Medium term macroeconomic and public finances projections: the Italian experience

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Italian Ministry of Economy and Finance, Treasury Department

Outline of the presentation

- Setting the scene: the current projection methods
- A new baseline: a work in progress
- Simulation scenarios – two extreme cases:
  - +100 bp on yield curve
  - Tax wedge cut
- Further extensions on real-time potential growth and output gap estimates; structural external imbalances.
MEDIUM TERM PROJECTIONS FOR ITALY

Current Framework

- Based on long run demographic projections (Europop2010, Istat 2011)
- Cohort Simulation Model (CSM) for labour force projections
- Convergence to a pre-crisis NAWRU
- Convergence to 1% TFP growth in 2025
- Capital rule

CURRENT FRAMEWORK

Long-term projections: pension expenditures/GDP (DEF2012)
Debt/GDP projections: alternative assumptions (DEF 2012)

CURRENT FRAMEWORK

Shortcomings and need for further developments

- Medium to long term projections in Stability Programs – AWG Framework to project debt/GDP
  - Long Run approach
  - Difficult to use as a no-policy change scenario
  - Difficult to use for alternative scenarios
  - Difficult to use for simulating structural reforms different from pensions.

- Need to refine the analysis – a new baseline scenario for medium term projections in application of the Constitutional Amendment introducing a Budget Balance Fiscal Rule in Italy and in the Six Pack Stability and Growth Pact.
The Budget balance rule in constitution (L.C.1/2012) and the Secondary legislation (reinforced law – December 2012)

- Government balance in equilibrium in structural term → at the MTO
- Admissible government deficit/surplus depending of the phases of the cycle (Output gap)
- Significant deviations from MTO needs to be corrected immediately
- Definition of exceptional circumstances
- Application of the debt rule
- Application of the expenditure rule
- Sub-national level of government in equilibrium
- Creation of a fiscal council

Monitoring MTO + Debt/GDP developments on real time basis and on a medium term span

The Medium Term Scenario – a work in progress

- Reliance on the work developed at the Output Gap Working Group (work in progress)
- Refined public debt and primary balance projections
- Possibility to introduce shocks and simulate the impact of structural reforms
- Possible extensions to external imbalances (in progress)
Medium Term Scenario: projection strategy (1)

Update of DEF (Sept. 2012) - Baseline macroeconomic outlook

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
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<tbody>
<tr>
<td>Real GDP growth rate</td>
<td>-2.4</td>
<td>-0.2</td>
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<tr>
<td>Gross fixed capital formation (% ch.)</td>
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<tr>
<td>Labour productivity</td>
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<td>Unemployment rate</td>
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<tr>
<td>Employment growth</td>
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<tr>
<td>Hours worked (per employed) (% ch.)</td>
<td>-0.8</td>
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- **T+0 – T+3**: estimation of potential growth and output gaps with standard Production Function and Macro outlook from Update DEF (Sept 2012)

Medium Term Scenario: projection strategy (2)

- OGWG methodologies and assumptions
- **T+3 – T+5**: extrapolation of labour factor components (autoregressive methods and HP filter/mechanical), NAWRU in line with the OGWG methodology.
- **T+3 – T+10**: Participation rate (15-74) dynamic in line with Cohort Simulation Model – occupational effects of pension reform
- **T+6 – T+10**: NAWRU convergence to structural anchor; TFP, KF model; Capital Stock, convergence to a capital rule in T+15; constant Hours worked as T+6
- Linear Output Gap closure from T+3 (2016) to T+5 (2018)
Medium Term Scenario: projection strategy (3)

- T+3 – T+10: Primary balance /GDP moves in line with the gap closure rule and the change in age-related expenditures.

\[ PB_{T+i} = CAPB_{T+i-1} + \varepsilon \times OG_{T+i} + \Delta ARE_{T+i} \]

with \( i = 4 \ldots 10 \)

- Real interest rate: converging to 3% in t+5 constant afterwards
- GDP deflator (inflation): converging to 2% in t+5 constant afterwards

The baseline scenario: potential output projections

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<td>Potential output growth</td>
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<tr>
<td>Labor</td>
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<td>0.0</td>
<td>0.1</td>
<td>0.4</td>
<td>0.5</td>
<td>0.6</td>
<td>0.7</td>
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<td>0.3</td>
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<tr>
<td>Total Factor Productivity</td>
<td>-0.3</td>
<td>-0.2</td>
<td>-0.1</td>
<td>-0.1</td>
<td>0.0</td>
<td>0.1</td>
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<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.3</td>
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<tr>
<td>Output gap</td>
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<td>-2.8</td>
<td>-2.7</td>
<td>-1.7</td>
<td>-1.1</td>
<td>-0.6</td>
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</table>
The baseline scenario: potential output projections

GDP growth


The baseline medium term projections

Primary surplus and debt-GDP developments

DEBT/GDP (scale on the right)
Primary Balance (% GDP)
Simulation Scenarios: two extreme cases

- Projection strategy: shocks from different models are added to the Baseline
- Extreme cases in terms of effects and duration of the shocks

- **Scenario 1:** +100 bp on yield curve from 2012 to 2018 and afterwards
  - Macro+fiscal shocks on Public Finance → (macro-econometric model ITEM & interest expenditures simulation model)

- **Scenario 2:** 10% cut in Tax wedge and administrative costs
  - Structural Reforms assessment → IGEM (DSGE model)
Scenario 1: +100 bp on yield curve – estimation strategy (2)

Shock +100 bp – ITEM model
Change with respect to the baseline

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<th>2012</th>
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<th>2014</th>
<th>2015</th>
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<tbody>
<tr>
<td>Real GDP growth</td>
<td>-0.1</td>
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<td>-0.1</td>
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<tr>
<td>Gross fixed capital formation (% ch)</td>
<td>-0.1</td>
<td>-1.6</td>
<td>-2.1</td>
<td>-1.7</td>
</tr>
<tr>
<td>Employment (%)</td>
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<td>-0.1</td>
<td>-0.3</td>
<td>-0.3</td>
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<tr>
<td>Hours worked</td>
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<td>-0.3</td>
<td>-0.3</td>
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<td>Active population</td>
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<td>0.0</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>0.0</td>
<td>0.1</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>-0.1</td>
<td>-0.3</td>
<td>-0.2</td>
<td>0.2</td>
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<tr>
<td>Private consumption deflator</td>
<td>0.0</td>
<td>-0.1</td>
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<td>-0.4</td>
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<tr>
<td>GDP deflator</td>
<td>0.0</td>
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<tr>
<td>Wage growth</td>
<td>0.0</td>
<td>-0.1</td>
<td>-0.3</td>
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- T+0 – T+3: estimation of potential growth and output gaps with standard Production Function and Macro outlook from Update DEF revised according to the shock results

Scenario 1: +100 bp on yield curve – estimation strategy (3)

MACRO ASSUMPTIONS

- T+6 – T+10: the negative effect on gross fixed capital investment (-1.7% vis-à-vis the baseline) is gradually being reduced.

- T+6 – T+10: the average negative effect on GDP growth (-0.3% over 2012-2015) is assigned to TFP and gradually reduced by the end of the projection period.
Scenario 1: +100 bp on yield curve – estimation strategy (4)

FISCAL ASSUMPTIONS

- **T+0 – T+3**: The cyclically adjusted primary balance is given by the difference between the cyclically-adjusted revenue and expenditures as a deviation from the baseline

\[
\text{revenue}^{ta}_{T+i} = \left(\frac{R^{ua}}{Y} \right) \cdot \left(\frac{p_{T+i}}{p_{T}}\right) \cdot \left[1 + \epsilon_p \cdot \left(\frac{\bar{p}_T - \bar{p}_0}{Y_{T+i}}\right)\right]
\]

\[
\text{expenditure}^{ta}_{T+i} = \left(\frac{E^{ua}}{Y} \right) \cdot \left(\frac{p_{T+i}}{p_{T}}\right) \cdot \left[1 + \epsilon_e \cdot \left(\frac{\bar{p}_T - \bar{p}_0}{Y_{T+i}}\right)\right]
\]

- **T+6 – T+10**: Primary balance/GDP moves in line with the gap closure rule and the change in age-related expenditures.

\[
P_{B_{T+i}} = CAP_{B_{T+i-1}} + \epsilon \cdot OG_{T+i} + \Delta ARE_{T+i}
\]

Scenario 1: +100 bp on yield curve – estimation strategy (5)

PUBLIC DEBT

- Estimation through an ad-hoc model that projects the composition and the duration of the current stock of public debt.

- **T+0 – T+6**: Interest expenditure/GDP increases exponentially from 0 (in T+0) to 0.8% of GDP in (T+6) to remain constant to this level afterwards.

- Implicit interest rate increases on average by 0.3 p.p over T+0 – T+3 and reaches 6.2% in T+6 and then declines slightly afterwards.
Scenario 1: +100 bp on yield curve – some results (5)

Real GDP growth

Primary balance

Scenario 2: Structural reforms - a taw wedge cut

IGEM

Baseline PF

Structural reforms

Primary Surplus

DEBT

HP: Permanent shock (reduction of 10pp) on overhead labor costs and of wage markup so to obtain in the medium term a 1% deviation of GDP deflator and nominal wages with respect to the baseline.
### Scenario 2: Tax Wedge cut – estimation strategy (1)

**Shock:** -10% Tax Wedge – NIGEM

*Change with respect to the baseline*

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<tr>
<td>GDP deflator</td>
<td>-0.5</td>
<td>0.0</td>
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<td>-0.1</td>
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<tr>
<td>Consumption deflator</td>
<td>-0.3</td>
<td>-0.1</td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td>Wage growth</td>
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<td>0.0</td>
<td>0.1</td>
<td>0.1</td>
</tr>
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<td>-0.5</td>
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<tr>
<td>Employment growth</td>
<td>0.1</td>
<td>0.2</td>
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<tr>
<td>Hours worked (per employed) (% ch.)</td>
<td>0.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
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</tbody>
</table>

- **T+0 – T+3:** estimation of potential growth and output gaps with standard Production Function and Macro outlook from Update DEF (Sept 2012)

### Scenario 2: Tax Wedge cut – estimation strategy (2)

**MACRO ASSUMPTIONS**

- Transposition of IGEM results on structural and anchors

- **T+6 – T+10:** increase gross fixed capital investment is reabsorbed slowly – convergence to capital rule only in 2035

- **T+6 – T+10:** the average positive effect on GDP growth (0.3% over 2012-2023) is assigned to TFP growth and gradually reduced afterwards

- Tax wedge parameter in panel anchor NAWRU is reduced by 10pp
Scenario 2: Tax Wedge cut – estimation strategy (3)

FISCAL ASSUMPTIONS

- **Strong assumption:** no second-round effects from measures to finance the reform
- **T+0 – T+3:** The cyclically adjusted primary balance is given by the difference between the cyclically-adjusted revenue and expenditures as a deviation from the baseline
  \[
  \text{revenue}_{T_i}^{ca} = \left( \frac{R_{T_i}}{Y_{T_i}} \right) \cdot \left( \frac{V_{T+3}}{V_{T+3_i}} \right) \cdot \left[ 1 + \epsilon_\theta \cdot \left( \frac{V_{T+3} - V_{T+3_i}}{V_{T+3_i}} \right) \right]
  \]
  \[
  \text{expenditure}_{T_i}^{ca} = \left( \frac{E_{T_i}^{ca}}{Y_{T_i}} \right) \cdot \left( \frac{V_{T+3}}{V_{T+3_i}} \right) \cdot \left[ 1 + \epsilon_\theta \cdot \left( \frac{V_{T+3} - V_{T+3_i}}{V_{T+3_i}} \right) \right]
  \]
- **T+6 – T+10:** Primary balance /GDP moves in line with the gap closure rule and the change in age-related expenditures.
  \[
  PB_{T+4} = \text{CAPB}_{T+4} - \epsilon \cdot G_{T+4} + \Delta ARE_{T+4}
  \]

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Scenario 2: Tax Wedge cut – some results (4)
Simulation result: Debt/GDP and potential growth rate

COMPARISON ACROSS SCENARIOS

CONCLUDING REMARKS

Medium Term scenarios – some concluding remarks

- Need to improve fiscal projections to include second round effects
- Fiscal Multipliers? Change in underlying parameters?
- More refined solutions to deal with structural reforms
- Definition of country specific parameters for structural determinants
- Further extensions on real-time potential growth and output gap estimates; structural external imbalances.