Europe 2020 targets: Redefining linkages and a modified inequality index

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Agenda

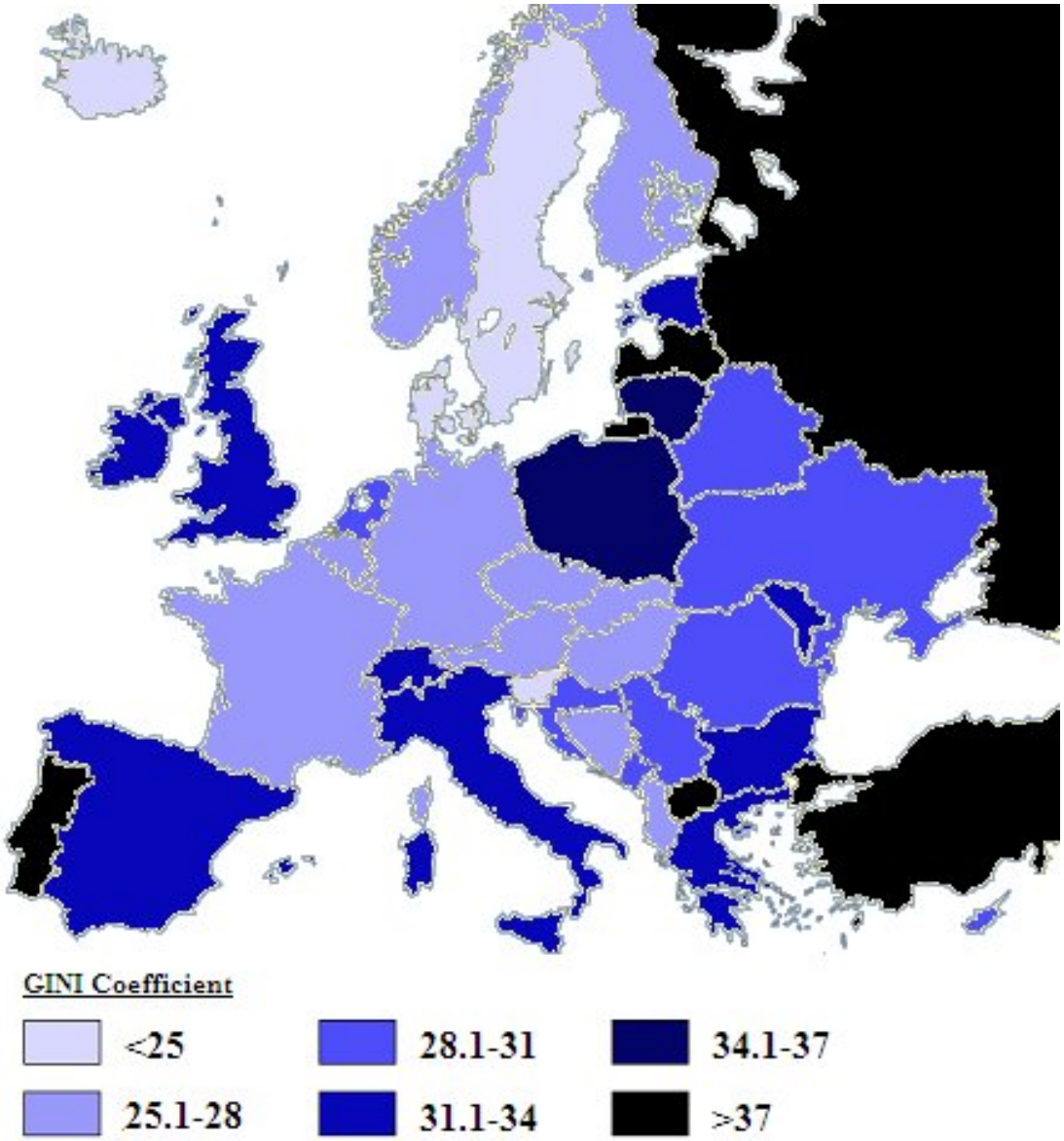
- Rising income inequalities in Europe
- Modified Inequality Index: what's government benefits got to do with it?
- Main problem
- Redefining Euro-zone Inequality Linkages: An Innovative Proposal
- Global Macroeconomic Modelling: a novel approach to analyse income inequalities
- Dynamic Analysis Results
- Preliminary Conclusions

Motivation and Policy Revelance

...An imbalance between rich and poor is the oldest and most fatal ailment of all republics...Plutarch

- Income inequalities - a crucial challenge for the EU
- In the light of current structural changes, modified inequality index (MQ) is designed to have a fresh look at the inequality developments in Europe.

National income inequalities in the EU, Gini, 2012



Source: Eurostat

Modified Inequality Index: Just How Unequal?

- Take into account the moderating effect of in-kind government benefits. Such index includes the income quintile share ratio (the S80/S20 ratio) government consumption expenditures, GDP and total tax revenue as a percent of GDP, and calculated as below:

$$SG = \frac{G}{GDP(1-T)} \tag{1}$$

$$MQ = \frac{S80/S20}{1+SG} \tag{2}$$

- **Stack 1978**→ The redistribution role played by government through the provision of public services is significant and should be taken into account when calculating the Gini index.
- **Aaberge *et al.*, 2010** → Neglecting in-kind transfers when measuring income, gives an incomplete picture of the distribution of economic inequality.

Individual Country Model

$$x_{it} = \mathbf{a}_{i0} + \mathbf{a}_{i1}t + \Phi_{i1}x_{i,t-1} + \Lambda_{i0}x^*_{it} + \Lambda_{i1}x^*_{it-1} + \mathbf{u}_{it}$$

- $N+1$ countries, indexed by $i = 0, 1, ..., N$.
- Dataset encompasses 17 EU countries, and covers a time span period of 1996Q1-2012Q1.
- Vector of domestic variables $x_{it} = [y_{it}, \Pi_{it}, sr_{it}, mq_{it}, pov_{it}]'$

Regions:

Highly Vulnerable: Greece,Hungary and Estonia.
Vulnerable: Portugal, Italy and Spain.
Unbalanced: France, United Kingdom, and Ireland.
Balanced: Sweden, Finland, Germany, and Belgium.
Leading: Netherlands, Denmark, Luxembourg and Austria.

Main Questions

- Does economic performance matter for income inequalities?
- Does inflation help to account for a significant component of the historical cyclical variation in income inequality?
- Is there a significant pass-through of monetary policy shocks to income inequalities?
- Does trade and monetary integration in Europe entail the risk of widening income inequalities between regions?
- Are income inequalities persistent and to what extent they pose challenges to policy makers by causing a rise in at risk of poverty rates?

Technical Framework Cont'd: Linking Countries

- Linkage between the country and the rest of the world

$$\mathbf{x}^*_{it} = \Sigma w_{ij} \mathbf{x}_{jt}$$

- e.g.

$$\mathbf{x}^*_{1,1t} = w_{12} \mathbf{x}_{2,1t}$$

$$\begin{bmatrix} \mathbf{X}_{1,1t} \\ \mathbf{X}_{1,2t} \\ \mathbf{X}^*_{1,1t} \\ \mathbf{X}^*_{2,2t} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & w_{12} & 0 & w_{13} & 0 \\ 0 & 0 & 0 & w_{12} & 0 & w_{13} \end{bmatrix} \begin{bmatrix} \mathbf{X}_{1,1t} \\ \mathbf{X}_{1,2t} \\ \mathbf{X}_{2,1t} \\ \mathbf{X}_{2,2t} \\ \mathbf{X}_{3,1t} \\ \mathbf{X}_{3,2t} \end{bmatrix} \quad (3)$$

- Trade:

$$T_{i,j} = \frac{\bar{X}_{i,j} + \bar{M}_{i,j}}{\sum_{j=1}^{N-1} \bar{X}_{i,j} + \sum_{j=1}^{N-1} \bar{M}_{i,j}} \tag{4}$$

- Migration:

$$M_{i,j} = \frac{0.3 * M_{i,j,1990} + 0.7 * M_{i,j,2000}}{0.3 * \sum_{j=1}^{N-1} M_{i,j,1990} + 0.7 * \sum_{j=1}^{N-1} M_{i,j,2000}}$$

- International Investments:

$$F_{i,j} = \frac{\bar{out}_{i,j} + \bar{inw}_{i,j}}{\sum_{j=1}^{N-1} \bar{out}_{i,j} + \sum_{j=1}^{N-1} \bar{inw}_{i,j}} \tag{5}$$

- Geographic Proximities

$$W_{i,j} = \frac{1}{(dist_{i,j})} \tag{6}$$

Different weights are assigned to their respective indexes which leads to a more sensible composite weight matrix reflecting, by the means of key indicators, the relative importance each individual economy represents towards each other in the sample.

$$Z_{i,j} = 0.05W_{i,j} + 0.35T_{i,j} + 0.35F_{i,j} + 0.25M_{i,j} \tag{7}$$

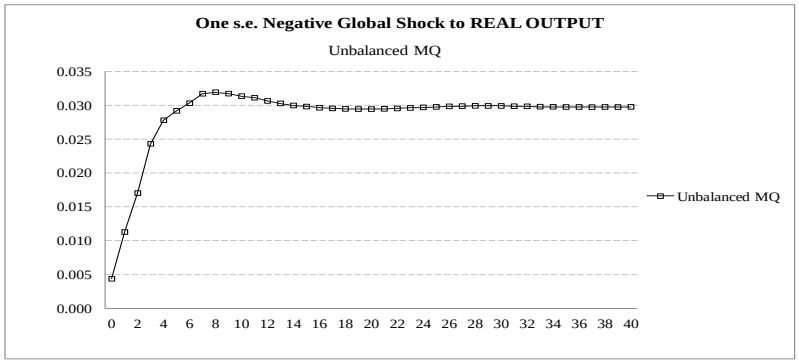
$$\Rightarrow \mathbf{Z} = [0.05\mathbf{W} + 0.35\mathbf{T} + 0.35\mathbf{F} + 0.25\mathbf{M}] \tag{8}$$

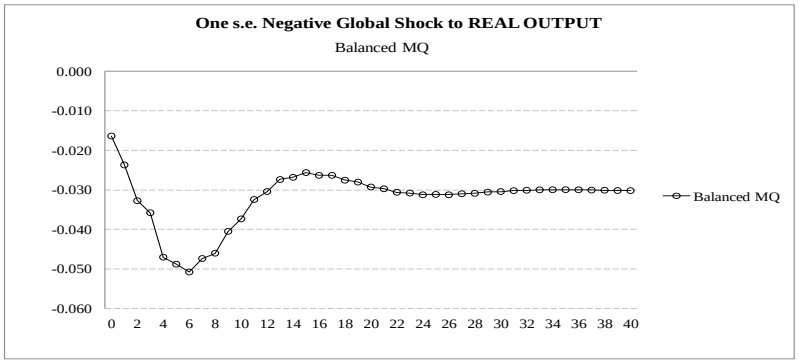
with $Z_{i,i} = 0$ being a result of the null diagonals in all of the constituent matrices. For the purposes of estimations these weights have been column-normalised.

Spillover of Real Shocks

To what extend income inequalities are effected by negative economic performance shocks?

Figure : GIRF of a global shock to Real Output





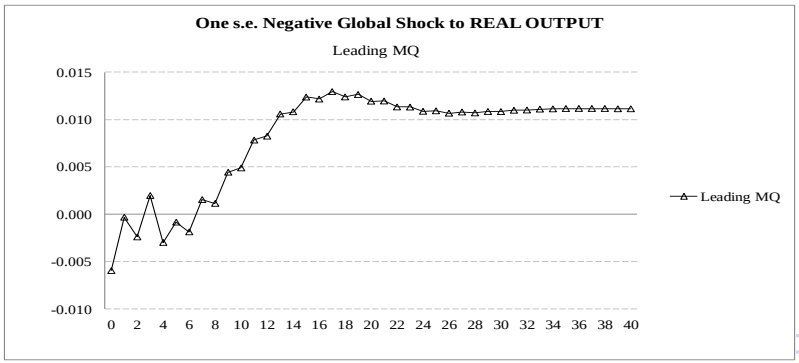
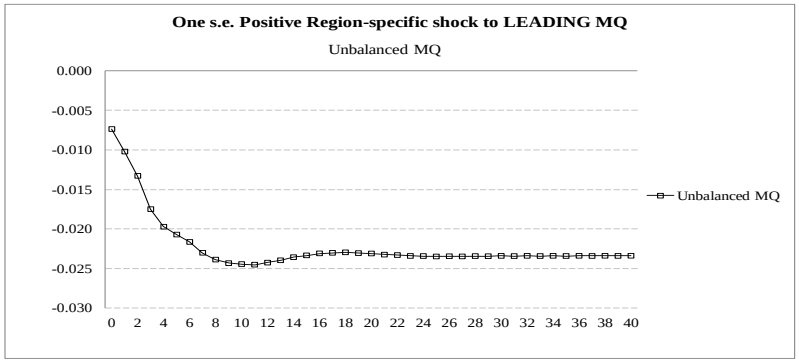
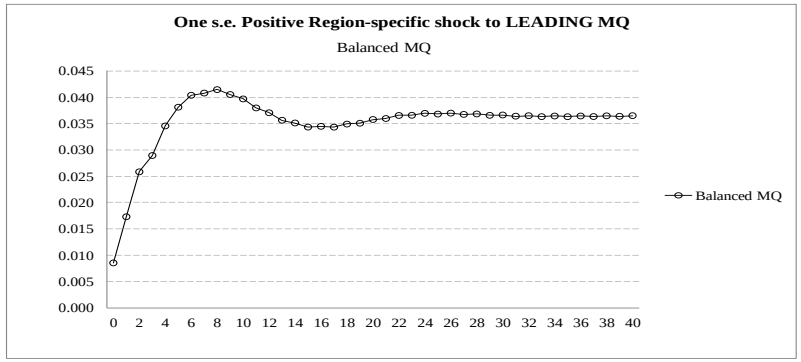
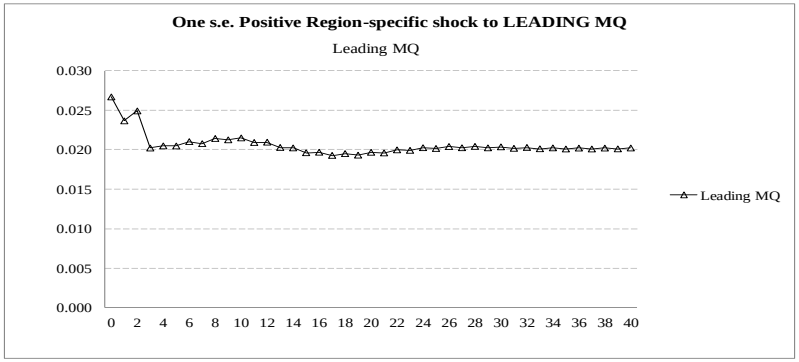


Figure : GIRF of a shock to Leading MQ

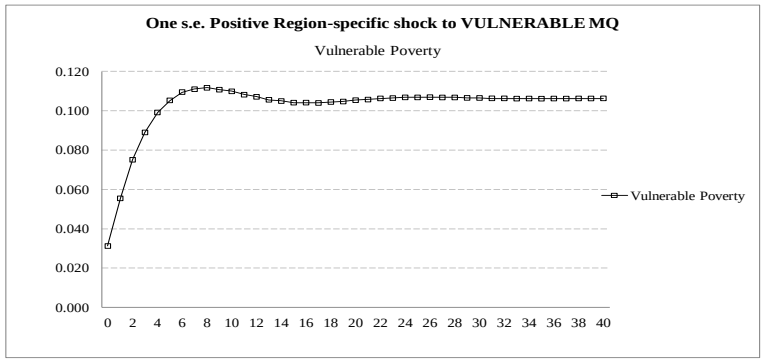


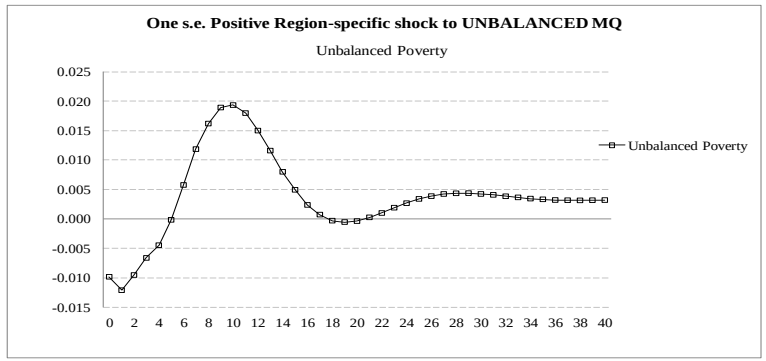


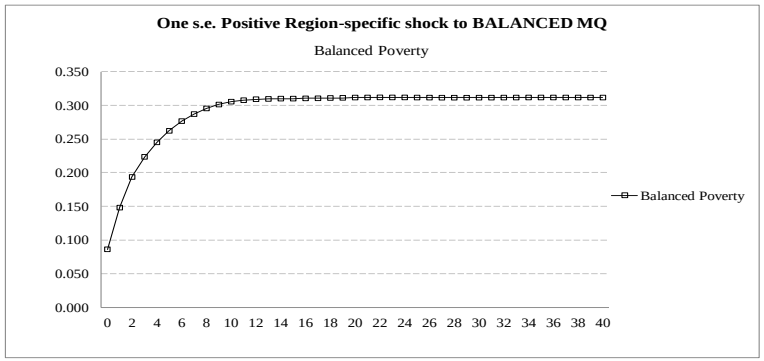


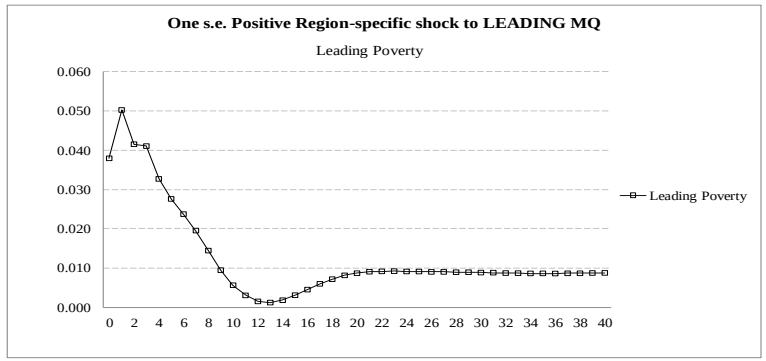
The marriage of poverty and inequality: An intractable problem?

Shock to Modified Inequality Index









- The vision of a multi-dimensional link matrix that emerges is therefore multifaceted and complex. However, it is able to supplement, adding as yet little explored nuances and meanings to possible inter linkages among European countries.
- Clear evidence of significant pass through of income inequalities.
- The outcome of such experiment not only provides further evidence for the validity of the extraordinary dynamics among inequalities and poverty, but also shows the magnitude of the poverty responses to such inequality developments in advanced and highly vulnerable member states.

Thank you.