Determinants of macroeconomic resilience in the euro area: An empirical assessment of policy levers

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2d Conference on structural reforms IMF-OECD-World Bank
September 12, 2019, Washington

Disclaimer: The authors are writing in their personal capacity and their opinions should not be attributed to the European Commission.
Real GDP level
(2008=100)

Notes: EA=Euro area, EA hardest hit= Cyprus, Greece, Ireland, Portugal and Spain
Source: Eurostat
Why is economic resilience so important in the euro area?

- **Necessary** (but not sufficient) to
  - absorb economic shocks via *internal adjustment*
  - reduce *amplitude and persistence* business cycle
  - Promote convergence across euro area
- **Short-term gains**
  - less unemployment, higher income, …
- **Long-term gains**
  - averts hysteresis risks *(Labour market, capital formation …)*
  - averts socio-political risks *(political support for reforms, …)*
  - creates incentives to invest, innovate, compete, grow, …
Overall objective: assess determinants of macroeconomic resilience in the face of common shocks
Economic resilience framework: Components of resilience

Vulnerability (i.e. likelihood being hit by a shock)

Absorption (i.e. ability to cushion the impact of shock)

Recovery (i.e. persistence of the effects of shock)

Potential growth

RESILIENCE

CONVERGENCE (cyclical and real)
Methodologies to evaluate the impact of structural features

I. Estimation of common shocks (17 countries)

II. a) Panel regression (17 countries, 20 explanatory variables): reduced form output gap equation

\[ Y_{i,t} = \beta \, SHOCK\_C_t + \sum_{l=1}^{k} \beta_l \, Z_{i,l,t} \, SHOCK\_C_t \]

- impact of common shock + structural factors affecting its absorption

\[ + \alpha Y_{i,t-1} + \sum_{j=1}^{k} \alpha_j Z_{i,j,t} \, Y_{i,t-1} \]

- recovery from past output gaps + structural factors affecting recovery

\[ + \sum_{m=1}^{n} \gamma_{i,m} (Q_{i,m,t} - \bar{Q}_{i,m}) + u_{i,t} \]

- impact macro-economic policy variables + stochastic component

II. b) Bayesian Model Averaging (BMA) in panel (40 + variables)
Variables by category in the econometric analysis

Disaggregated level

- **Labour markets** – employment protection legislation, Labour Market policies such as training, public employment services (PES), composition, …

- **Product markets / business environment** – product market regulation related to barriers to domestic and foreign entry and state involvement such as price control (OECD PMR)

- **Financial markets** – bank competition (WB Lerner-index), Non-performing loans (NPL), …

- **Institutional quality** - corruption, rule of law, …

- **Structural factors** - diversification of production, economic openness, …

- **Macroeconomic conditions** - interest rate, real effective exchange rate,…
Results: by drivers

Factors affecting **ABSORPTION** of common shocks (2008-2014)

Factors affecting **RECOVERY** from common shocks (2008-2014)

Source: Based on QREA III-2018
Results: Bayesian Modelling Averaging

Factors affecting **ABSORPTION** of common shocks (2008-2014)

Factors affecting **RECOVERY** from common shocks (2008-2014)

Higher value = probability indicating that the variable belongs to the true model.

Source: Based on QREA III-2018
Conclusion

• Determinants of macroeconomic resilience in the face of common shocks at a more disaggregated level can provide some guidance for structural reforms.
• Notable differences among the euro area Member States, with regards to absorption and recovery too.
• Absorption and recovery capacity not always in sync.
• The functioning of markets - well-functioning product and financial markets - appear as key determinant of resilience.
Thank you!

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Recent publications on economic resilience by the European Commission

- 'How to make the Economic and Monetary Union more resilient?' QREA 2016, Vol 15, N.3
- 'Sustainable convergence in the euro area: A multidimensional process' QREA 2017 Vol. 16, No. 3
- 'Economic Resilience, the Single market and EMU', QREA 2018, Vol. 17, No. 1
### Results: Panel regression

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Results: by countries

**ABSORPTION** capacity of common shocks (2008-2014)

Higher value = weaker absorption

**RECOVERY** capacity from common shocks (2008-2014)

Higher value = slower recovery

Source: Based on QREA III-2018
Data: some examples

Data sources for 40+ variables: EC, OECD, WORLD BANK, ICTWSS

Expenditure on PES and training

Gross non-performing debt instruments

Trade openness and export diversification
Empirical approach

- I. Estimation of common shocks (17 countries)

\[ dln(GDP_{i,t}) = \delta_t DUM_t + \rho_i DUM_i + \nu_{i,t} \]
Empirical approach

- II.a) Panel regression (17 countries, 20 explanatory variables)
  - Reduced form output gap equation:

  \[ Y_{i,t} = \beta \text{SHOCK}_C t + \sum_{l=1}^{k} \beta_l Z_{i,l,t} \text{SHOCK}_C t \]

  \[ \text{impact of common shock} + \text{structural factors affecting its absorption} \]

  \[ + \alpha Y_{i,t-1} + \sum_{j=1}^{k} \alpha_j Z_{i,j,t} Y_{i,t-1} \]

  \[ \text{recovery from past output gaps} + \text{structural factors affecting recovery} \]

  \[ + \sum_{m=1}^{n} \gamma_{i,m} \left(Q_{i,m,t} - \bar{Q}_{i,m} \right) + u_{i,t} \]

  \[ \text{impact macro-economic policy variables} + \text{stochastic component} \]

- Degrees of freedom
- Multicollinearity/simultaneity: significance/bias
Empirical approach

• II.b) Bayesian Model Averaging (BMA) in panel (40 + variables)
  • Many potential explanatory variables (not feasible in one regression, nor sequential testing)
  • The robustness of a variable in explaining the dependent variable can be expressed by the probability that a given variable is included in the regression. Variable ranking by posterior inclusion probability (robust determinants)

\[
p(M^y|Y_{i,t_i},Z_{i,t}) \propto p(Y_{i,t}|M^y, Z_{i,t}) p(M^y)
\]

\[
p(\theta|M^y,Y_{i,t_i},Z_{i,t}) = \sum_{y=1}^{2^K} p(\theta|M^y,Y_{i,t_i},Z_{i,t}) \frac{p(M^y|Y_{i,t_i},Z_{i,t}) p(M^y)}{\sum_{j=1}^{2^K} p(Y|M_j,Z_{i,t}) p(M_j)}
\]

\[
PIP = p(\beta^y \neq 0|y) = \sum_{\beta^y \neq 0} p(M^y|y)
\]