Workshop on medium term projections
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An integrated approach for establishing public finance forecasts: a detailed view on expenditures (the case of Luxembourg)

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Institutionnal aspects (1)

- European semester governed from within an inter-ministerial «Forecasting Committee»
- Combine macro and public finance forecasts
- Dual approach which combines top down macro-modelling (STATEC) and bottom-up expertise by administrations (fiscal and spending)

Institutionnal aspects (2)

- Clear sequencing:
  - top down model-based forecasts with assumptions on public expenditures under unchanged policy assumptions;
  - Based on this model-outcome:
    - bottom-up estimates of revenues done by fiscal administrations;
    - NB: bottom–up (micro) approach brings new info not caught by model; important, especially in a small open, specialized economy (cf. financial sector);
    - model-generated estimates of revenues;
  - "Confrontation" exercise with an obligation to have coherent results ("no substantial deviations")
- Final result is a single medium term public finance forecast which is being used for policy-making (→ changed policy, SCP, end april)

Institutionnal aspects (3)

Unchanged policy:
- *Code of conduct (Sept. 2012): "Each Member State should appropriately define a scenario at unchanged policies and make public the involved assumptions, methodologies and relevant parameters." → need for national ownership*

LU guidelines:
- *If measures (laws) have been announced and can be quantified then they are going to be taken into account for the forecast (i.e Budget, tax laws, public investment plans);*
- *If a law has been voted regularly by the past and if the outcome of the law can be foreseen (estimated), then this effect is integrated in the forecast, even if the law has not been announced or voted (pension or minimum wage increases based on real wages, indexation or non-indexation of tax scales);*
- *If a law has been voted in the past but if the outcome is difficult to forecast or per se unforeseeable, not integrate an impact (real increases of public sector wages);*
- *If there exists an equation that explains well a given variable (for example, intermediate public consumption or public sector wages), take the outcome of the equation;*
- *In all other cases, take historic averages (unless good reasons not to do so).*

Institutionnal aspects (4)

- STATEC has published model-based forecasts for quite some time, but...
- ...model-based approach for public finance quite new for Luxembourg
- Big challenge ➜ work on modelling of expenditures and revenues...
- ...besides, for example, taking into account specificities for potential outpout (WGOG)
- ➜ big challenges, scarce ressources!

Modux (1)

- Macroeconometric model for Luxembourg
- 750 variables, 220 exogenous, 530 endogenous, of which 100 behavioural
- Yearly data, some series go back to 1970
- Can be simulated only from 2000 onwards
- Used for short to medium term forecasting (SCP), policy simulation (budgetary)
- Fairly detailed representation of public income and expenditure

Modux (2)

- Some specific features
    - models endogenously migrations and cross-border workers;
    - Potential GDP can be calculated endogenously (production function approach);
    - seperates banking sector (but no specific modelling wrt factors of production, production function);
    - GDP from the expenditure side: 13 behavioural equations;
    - Labour market: WS-PS (LNJ);
    - ECM form.

Modux (3)

- Some specific features
    - market share equations for exports (external demand from weighted imports) except financial exports; seperate metal goods and others
    - mark-up equation for value added prices
    - CES production function for each sector (banking and private non banking)
    - some kind of reduced demographic module (3 age categories)

Public expenditure equations (1)

- 12 variables modelled:
  - intermediate consumption, per capita wage cost, subsidies, social transfers (7 variables modeled separately, see below), other transfers, capital transfers
  - exogenous: employment, investment, debt charge
- Social transfers:
  - cash: pensions, health care, unemployment, family allowances, other
  - in kind: health care, old age dependency

Public expenditure equations (2)

- Ad-hoc approach, no theory
- Distinguish variables where institutionnal mechanism dominates and those where economic mechanism prevails
  - Insitutionnal: relation in (log-)levels (calibrated)
    - ex.: pensions, family allowances
  - Economic: ECM (estimated/calibrated)
    - ex.: unemployed benefits
- All variables in log form

Pensions

- In Lux, pensions are adapted to consumer price inflation and (in principle) to real wages
- Retain those two factors + number of pensioners
- Number of pensioners = exogenous ratio to (endogenous) population aged >= 65 years

	Short run	Long run
Inflation	NA	1.0
Real wages	NA	1.0
Number of pensioners	NA	1.0

Sick leave (cash)

- Essentially: absence from work (sick leave)
- ECM (some economic content or maybe adaptative behaviour)

	Short run	Long run
Employment	1.0	1.0
Nominal wage	0.88	1.0
Unemployment rate *	0.22*	NA

true elasticity on unemployment rate

Family allowances

- Indexed to inflation until 2006, then stopped
- Enormous structural modifications (usually improvements, but not all the time) ⇔ obtained by residual
- All explanatory variables exogenous for forecast (policy instruments)

	Short run	Long run
Beneficiaries	NA	1.0
Price inflation	NA	1.0
Structural elements	NA	1.0

Unemployment benefits

- Covers classical UE insurance + temporary unemployment + early retirement
- ECM, linked to resident employment, average wages and UE ratio
- Estimated (ECM)

	Short run	Long run
Resident employment	-1.3	1.0
Unemployment rate *	0.82	0.75
Nominal wage	1.0	1.0

true elasticity on unemployment rate

Other social transfers in cash

- Linked to nominal GDP in the long run

	Short run	Long run
Nominal GDP	NA	1.0
Real GDP	0.36	NA
Price inflation (consumer)	1.0	NA
Unemployment rate *	0.13	NA

* true elasticity on unemployment rate

Health care (in kind)

- Doctors, hospitals, medicine, etc…
- Identify price component (reimbursed part)
- Importance of age structure : POP6500 / POPTOT
- Lux: working population + migrants = young

	Short run	Long run
Target population §	NA	1.6
Own price inflation	NA	1.0
POP6500 / POPTOT	NA	2.5

§ total employment + number of pensioners

Old age dependency insurance

- Created in 1999
- Has not completely reached cruising speed
- Explained by beneficiaries and price inflation

	Short run	Long run
Number of beneficiaires	NA	1.0
Consumer price inflation	NA	1.0

Intermediate consumption

- Can be explained rather well by stock of public infrastructure and employment
    - ➜ Logic of «induced costs»
- Non homogeneity of RHS variables in the long run (sum of coefs > 1) ➜ autonomous drift

	Short run	Long run
Stock of public infrastructures	NA	0.73
Public investment	0.11; 0.17	NA
Public employment	1.18	0.88

Per capita nominal wage

- Two policy variables: inflation indexation (consumer prices) and discretionary real increases
- Private sector productivity emerges as an explaining variable in the LR (estimated)

	Short run	Long run
Inflation indexation	1.0	1.0
Real discretionary increases	1.0	1.0
Private sector labour productivity	NA	0.53

Policy instruments

- There is ample room for implementing / simulating policy changes:
  - inflation: indexation vs non-indexation
  - other discretionary adjustments (pensions, wages, family allowances)
  - targeted population (beneficiaries)
- Costs of detailed model:
  - hours of work to maintain / construct module
  - imperfection of demographic module