

Macroeconomic resilience

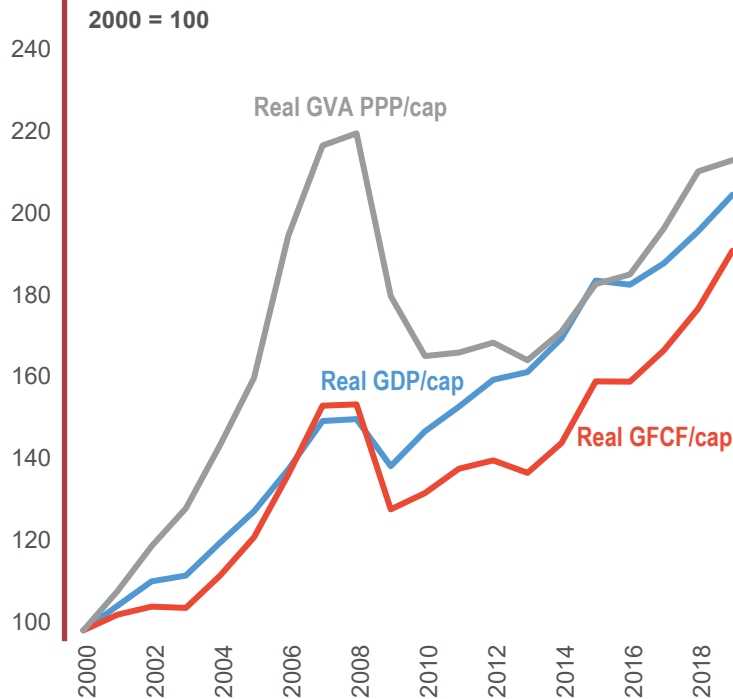
The macroeconomic subsystem is an important component of the economic system. It reflects the performance of different macroeconomic aggregates, such as investment, consumption, and aspects related to trade openness or the budget balance. Particular attention is also given to the construction sector, which was one of the most affected sectors following the 2008–09 economic crisis. When it comes to the dynamics of these aggregates in the wake of shocks, a drop in production is commonly expected, as higher unemployment and lower incomes lead to reduced consumption, lower savings and reduced investments. Given the contraction of economic activity, the revenues are also decreasing, which may raise the budget deficit and debt.

Different measures are used for delimiting the two intervals (corresponding to resistance and recovery), such as the indicators at the EU level (if available) or the country/regional level average. Three landmarks are identified for each indicator: peak year, trough/bottom year and the year of full recovery/the most recent available. Resistance starts in the peak year before the shock and ends when the minimum is reached (trough year). Recovery starts in the trough year and ends when the indicator completely recovers to the pre-shock value or the most recent year available (if full recovery was not yet reached). The slopes for each of the indicators were computed over the periods delimited and aggregated into a common resilience performance index. The aggregation of components and the weights applied relies on the methodology suggested by the OECD (Nardo et al., 2008).

Subsystem	Indicator description
Budget balance	Net lending: total general government revenue minus total general government expenditure, excluding gross fixed capital formation (share to GDP) General government consolidated gross debt (Percentage of GDP at current prices: Excessive deficit procedure (based on ESA 2010) and former definitions (linked series). The indicator was rescaled after normalization.
Consumption	Final consumption expenditure of households per capita (2015 prices, PPP) Final consumption expenditure of households, by consumption purpose: hotels and restaurants & recreation
Investments	Real GFCF per capita (2015 prices, PPP) Share of FDI inflows to GDP
Production	Real GDP per capita (2015 prices, PPP)
Production (Constructions)	Real GVA construction PPP per capita (2015 prices, PPP) House price index: annual average index
Savings	Adjusted net savings per capita (current US\$)
Trade	Share of exports to GDP

Note: Both NUTS0 and NUTS2 indices include all the indicators. For the NUTS2 level index, the country level values were used for every region.

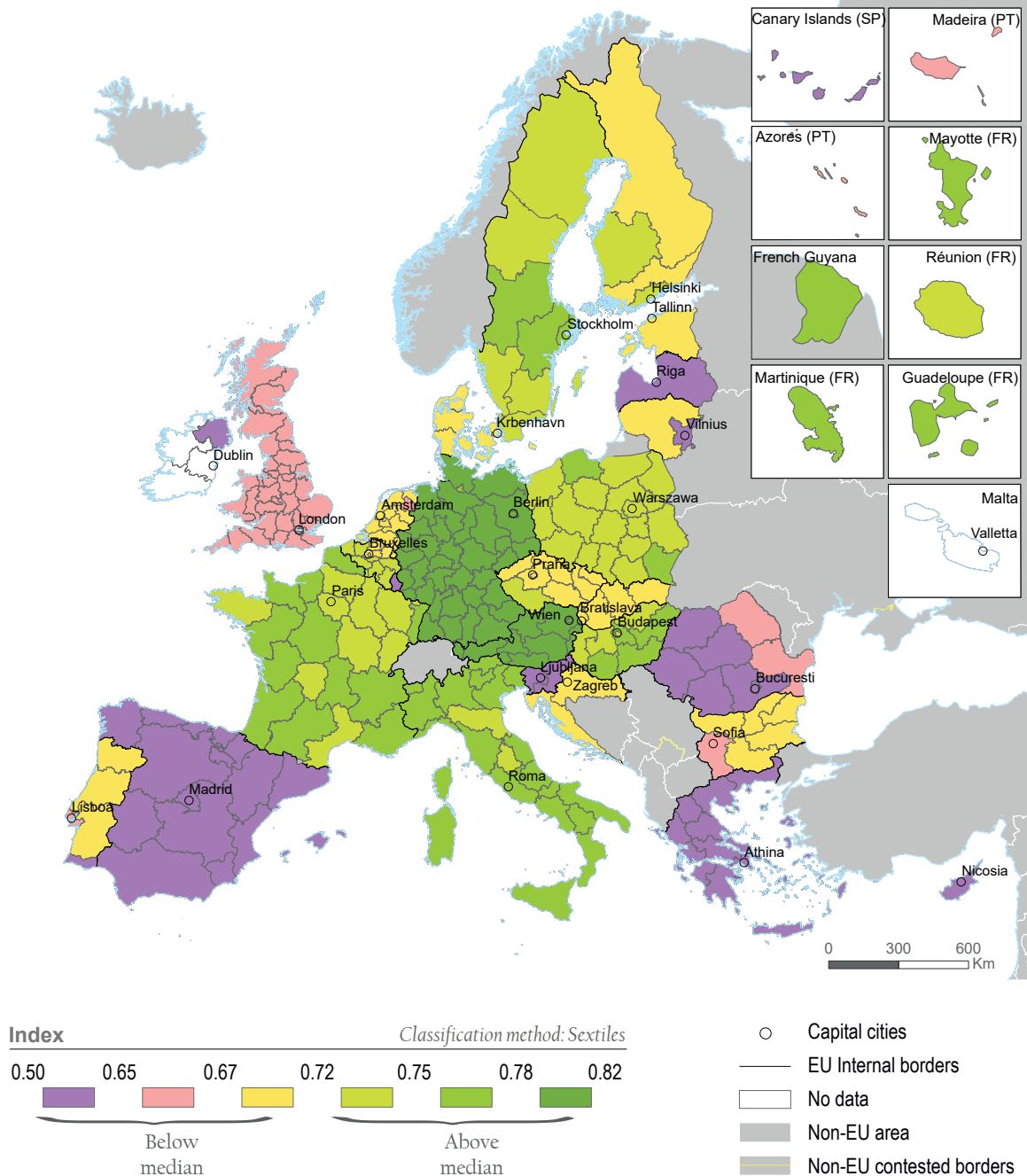
Main dimensions composing macroeconomic resilience



The figure clearly reflects that the Great Recession had generated a major shock that affected some of the most representative macroeconomic aggregates at the EU level. While the production level contracted with 8%, investments decreased by 17% (in 2009, compared to 2008). The construction sector, which was one of the triggers of the recession, has also plunged dramatically, by almost a quarter, over a two-year period (2008–2010). The pace of recovery was quite different. If the production level displayed a quick recovery (2011), the level of investments took 6 years to recover (2015). Unlike the two aggregates, the construction sector has not fully recovered yet, but it is close to its pre-crisis level (2018).

Territorial level	Source	Resistance interval	Recovery interval
NUTS0	AMECO	2007–2010	2010–2018
NUTS0	AMECO	2007–2014	2014–2018
NUTS0	Eurostat	2008–2009	2009–2011
NUTS0	Eurostat	2006–2011	2011–2016
NUTS2	ARDECO	2008–2009	2009–2015
NUTS0	UNCTAD	2007–2008	2008–2018
NUTS2	ARDECO	2008–2009	2009–2011
NUTS2	ARDECO	2008–2013	2013–2017
NUTS0	Eurostat	2008–2013	2013–2018
NUTS0	World Bank	2007–2009	2009–2018
NUTS0	Eurostat	2009–2010	2010–2011

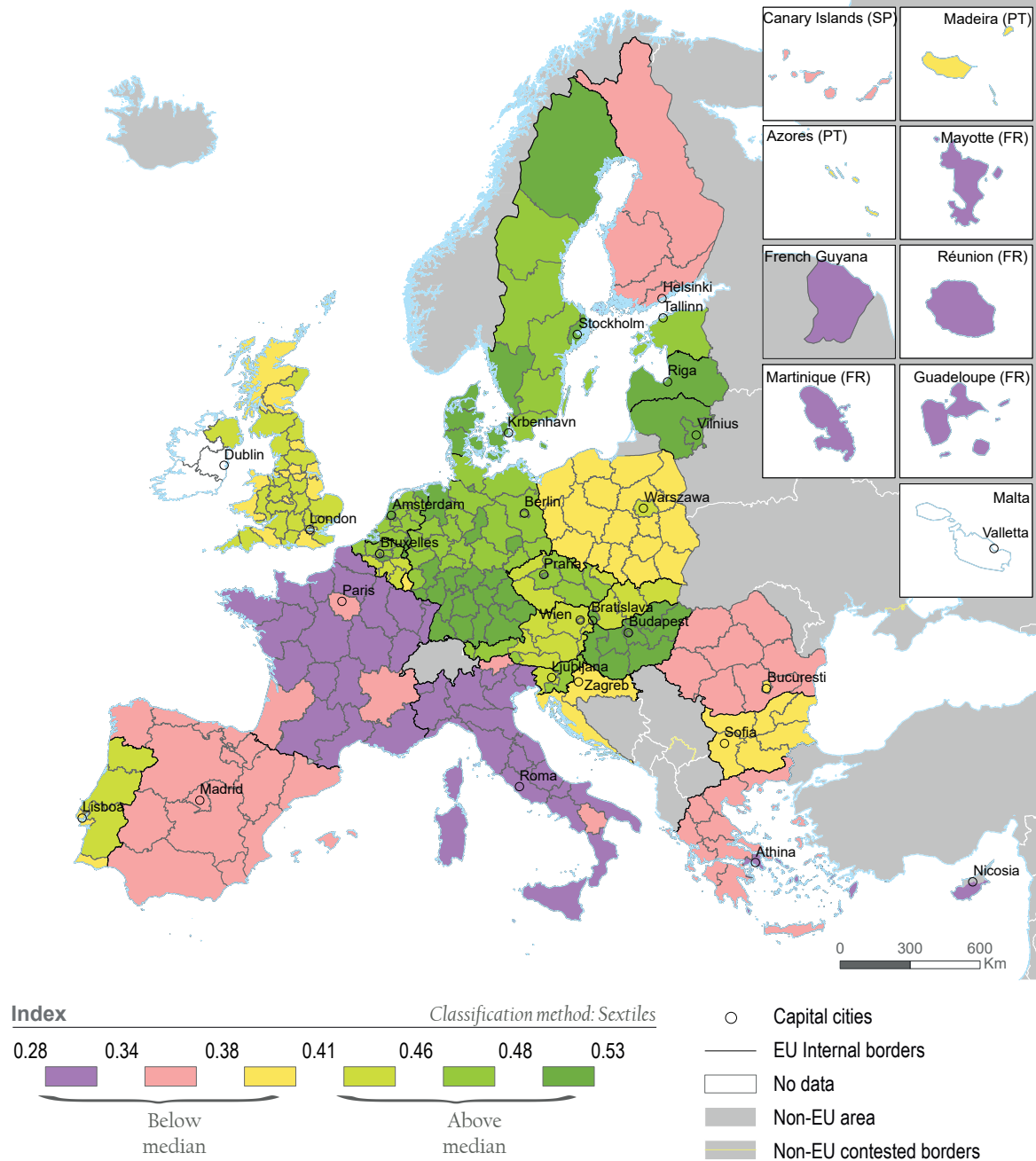
Macroeconomic resistance



Lower resistance in the peripheral regions of EU

The differences in resistance are mainly influenced by the variation of the highest loaded factors: constructions, exports, investments and loisir expenditure. The regions from Germany and some regions from Austria, France, Italy, and Sweden resisted better to the economic crisis. They recorded high values in construction, loisir expenditure, house prices and savings. The regions from Greece, Slovenia, Latvia, Spain and western part of Romania displayed the lowest resistance. The intranational differences between regions are rather modest, the regional resistance being mostly the result of national policies.

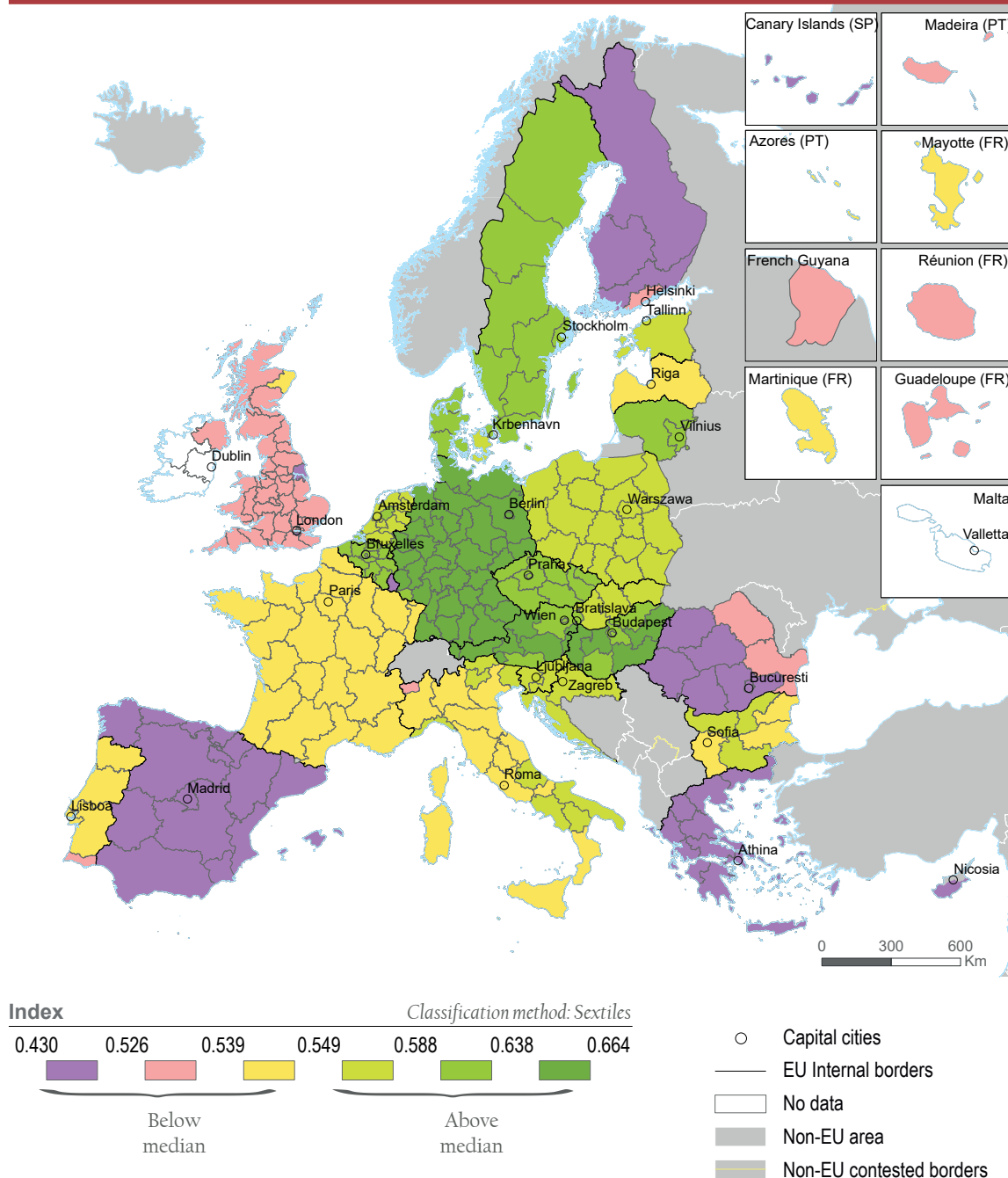
Macroeconomic recovery



Sometimes, the recovery is more difficult to achieve than the resistance

The highest values for the recovery are recorded in the central and northern parts of the EU (Hungary, Germany, Sweden, Denmark, or the Baltic countries), while the regions from France, Southern Europe and Finland displayed the slowest recovery. French, Italian and Polish regions, have also been some of the most resistant to the shock. Overall, the recovery was mainly triggered by income, consumption, investments and exports, while the high ratio of government debt, low level of consumption, or the house prices outbalanced the recovery. The intranational differences are rather small, as in the previous map.

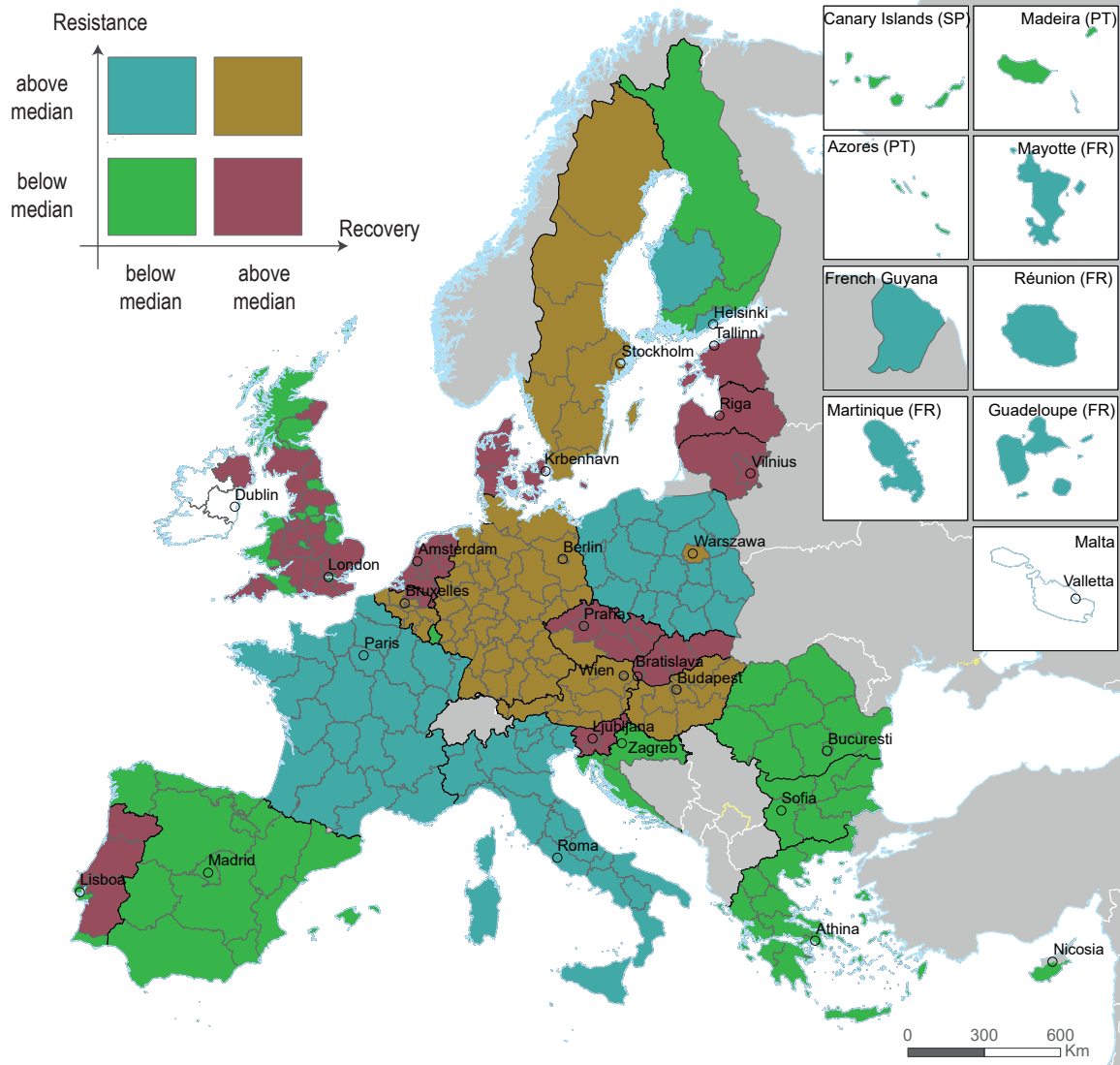
Macroeconomic resilience performance



Higher performance in the central regions of the EU

Macroeconomic performance sub-index is computed as the average between resistance and recovery indexes. From the macroeconomic perspective, the most resistant regions have also been the most performant (regions from Germany, Poland and Sweden). Meanwhile, the less resistant regions from Greece, Romania, Spain, or Finland are also the less performant. The regions from the same country tend to display the same overall performance, some small differences being observed in Romania, Bulgaria, Italy, or Hungary.

Typology of resilience



Macroeconomic resilience performance – regional clusters

Looking at the macroeconomic evolution of EU regions during the Great Recession reveals that, overall, Germany and Austria displayed the best performances when considering simultaneously both resistance and recovery trajectories. This performance was mainly driven by their solid resistance to the crisis. At the other end lie Cyprus, Spain, and Greece which reported performances below the mean in terms of both resistance and recovery. There are also states showing a mixed performance over the two distinct changes. On the one hand, Italy and France displayed a good resistance to the shock, their recovery being quite slow. On the other hand, the Baltic states, Denmark and Sweden followed a fast recovery, despite their initial poor resistance to the shock.

Interestingly, Burgenland, Salzburg and Tirol (Austria) were the most resistant to the 2008–09 economic crisis while Sostines regionas (Lithuania), Nyugat-Dunántúl (Hungary) and Stuttgart (Germany) displayed the best recovery performance. However, dispersion of inter-state values is not very high either, which can be proof of the interconnectivity of European economies.