Measuring impact of EFSI in a CGE framework: the case of RHOMOLO

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“Micro- and macro-based methods in assessing the impact of investment”
Brussels, 5 April 2017
Why a macroeconomic assessment

Looking beyond the direct effects of EIB supported activities
Why a macroeconomic assessment
Looking beyond the direct effects of EIB supported activities

EIB Group financing

Source: EIB Annual Press Conference 2016
Why a macroeconomic assessment

Looking beyond the direct effects of EIB supported activities

- **JOBS**: 4.4m jobs in small businesses
- **HEALTH**: 10m people with access to improved health services
- **EDUCATION**: 890 000 students benefiting from EIB projects
- **TRANSPORT**: 960m additional passengers
- **ENERGY**: 4m households powered by EIB projects
- **URBAN**: 120 000 households in social and affordable housing

Source: EIB Annual Press Conference 2016
Impact assessment

What modelling framework?

- Indirect and induced effects are not directly observable and require a careful analytical framework: economic model.
- The model should include crucial elements to address the problem, including main economic agents, relations and behavioral principles.
- Modelling assumptions should be well-recognized by scholars and practitioners.
- Keep the balance between applicability and complexity.
- Important to track on short- and long-term effects.
- Be able to recognize the caveats and provide sensitivity analysis to different modelling shortcomings.
- A good model is better than no model but not better than any model.
(stylized) EIB business model

Investment effect

Direct economic effects (investment)
- financing

Indirect economic effects in supplier industries

Second round effect increase of income, spending on all sect.

Growth effects increase GDP and employment

Structural effect

Travel costs saved, More and better RnD, Higher Human capital, Etc.

Increase of factor productivity (sectoral and total)

Structural change in IO-table and trade changes
The model: RHOMOLO

Model setup

Households
- High-skill labour
- Medium skill labour
- Low-skill labour
- Public capital

Regional government

Foreign and public savings

Domestic/foreign savings

Investments

Physical capital stock

Final goods firms

Final demand (hh, inv, gov, all regions)

Intermediates inputs (all regions)
The model: RHOMOLO

Model setup: demand effects
The model: RHOMOLO
Model setup: structural effects
### NACE Rev. 2 sectors

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Agriculture, Forestry and Fishing</td>
</tr>
<tr>
<td>B, D, E</td>
<td>Mining and Quarrying + Electricity, Gas, Steam and Air Conditioning Supply + Water Supply; Sewerage, Waste Management and Remediation Activities</td>
</tr>
<tr>
<td>C</td>
<td>Manufacturing</td>
</tr>
<tr>
<td>F</td>
<td>Construction</td>
</tr>
<tr>
<td>G-I</td>
<td>Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles + Transportation and Storage + Accommodation and Food Service Activities</td>
</tr>
<tr>
<td>J</td>
<td>Information and Communication</td>
</tr>
<tr>
<td>K</td>
<td>Financial and Insurance Activities</td>
</tr>
<tr>
<td>L</td>
<td>Real Estate Activities</td>
</tr>
<tr>
<td>M-N</td>
<td>Professional, Scientific and Technical Activities + Administrative and Support Service Activities</td>
</tr>
<tr>
<td>O-Q</td>
<td>Public Administration and Defence; Compulsory Social Security + Education + Human Health and Social Work Activities</td>
</tr>
<tr>
<td>R-U</td>
<td>Arts, Entertainment and Recreation + Other Service Activities + Activities of Households As Employers; Undifferentiated Goods- and Services-Producing Activities of Households for Own Use + Activities of Extraterritorial Organisations and Bodies</td>
</tr>
</tbody>
</table>

### NUTS2 regions (Transport accessibility index example)
## RHOMOLO

### Regional database: example

| Year | LUDD | Agricul | ManuCon | TrTrade | BusServ | OthServ | RnD | Kap | Lab_L | Lab_M | Lab_H | Lab_RnD | Tax_Lab_L | Tax_Lab_M | Tax_Lab_H | Tax-Prod | Households | Government | Investor | Exp-EU | Exp-RoW |
|------|------|---------|---------|---------|---------|---------|-----|-----|-------|-------|-------|---------|-----------|-----------|----------|----------|----------|----------|----------|----------|
| 2010 | 123.4| 8256.8  | 2415.4  | 1277.8  | 1162.8  | 54.0    | 3096.3| 727  | 4.1   | 2.2   | 185.4  | 2358.3  | 6203.9    | 5135.3    | 2659.7   | 363.1    | 0.0      | 2.8      | 184.2    | 9.8      |
| 2011 | 145.2| 1252.5  | 3813.8  | 10841.4 | 1142.2  | 8.6     | 965.9 | 706.3| 358.3 | 343.4 | 1.0    | 984.5   | 2485.2    | 5135.3    | 2659.7   | 363.1    | 0.0      | 2.8      | 184.2    | 9.8      |

### Notes:
- **Agricul**: Agricultural sector
- **ManuCon**: Manufacturing
- **TrTrade**: Transport and trade
- **BusServ**: Business services
- **OthServ**: Other services
- **RnD**: Research and development
- **Kap**: Capital stock
- **Lab_L**: Labour in the low-skilled sector
- **Lab_M**: Labour in the medium-skilled sector
- **Lab_H**: Labour in the high-skilled sector
- **Tax_Lab_L**: Tax paid by low-skilled labour
- **Tax_Lab_M**: Tax paid by medium-skilled labour
- **Tax_Lab_H**: Tax paid by high-skilled labour
- **Tax-Prod**: Tax on production
- **Households**: Households
- **Government**: Government sector
- **Investor**: Investor sector
- **Exp-EU**: Exports to EU
- **Exp-RoW**: Exports to ROW

### Additional Data:
- **LUDD**: Local Unit of Domestic Output and Distribution
- **EU**: European Union
- **RoW**: Rest of the World
Example of typical demand and structural effects in open economies

Regional trade openness

<table>
<thead>
<tr>
<th>Share of GDP</th>
<th>Import</th>
<th>Export</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rest of IT</td>
<td>31%</td>
<td>24%</td>
</tr>
<tr>
<td>ROW</td>
<td>18%</td>
<td>11%</td>
</tr>
<tr>
<td>RestEU</td>
<td>18%</td>
<td>11%</td>
</tr>
</tbody>
</table>

GDP impacts of ERDF T01 and T04 investments in Apulia, by demand component, percent deviations from baseline. Demand (left pane) and structural (right pane) effects.
Example of typical demand and structural effects

Demand and structural effects on GDP in Apulia, percent change from baseline
Example of typical demand and structural effects

Percentage deviation for a set of key macroeconomic indicators in Apulia due to the policy funding of TO1 and TO4 objectives
Macroeconomic impact of EIB activities

Pilot: assessing EIB impact during the capital increase.

Assessing EIB impact during the capital increase.

- Scope: all lending operations between January 2013 and March 2015
- Effects over 2010 baseline
- Full project investment costs
- All loans fully financed and repaid

**EIB Operations**
(January 2013 – March 2015)

Investments supported through EIB operations

**EUR 372bn**

**Short-term impact**
(by 2017)

- Additional GDP 0.8%
- Additional employment 830 000 jobs

**Long-term**
(by 2030)

- Additional GDP 1.1%
- Additional employment 1 400 000 jobs
Next steps in model fine-tuning

- Finalising methodology choices for:
  - Turning investment data into:
    - Investment-induced demand shocks;
    - Investment finance;
    - Structural shocks.

- Identifying elasticities of structural parameters to investments;

- Run robustness checks and sensitivity analyses.
Thank you for your attention

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