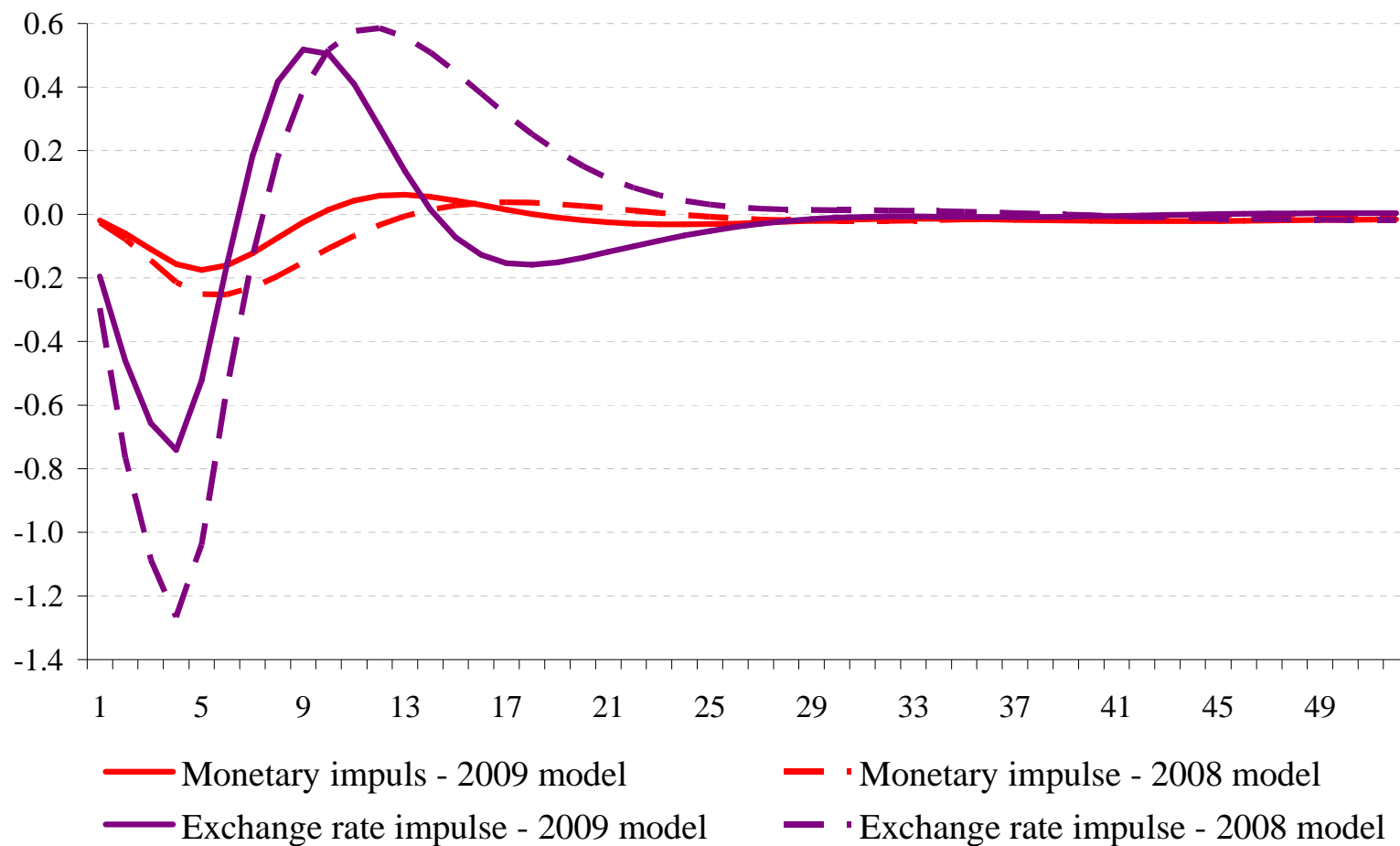
I PROJECTION

II CHANGES IN
 THE PROJECTION

a) With respect to the
 previous projection

b) Expert
 adjustments

III UNCERTAINTY



Changes in the model – impulses (GDP)

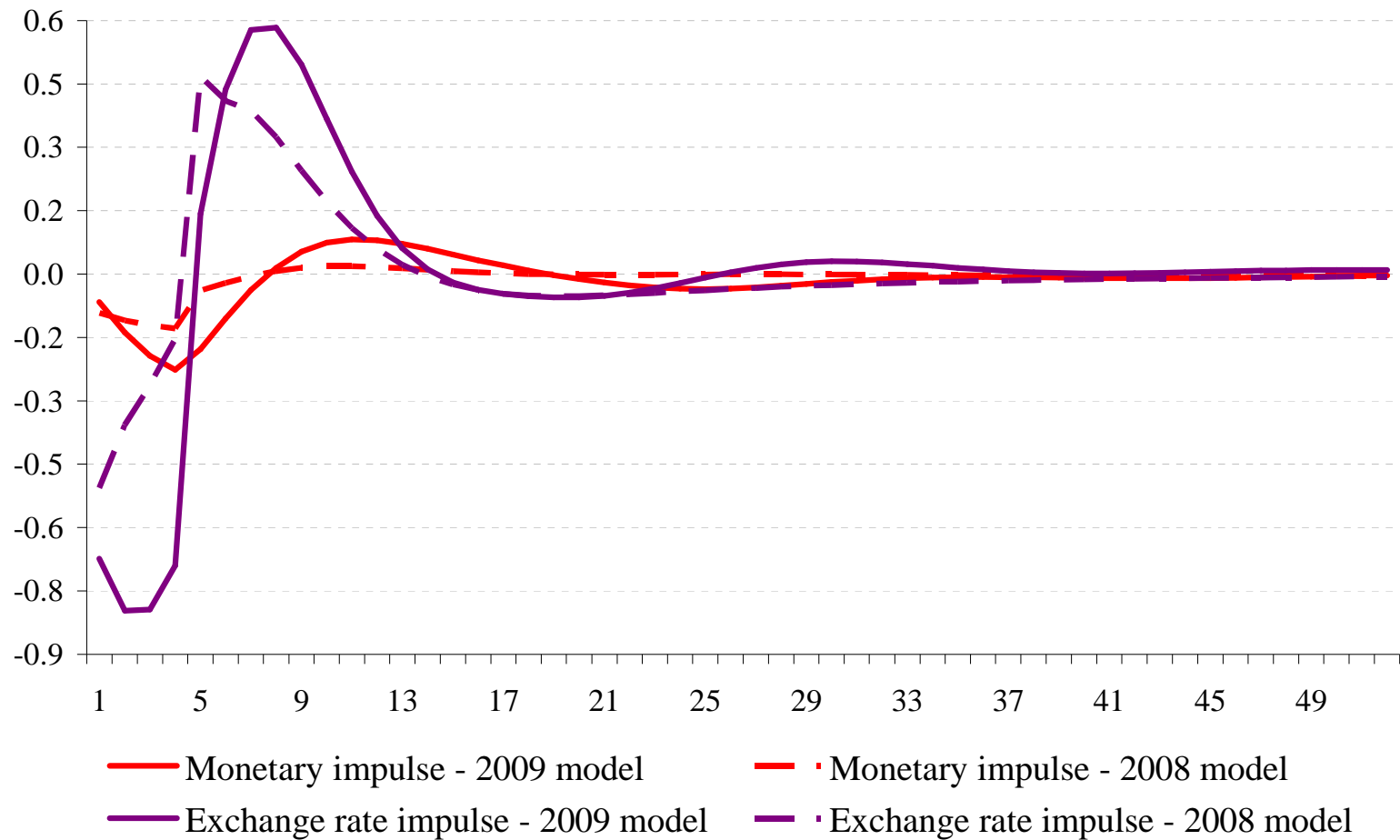
I PROJECTION

II CHANGES IN
 THE PROJECTION

a) With respect to the
 previous projection

b) Expert
 adjustments

III UNCERTAINTY



I PROJECTION

**II CHANGES IN
THE PROJECTION**

a) With respect to the
previous projection

**b) Expert
adjustments**

III UNCERTAINTY

Expert adjustments

Main areas of expert adjustments

I PROJECTION

II CHANGES IN THE PROJECTION

a) With respect to the
previous projection

**b) Expert
adjustments**

III UNCERTAINTY

- Adjustments accounting for deterioration of credit conditions for the private sector
- Dampened transmission of the deepening of slowdown of the Polish economy to the real exchange rate, due to significant undervaluation of the Zloty at the turn of 2008 and 2009

I PROJECTION

II CHANGES IN
THE PROJECTION

a) With respect to the
previous projection

**b) Expert
adjustments**

III UNCERTAINTY

Expert adjustments in the June forecasting round:

- Credit margin on mortgage loans and loans to enterprise sector***
- Investment outlays of private sector***
- Real effective exchange rate**
- Public consumption**
- General Government sector**
- Employed and wages**
- Prices of energy carriers in Poland**

Scale of adjustments:

*** significant
** medium
* small

Joint impact of adjustments on inflation and GDP

I PROJECTION

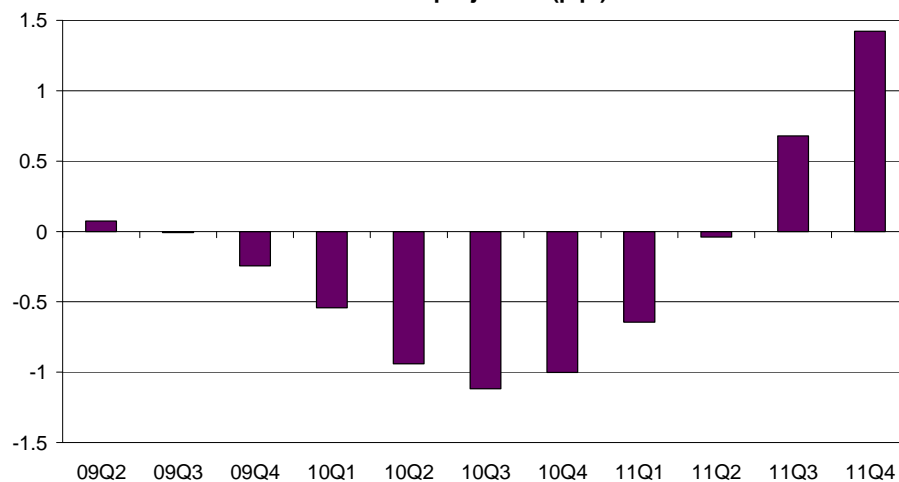
II CHANGES IN
 THE PROJECTION

a) With respect to the
 previous projection

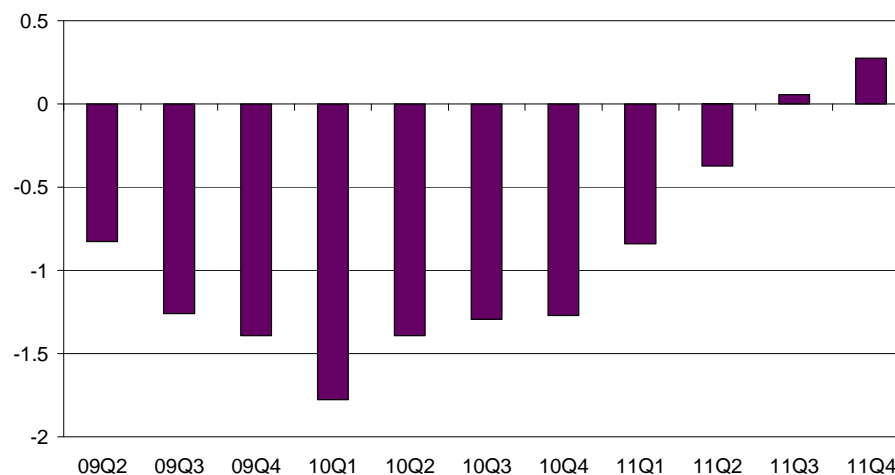
b) Expert
 adjustments

III UNCERTAINTY

Deviation of CPI inflation path
 from raw projection (p.p.)



Deviation of GDP growth path
 from raw projection (p.p.)



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I PROJECTION

II CHANGES IN
THE PROJECTION

III UNCERTAINTY

UNCERTAINTY OF PROJECTION

Overview of probabilities for inflation

I PROJECTION

II CHANGES IN
 THE PROJECTION

III UNCERTAINTY

Probability of inflation running:					
	below 1.5%	below 2.5%	below 3.5%	below the central path	in the range (1.5%; 3.5%)
2009 Q2	0.00	0.06	0.66	0.49	0.66
2009 Q3	0.03	0.21	0.67	0.48	0.65
2009 Q4	0.07	0.29	0.64	0.48	0.57
2010 Q1	0.16	0.41	0.71	0.48	0.55
2010 Q2	0.32	0.59	0.81	0.49	0.48
2010 Q3	0.42	0.64	0.83	0.50	0.41
2010 Q4	0.43	0.66	0.83	0.48	0.40
2011 Q1	0.42	0.64	0.81	0.49	0.39
2011 Q2	0.40	0.60	0.78	0.49	0.38
2011 Q3	0.37	0.55	0.74	0.49	0.37
2011 Q4	0.34	0.52	0.71	0.48	0.36

1. Situation in the General Government sector and fiscal policy

- Uncertainty about the scale and effectiveness of necessary changes to budget policy amid significant reduction of general government revenue and risk of increased cost of public debt financing in the conditions of risk aversion prevalent in financial markets
- Fiscal policy direction is a risk factor for:
 - **Domestic demand** (negative – reduction of spending on intermediate consumption, freezing of general government sector wages),
 - **Medium-term growth rate and labour market** (negative – reduction of public investments, increased fiscal burden),
 - **Inflation** (decreasing – counter-action of current expenditures of the public sector, increasing – rising of tax and quasi-tax burden)

2. Labour market developments

- Scenario of labour market developments depends on Polish labour market flexibility.
- Additionally, it is subject to a number of multi-directional risks connected with:
 - structural policy of the government,
 - effect exerted on labour market by planned or already introduced regulations (such as reductions of tax rates or changes concerning the level of minimum wages),
 - actual scale of return migration,
 - quality of labour resources and fitting of their structure to labour demand structure.

3. Situation in financial sector

- Amid liquidity limitations and in view to grimmer outlook for development of banks and enterprises, the scale of transmission of the central bank's reference rate cuts to cost of credit may be incomplete.

4. Global economic climate and its transmission into the state of Polish economy

- Continuing global recession combined with lower flexibility and, consequently, lower resilience of Polish economy to shocks may significantly dampen the outlook for growth in projection period.

5. Exchange rate path and competitiveness of the economy

- Due to uncertainty connected with the path of real and nominal economic processes around the world, there is a significant uncertainty as to the future path of zloty exchange rate, terms-of-trade developments and contribution of net exports to growth.
- Additional factor is the still unresolved question of introducing the zloty into ERM II mechanism in the coming years

6. Risks to EU fund utilisation

- Deteriorated revenue situation of local governments coupled with tightened criteria for granting bank loans pose a threat to EU fund utilisation by public sector.

7. Path of food and energy carrier prices

- Unknown scale of the impact of price declines in world markets on the reduction of price inflation rate in Poland
- Unknown pace and scope of deregulation of Polish energy market and possible incomplete transmission of falling world prices of coal into domestic coal prices

8. Integration and institutional processes

- Risk connected with the scale in which new regulations on carbon dioxide emissions and environment protection measures may affect economic activity
- Uncertainty as to the direction of EU policies in terms of trade exchange with countries outside the EU (possible rise of protectionist tendencies)
- Lack of final solutions concerning spatial development

9. Discussion of data released after 22 May 2009

- Rise in current prices of (and futures contracts for) the majority of energy commodities
- Significant rising tendency on the majority of food markets,
- Preliminary GUS (Polish CSO) estimate of GDP in 2009 Q1.

Uncertainty factors – summary

Having considered the above discussed uncertainty factors, it is assessed that the risk of inflation running above the central path prevails throughout the projection horizon.

As regards growth, extra-projection risk factors point to some probability of economic slowdown in Poland proving longer than it was accounted for in the projection.