Near-Term Forecasting of GDP at the CNB

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NTF of GDP at the CNB

Overview

1. NTF of GDP at the CNB: users, goals, models
2. Expert forecasts within the core framework
3. Models within the core framework

1. NTF of GDP at the CNB

- Users:
  - GDP + exp. components forecast 1Q ahead is treated “as history” in the medium-term model (g3)
  - Further Q-s ahead (1-2 years) serves as a benchmark for the medium-term model (g3)
- Goals and requirements:
  1. forecast precision a few (1-3) quarters ahead
  2. relatively smooth components forecast in q-o-q growths (required by g3)
  3. story-telling based on expenditure components
  4. good benchmark for g3 1-2 years ahead

1. NTF of GDP at the CNB

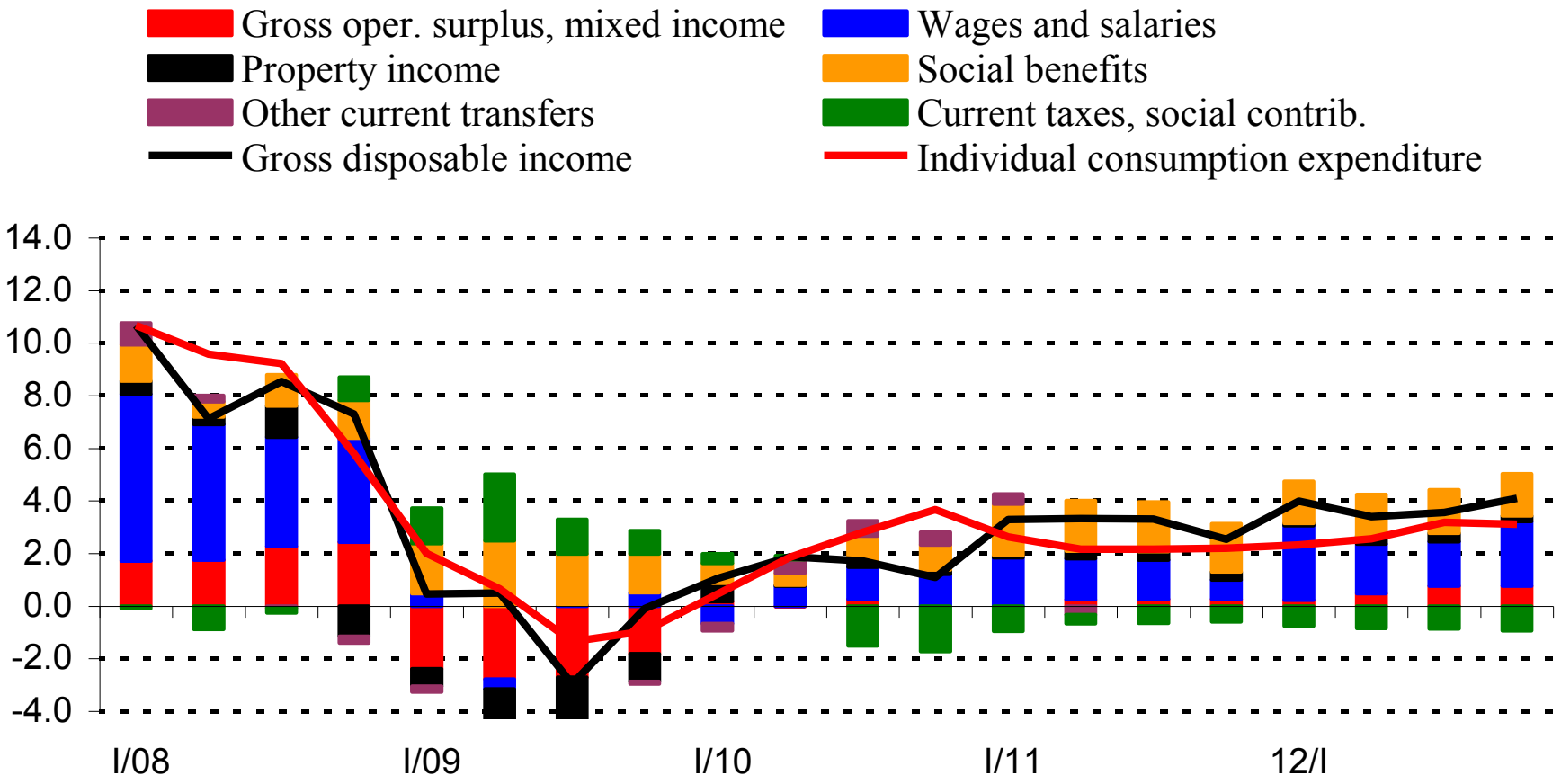
- Models:
  - Core framework:
    - Single-equation econometric models for I, X, M + all deflators (C, I, G, X, M)
    - Quarterly interpolation of G based on a nominal annual forecast (made at another department) + quarterly forecast of the deflator
    - Expert forecast of private consumption with disposable income broken down into components + smoothing by the savings rate and some components of disp. income
  - Benchmark models:
    - Near-term models of GDP using monthly leading indicators: principal components, dynamic factor models, bridge equations, and averaged bivariate VARs.

2. Expert Forecasts within the Core Framework

- Household Consumption
  - Decompose disposable income (DI) to components: operating surplus, wages and salaries, social contributions, transfers, taxes, etc.
  - Most components are forecast by our colleagues (quarterly or annually), others are judged
  - Get an idea of the new consumption forecast based on where the labor market and the fiscal forecast are moving
  - Taking into account the assumptions on DI components, smoothen consumption forecast by the savings rate and some DI components that are highly uncertain

2. Expert Forecasts within the Core Framework

- Household Consumption



2. Expert Forecasts within the Core Framework

- Government Consumption (G)
  - Get the annual fiscal forecast from colleagues
  - Interpolate nominal G into quarters by matching the annual sums (levels) in the fiscal forecast (quadratic interpolation from annual to quarterly data in E-Views)
  - Forecast the quarterly G deflator and deflate the forecast of nominal G to get real terms

3. Models in the Core Framework

- Export (EX):

Dependent Variable: QSA_EX_HP
Method: Least Squares
Date: 09/20/10 Time: 18:18
Sample (adjusted): 1996Q3 2010Q2
Included observations: 56 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
QSA_EX_HP(-1)	0.579	0.116	4.997	0.000
QSA_HDPEU_HP	2.118	0.491	4.311	0.000
Q_RERPPI_HP	0.403	0.125	3.217	0.002
DUM_EX	0.781	0.723	1.080	0.285

R-squared	0.750	Mean dependent var	2.271
Adjusted R-squared	0.735	S.D. dependent var	2.370

– q-o-q growths

– seasonally adjusted

– HP smoothed (λ=1)

– export (EX) linked to:

eurozone GDP (HDPEU)

real exchange rate deflated by relative PPI-s (RERPPI)

dummy: period of EU entry

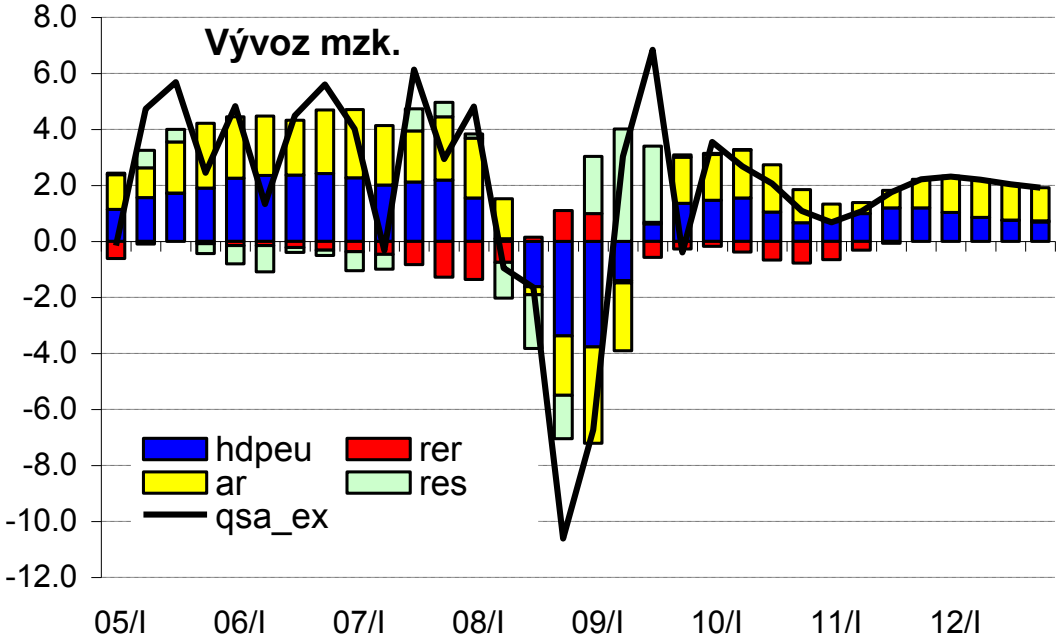
– HDP_EU and RER_PPI are forecast by colleagues

– this model is quite robust to new observations included

– the relationship was first researched without HP smoothing

3. Models in the Core Framework

- Export (EX):



– eurozone GDP is most important

– effect of real exchange rate is typically small

– quite significant persistence (AR term)

– quite a lot of unexplained variation during the recession (periods ’08-’09)

– some of the variation is cut off by the HP smoother (effects don’t add up to the black line)

3. Models in the Core Framework

- Investment (HTK):

Dependent Variable: QSA_HTK_HP
Method: Least Squares
Date: 09/20/10 Time: 18:36
Sample (adjusted): 1996Q3 2010Q2
Included observations: 56 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
QSA_HTK_HP(-1)	0.636	0.088	7.213	0.000
QSA_EX_HP_F(-1)	0.198	0.069	2.864	0.006
R-squared	0.607	Mean dependent var		0.365
Adjusted R-squared	0.600	S.D. dependent var		2.497

– q-o-q growths

– seasonally adjusted

– HP smoothed (λ=1)

– investment (HTK) linked to:

export (EX)

– difficult to find any other robust relationship between investment and other variables

– the relationship was first researched without HP smoothing

3. Models in the Core Framework

- Import (IM)

Dependent Variable: QSA_IM_HP
Method: Least Squares
Date: 09/29/10 Time: 14:05
Sample (adjusted): 1996Q2 2010Q2
Included observations: 57 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
QSA_SDSV_HP	0.377	0.093	4.058	0.000
QSA_HTK_HP	0.236	0.027	8.759	0.000
QSA_EX_HP	0.762	0.023	32.738	0.000

R-squared	0.949	Mean dependent var	2.113
Adjusted R-squared	0.947	S.D. dependent var	2.101

– q-o-q growths

– seasonally adjusted

– HP smoothed (λ=1)

– import (IM) linked to:

the sum of C+G (SDSV)

investment (HTK)

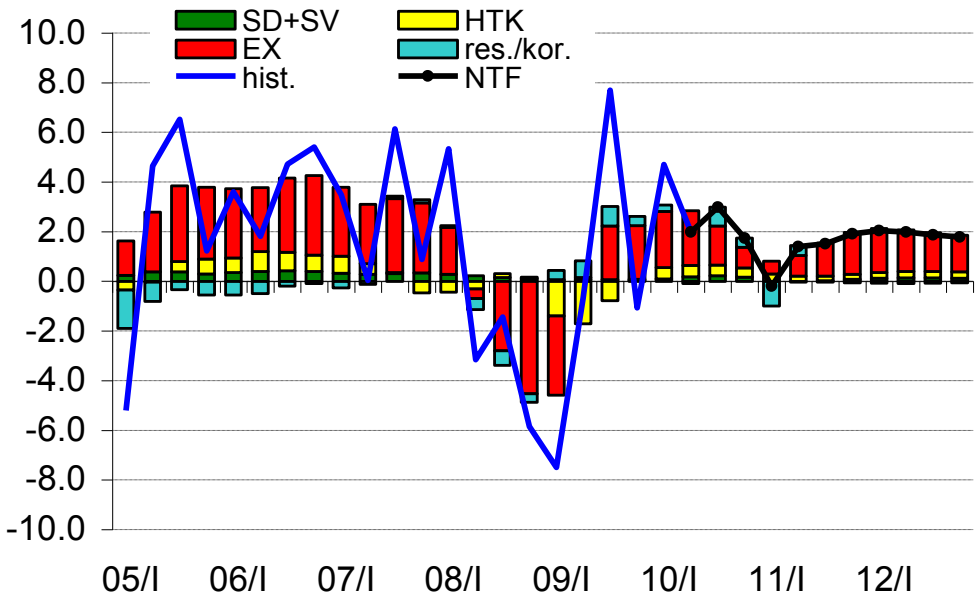
export (EX)

– forecasts of the C, G, I and EX are used

– the relationship was first researched without HP smoothing

3. Models in the Core Framework

- Import (IM)



– in our open economy, export is most important for the demand of imported goods

– the effects of investment and consumption (C+G) are small

– some of the variation is cut off by the HP smoother (effects don't add up to the blue line)

3. Models in the Core Framework

- Deflator of C:
  linked to CPI forecast and an AR(1) term, seasonally adjusted q-o-q growths
- Deflator of G:
  linked to CPI forecast, wages in the non-business sector (colleague's forecast) and an AR(1) term, seasonally adjusted q-o-q growths
- Deflator of I:
  Linked to forecasts of import deflator, CPI and AR(1) term, seasonally adjusted y-o-y growths
- Deflator of X and M:
  Forecast by colleague (D. Havrlant). Linked to the forecasts of import and export price indexes.
- GDP deflator:
  Linked to forecasts of CPI, X and M deflators, AR(1) term, seasonally adjusted y-o-y growths

3. Models in the Core Framework

- Compilation of the GDP forecast:
  - Compute weighted average of year-on-year growth rates of GDP components
  - weights: nominal weights of components in the same period of the preceding year
  - ex-post smoothening of the GDP forecast by adding expert judgement into some components, mainly investment (uncertainty) or import (has big weight)
  - Possibly reflect on the GDP forecast of benchmark models