Monthly forecasting of French GDP: a revised version of the OPTIM model

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Monthly forecasting of French GDP: a revised version of the OPTIM model

1. Description of OPTIM

2. Modelling strategy and data selection

3. Results

4. Conclusion
1. Description of OPTIM

*The main characteristics*

- Bridge model created by Irac and Sédillot (2002)
- Forecasts for French GDP and its components for the current quarter (and for the next one, in a forthcoming version)
- Based on monthly indicators (survey data and hard data)
- Used at the Banque de France, coupled with the structural macroeconomic model Mascotte or separately
1. Description of OPTIM

*A revised version of the model*

- New equations
- Monthly forecasts (previously quarterly forecasts)
- Systematic data selection using Gets
2. Modelling strategy and data selection

*Modelled components (1/3)*

- French GDP quarterly growth rate + GDP components quarterly growth rate
- Some components are not modelled (production of non market services, immaterial investment, changes in inventories)
- Aggregation with equations
A. On the demand side:

- Household consumption, computed by aggregation of the forecasts for:
  - Household consumption in agri-food goods
  - Household consumption in energy
  - Household consumption in manufactured goods
  - Household consumption in services

- Government consumption

- Investment, computed by aggregation of the forecasts for:
  - Corporate investment in machinery and equipment
  - Corporate investment in building
  - Household investment
  - Government investment

- Exports

- Imports
B. On the supply side:

• Total Production, computed by aggregation of the forecasts for:
  Production of agri-food goods
  Production of manufactured goods
  Production of energy
  Production in construction
  Production of market services

C. Total GDP is forecast using a regression on total production.
2. Modelling strategy and data selection

*Monthly exercises*

- 3 forecasts for each quarter
- After the publication of Insee and EC surveys and before the ECB « monetary » Governing Council
- Different equations can be used for the different forecasts of a component
- When data are missing for some months of the last quarter, the value for the quarter is computed as the 3-month moving average of the last available observations
2. Modelling strategy and data selection

The data set (1/3)

• Monthly or higher frequency data
• Soft (survey) data and hard data
• Recent information (less than 2 months)
## 2. Modelling strategy and data selection

*The data set (2/3)*

<table>
<thead>
<tr>
<th>Name</th>
<th>Source</th>
<th>Data type</th>
<th>Frequency</th>
<th>Publication lag</th>
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</table>
2. Modelling strategy and data selection

*The data set (3/3)*

- **January**
  - Nov. IPI
  - Dec. BdF survey
  - Dec. cons. in manuf. goods
  - Jan. Insee and EC surveys

- **February**
  - Dec. IPI
  - Jan. BdF survey
  - Jan. cons. in manuf. goods
  - Feb. Insee and EC surveys

- **March**
  - Jan. IPI
  - Feb. BdF survey
  - Feb. cons. in manuf. goods
  - Mar. Insee and EC surveys

- **April**
  - Feb. IPI
  - Mar. BdF survey
  - Mar. cons. in manuf. goods
  - Apr. Insee and EC surveys

- **May**
  - Mar. IPI
  - Apr. BdF survey
  - Apr. cons. in manuf. goods
  - May Insee and EC surveys

- **Q4 GDP release**
  - Jan.
  - Insee and EC surveys

- **Q1 GDP release**
  - Feb.
  - Insee and EC surveys

- **1st forecast for Q1**
  - Feb.
  - BdF survey
  - cons. in manuf. goods

- **2nd forecast for Q1**
  - Mar.
  - BdF survey
  - cons. in manuf. goods

- **3rd forecast for Q1**
  - Apr.
  - BdF survey
  - cons. in manuf. goods
2. Modelling strategy and data selection

*General specification of the equations*

- Autoregressive-distributed-lag (ADL) bridge equations

\[ Y_t = \alpha + \sum_{i=1}^{m} \beta_i Y_{t-i} + \sum_{j=1}^{q} \sum_{i=1}^{k} \delta_{j,i} X_{j,t-i} + \varepsilon_t \]
2. Modelling strategy and data selection

Data selection procedure (1/2)

• Systematic data selection using Gets
• Preselection of explanative variables strongly correlated with the modelled variable but not with each other
• No mix between similar data sources
• No use of synthetic survey indicators
• Selection of a first set of equations with an emphasis on economic content
• Final selection with rolling forecasts, taking into account the data availability
2. Modelling strategy and data selection

Data selection procedure (2/2)

- Selection of a main data source
- Preselection of variables based on correlations
- Selection of variables with Gets
- Refinement of equations
- Selection of a complementary data source
- First set of equations
- Rolling forecasts
- Final set of equations
2. Modelling strategy and data selection

Tests implemented in Gets

- Godfrey (1978) Lagrange multiplier test for serial correlation in the residuals up to 5 lags [LM(5)]
- Doornik and Hansen (1994) normality test [DH]
- Nicholls and Pagan (1983) test for quadratic heteroscedasticity between regressors [NP]
- Chow in-sample predictive failure test on 50% [Chow(50%)] and 90% [Chow(90%)] of the sample
- Belsley, Kuh, and Welsch (1980) multicollinearity diagnostic [BKW]
3. Results

GDP forecasts
## 3. Results

### Root Mean Squared Errors

<table>
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<th>Third</th>
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<tr>
<td>without IPI</td>
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</tbody>
</table>
3. Results

*Diebold-Mariano tests against the AR model*

- Diebold Mariano tests against the AR model
- Modified version by Harvey, Leybourne and Newbold (1997), not presented in the paper

<table>
<thead>
<tr>
<th>Component</th>
<th>First</th>
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<th>Third</th>
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<tbody>
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4. Conclusion

- Satisfying results given the comparisons with benchmarks
- Next step: future quarter forecasts
- Problems concerning the aggregation of forecasts for GDP components