
Towards the Macroeconomic Model of the Kyrgyz Economy

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Questions:

- What are the main factors that influence our economy: exogenous and endogenous
- How economic linkages are set and quantify them
- Determining how the monetary policy operates

Outline:

- Economic Facts
- Theoretical Model
- Empirical Results
- Concluding Remarks

1. Economic facts

1.1. Economic facts

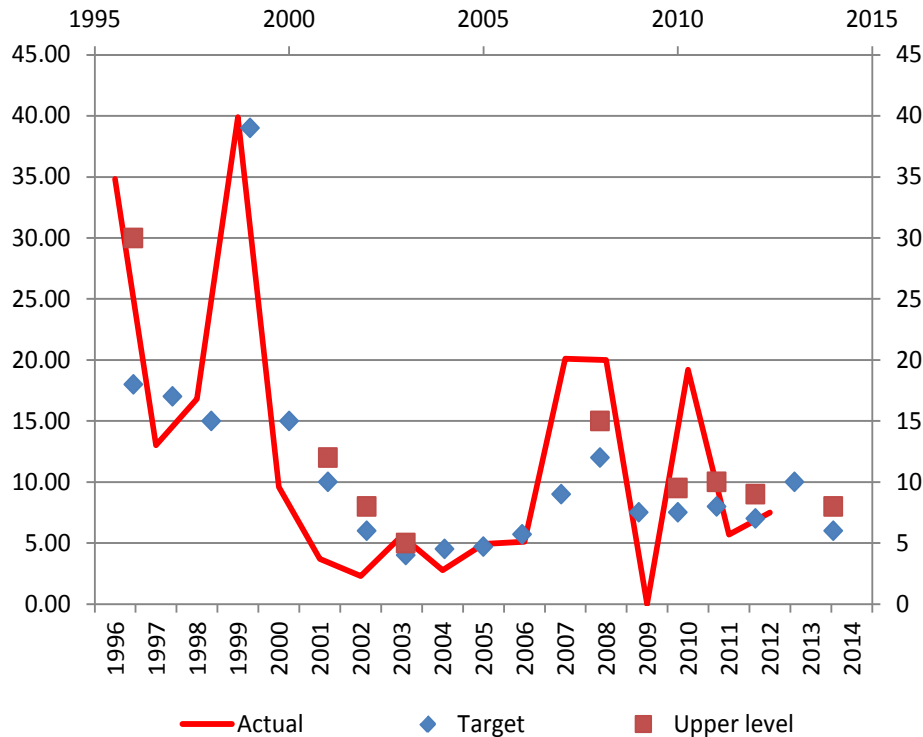
- Small open economy
- Main sectors: agriculture, gold mining, services
- Import dependent (oil, gas, wheat)
- Remittances are important (~30% GDP)
- Large “shadow” economy (>50% of GDP)

1.2. Economic facts

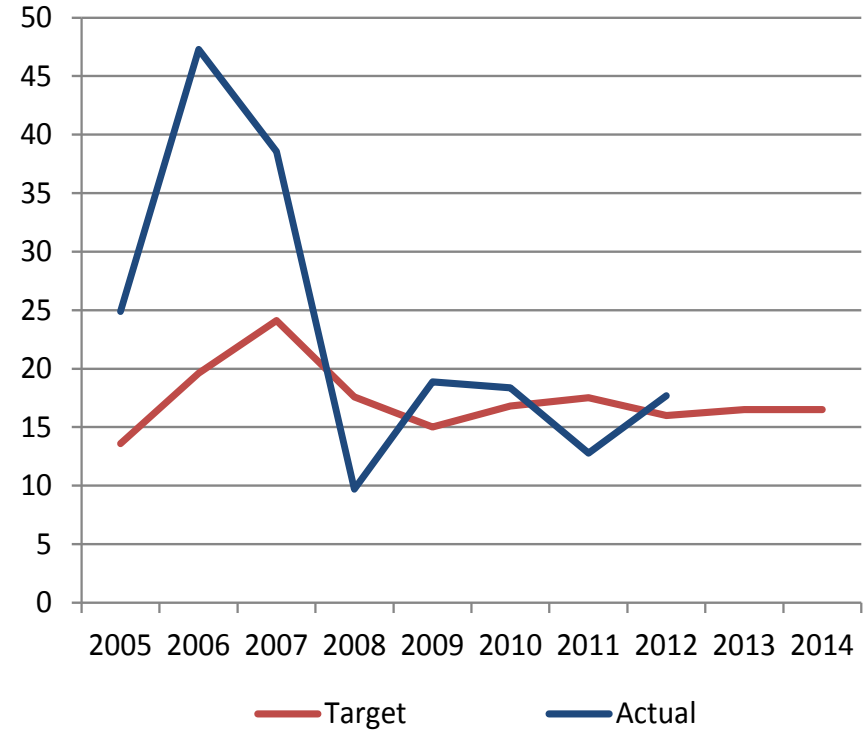
- Financial system
 - Banks dominate
 - No deep financial markets
 - Main instrument for investment – housing/land
- Fiscal policy is of high importance. Politically vulnerable.
- “Dirty” floating exchange rate regime

Target vs. Actual

CPI

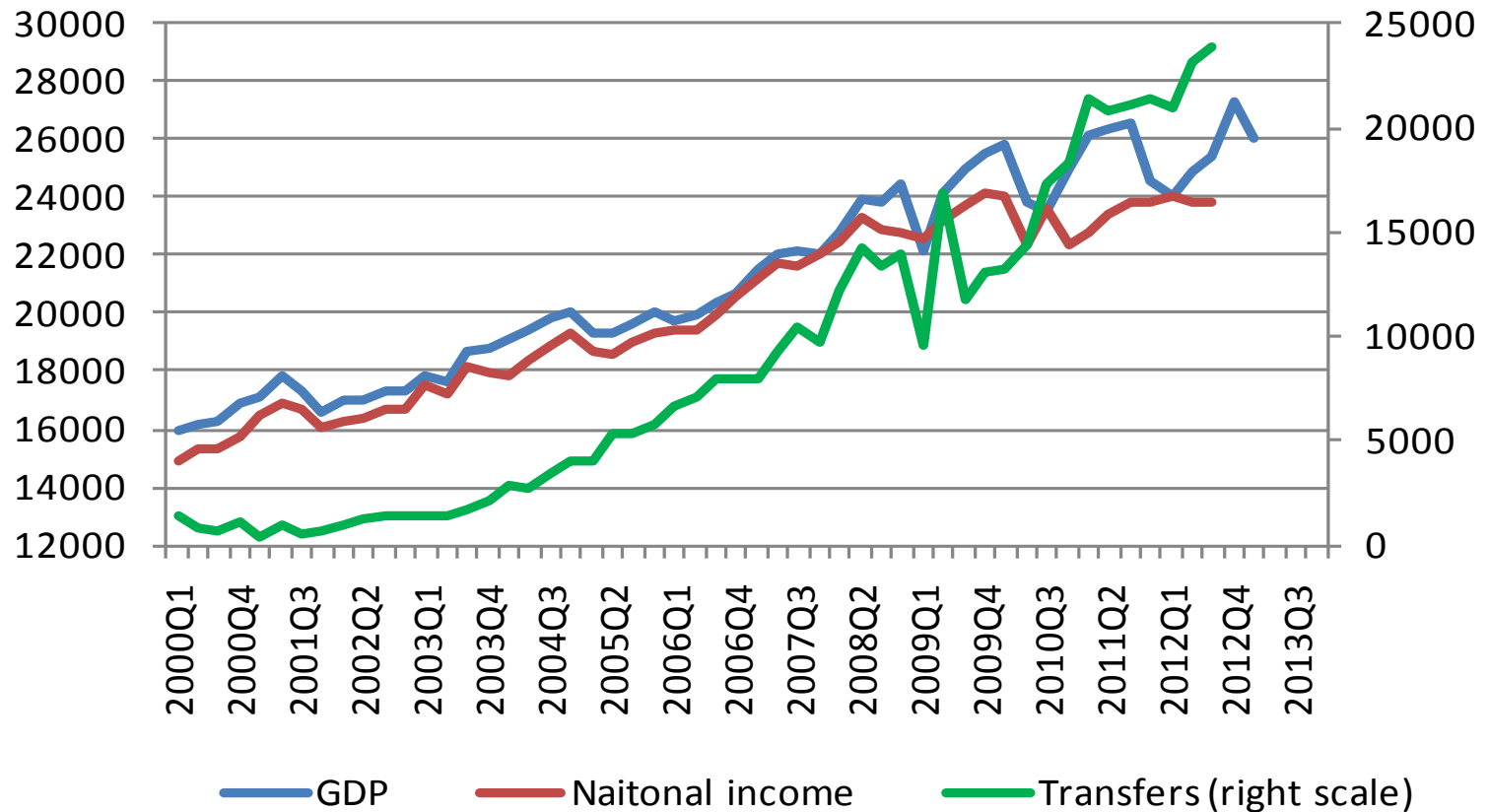


Monetary base



GDP, National Income and Transfers

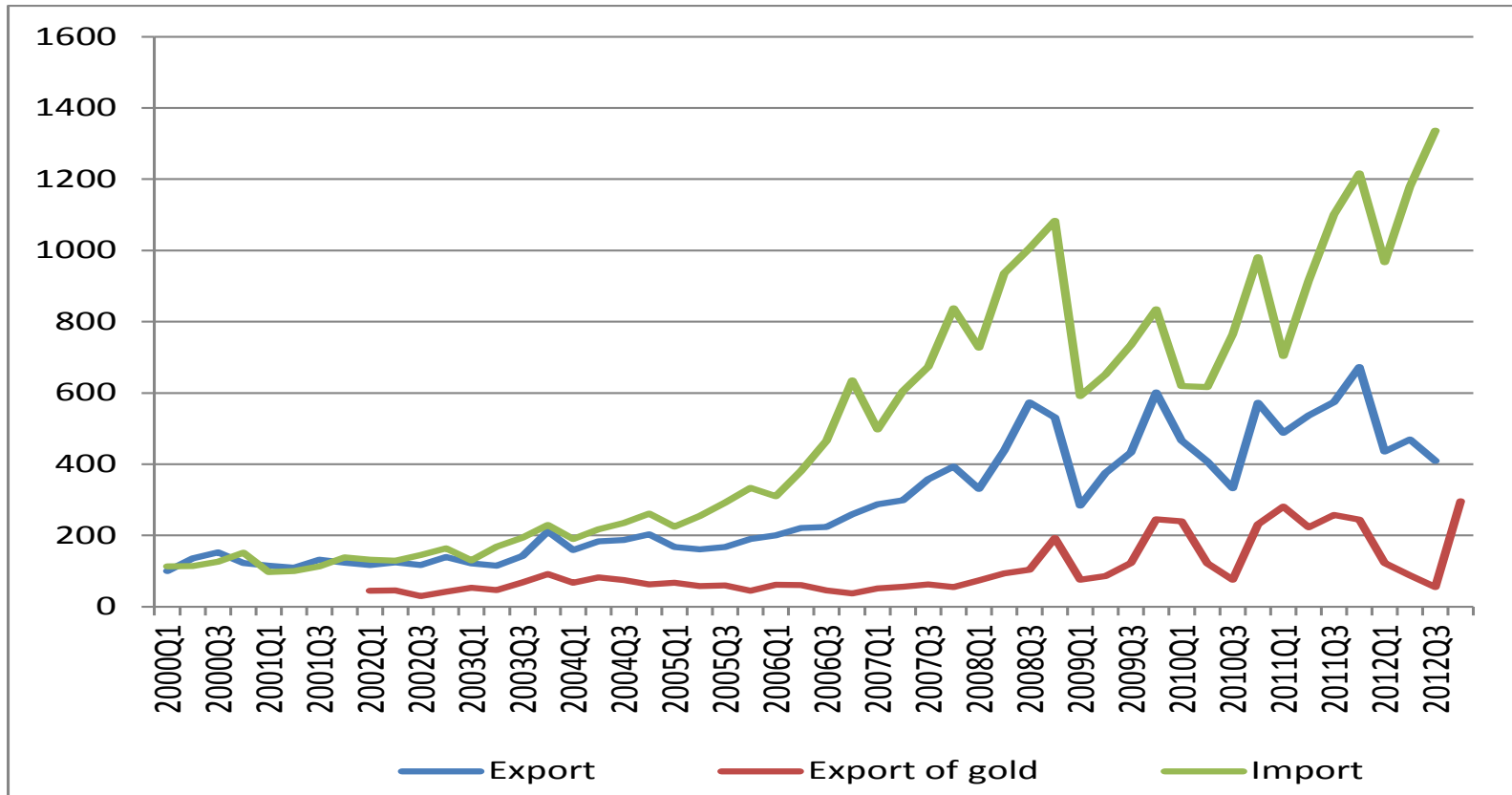
Remittances play important role



Export vs. Import

Large share of gold export

Import dependant

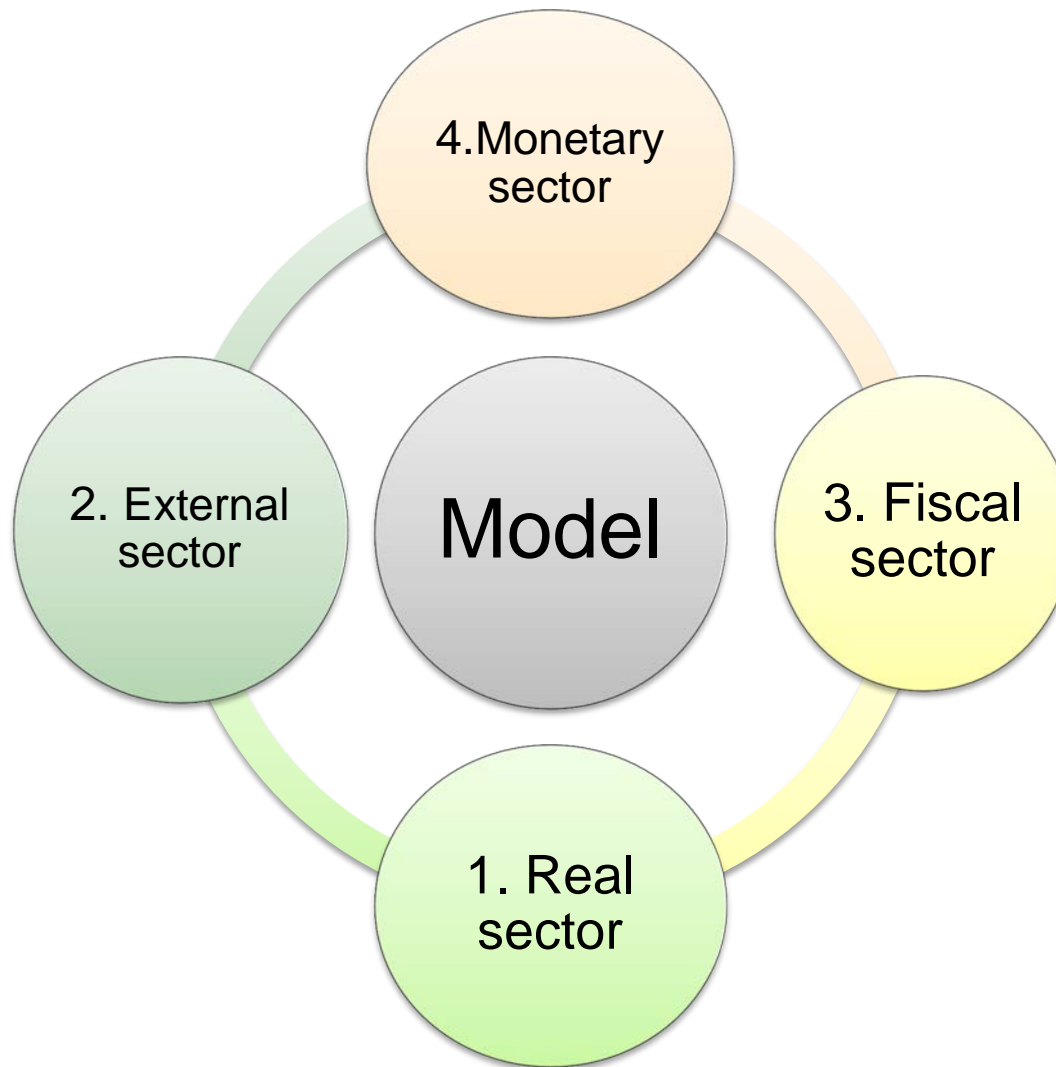


2. Theoretical concept of Model

2.1. The model is:

- Aggregated Structural
- Empirical
- Used for forecasting purposes
- Conditional

2.2. The model's concept



2.2.1. Real sector

- Conventional main macroeconomic identity

$$rgdp = cp + cg + i + \boxed{xg} + xr - im$$

- Consumption equation derived from classical consumption function.

$$cp = \beta_1 + \beta_2 rgdp + \beta_3 \boxed{UR_{soms}} - \beta_4 CPI + \beta_5 MB$$

2.2.2. External sector

- The balance of payments equilibrium

$$\boxed{XG} + XR - IM + \boxed{TR} + EO = R_t - R_{t-1}$$

- Import equation

$$im = \alpha_1 - \alpha_2 rer + \alpha_3 (cp + cg + i) + \boxed{\alpha_4 com_index} + \varepsilon,$$

- Export strongly depends on gold price and Russia's economic stance

2.2.3. Government finance sector

- Budget constraint

$$CPI(gc + gi) - CPI * gr = \Delta S_t + UA_{soms} - \Delta DG_t$$

- Government revenues

$$GR = \delta_1 + \delta_2 CPI + \delta_3 GDP + \delta_4 UA_{soms} + \delta_5 IM$$

- Government expenditures

$$GE = \tau_1 + \tau_2 CPI + \tau_3 GR + \tau_4 GE(-1)$$

2.2.4. Monetary sector

- NBKR balance sheet

$$RD + NLB + SNB = MB + DG + RES$$

- Interventions

$$Interventions = \alpha_1 Sell + \alpha_2 Buy + c$$

3. Empirical results

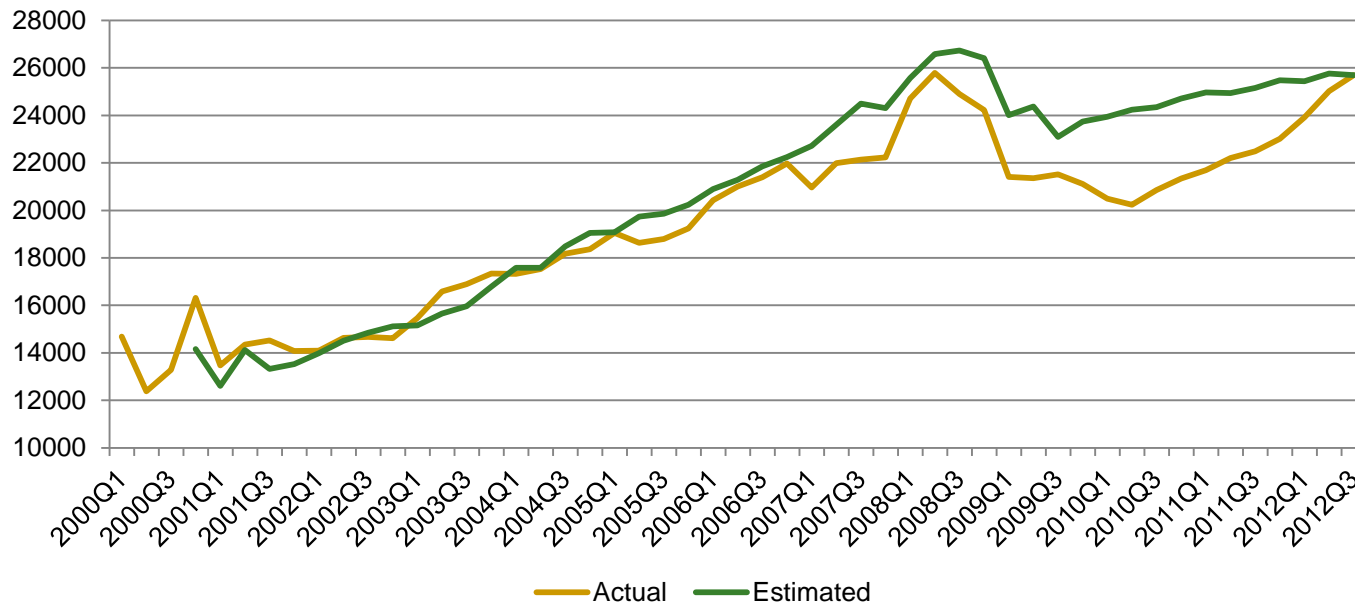
3.1. Data

- Quarterly data 2000:1 till 2012:4 with base 2000=100
- Seasonally adjusted
- Unit roots process => using first differences

3.2. Real sector

■ Consumption equation

$$cp_pr = \underbrace{0.3}_{(1.18)} Nat_{inc(-1)} + \underbrace{0.13}_{(5.44)} UR + \underbrace{0.06}_{(0.4)} MB(-2) + \underbrace{0.78}_{(178)} GDP_{ru(-1)} - 0.01$$



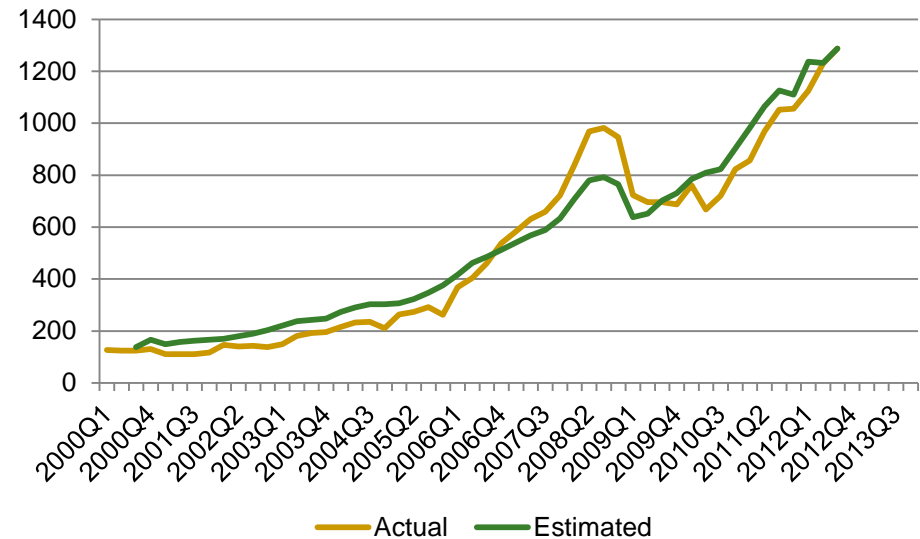
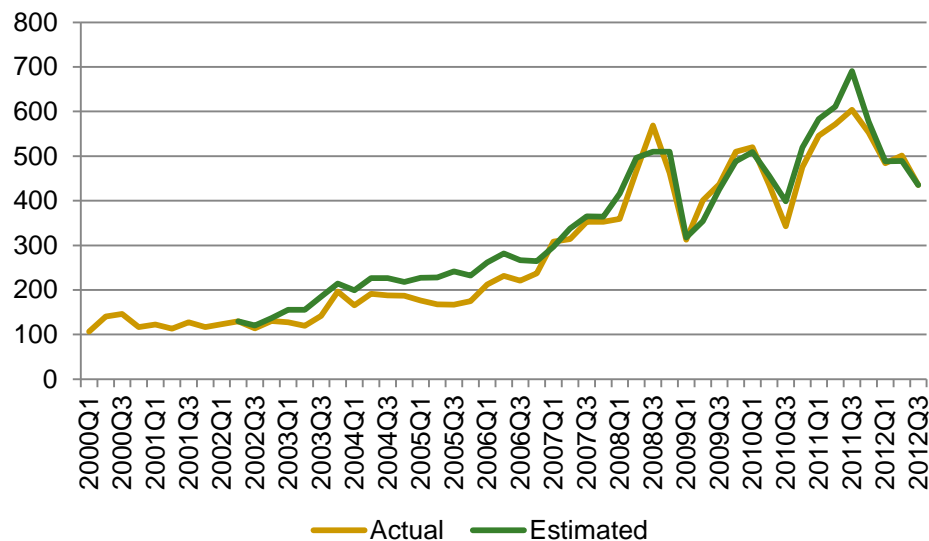
3.3. External sector

■ Export is exogenous

$$X = \frac{-0.005}{(0.28)} + \frac{0.34}{(7.99)} XG + \frac{2.7}{(3.02)} GDP_RU$$

■ Import estimates

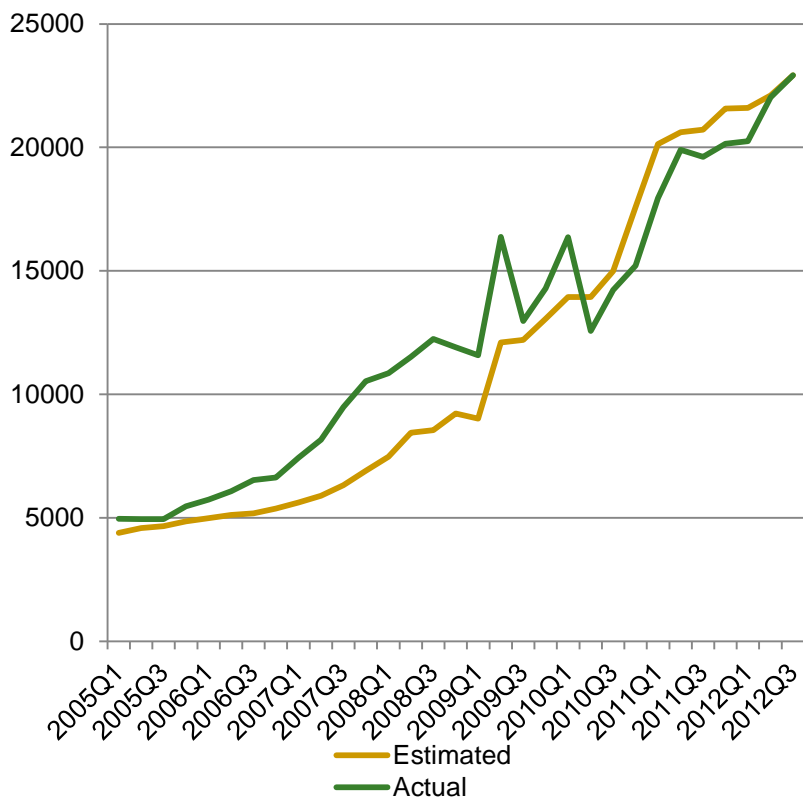
$$IM = \frac{0.03}{(1.13)} + \frac{0.19}{(2.21)} GSCI + \frac{0.89}{(3.74)} (cp + i)$$



Fiscal sector

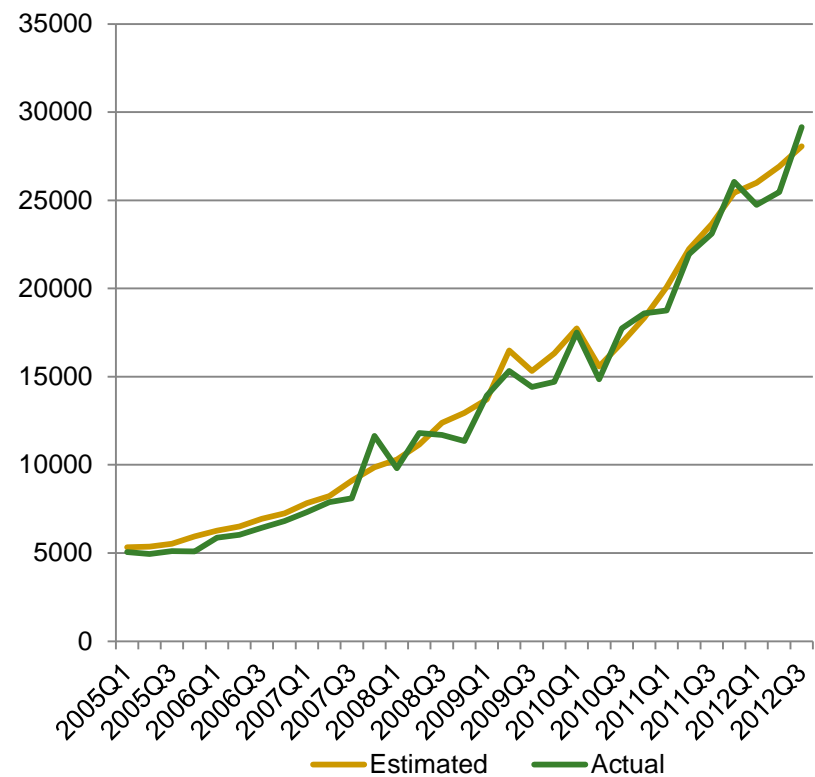
Budget revenues

$$GR = \delta_1 + \underbrace{0.53 GDP(-2)}_{(1.49)} + \underbrace{1.06 CPI}_{(1.95)} + \underbrace{0.001 UA_{SOMS}}_{(3.58)} + \underbrace{0.21 IM(-2)}_{(1.8)}$$



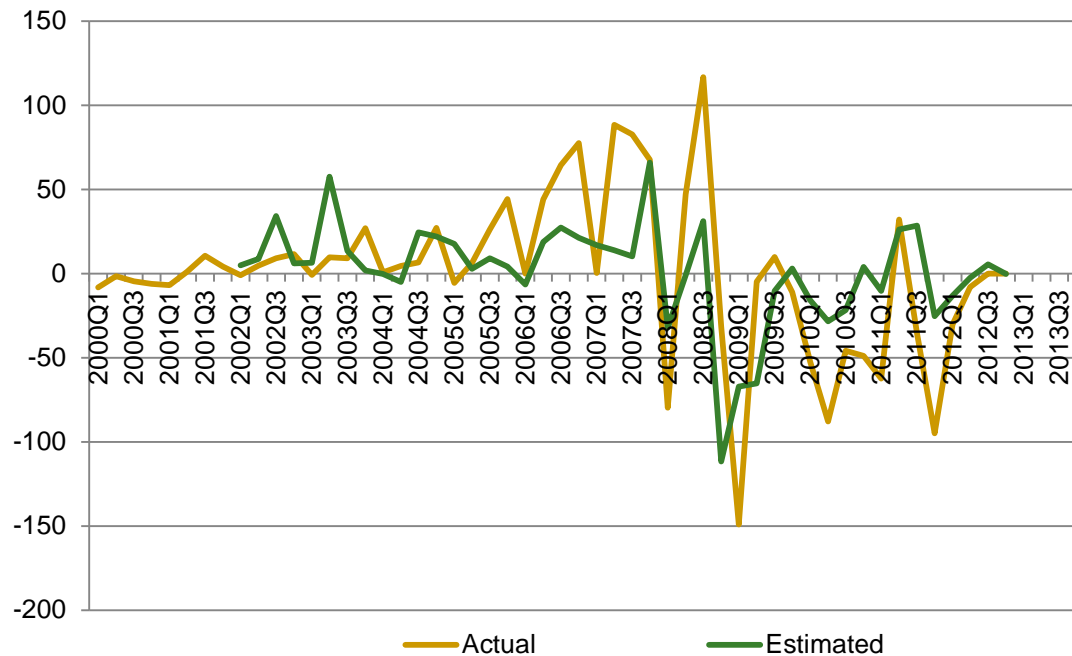
Budget expenditures

$$GE = \tau_1 + \underbrace{0.48 GR}_{(4.44)} + \underbrace{0.71 CPI(-3)}_{(2.72)} - \underbrace{0.69 AR(1)}_{(-6.06)}$$



Monetary sector: interventions

- Interventions behave asymmetrically



Concluding Remarks:

- Country specifics and data quality are impediments
- Main exogenous factors are: gold price, world commodity price index, Russian GDP.
- Appropriate results on external and budget sectors
- Monetary sector modeling is complicated due to *fiscal dominance* issue → capabilities to affect economy are still limited