esm blog

European Stability Mechanism

The innovation channel of fiscal consolidation

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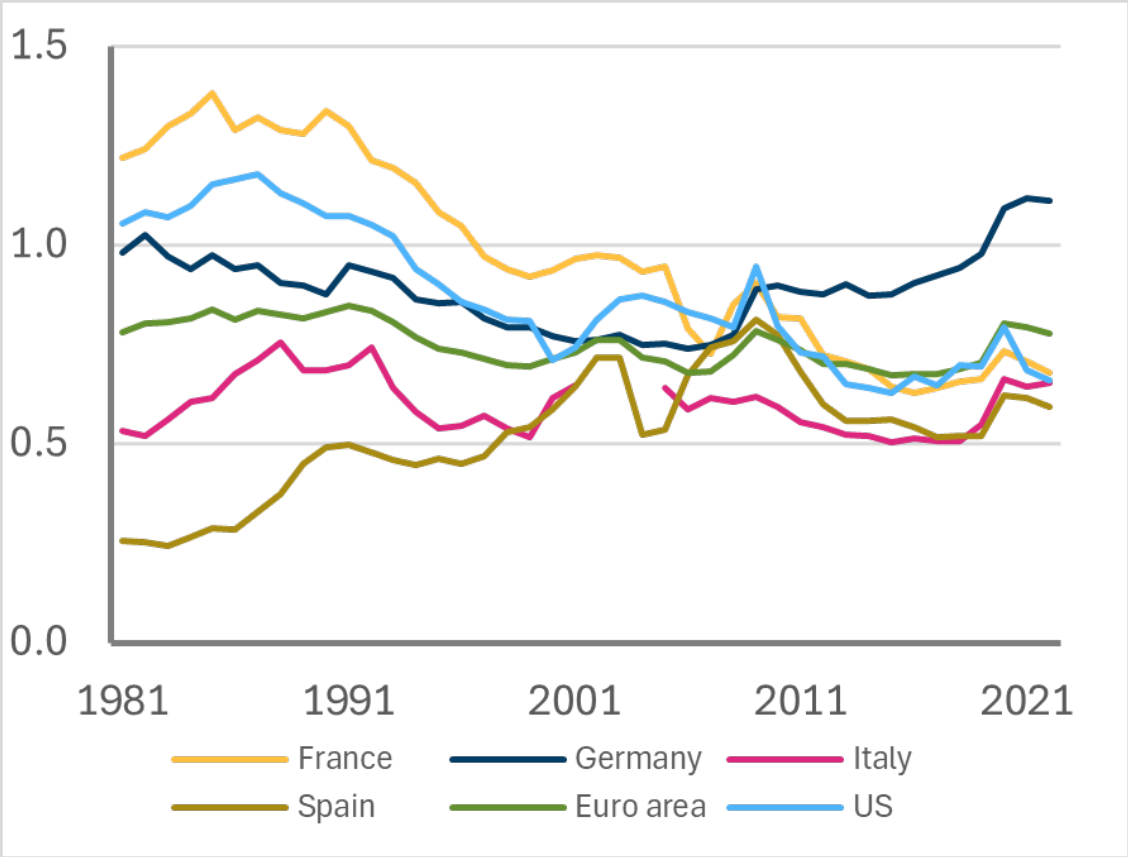
Preserving research and development spending during a consolidation will avoid technological divergence in the euro area, and hence fragmentation. Investing in innovation is crucial for sustained and sustainable long-term growth and competitiveness, particularly amidst issues brought on by megatrends such as climate change, the push for digital transformation, and population ageing. [1] The Covid-19 pandemic and the energy crisis have resulted in higher debt-to-GDP ratios and debt service costs, reducing governments' fiscal room for manoeuvre. Countries with lower R&D spending cut it more than their peers during consolidations, and the private sector did not step up to fill the gap. Revenue-based consolidations raising the tax burden for the private sector undermined R&D investment across the board. As EU Member States are drawing up their medium-term fiscal-structural plans, they should be attentive to maintaining R&D spending, as failing to do so might fuel an R&D doom-loop for less innovative countries, thus exacerbating divergence and fragmentation.

When preparing their medium-term fiscal adjustment plans to implement the new set of EU fiscal rules, EU Member States are facing a trade-off between the need to consolidate and the need to improve competitiveness and deploy innovation-enhancing fiscal policies. Over the past decades, public R&D spending evolved largely in line with economic activity among euro area member states, but displayed a high degree of volatility and was pro-cyclically cut during fiscal consolidation periods, both in absolute terms and in relation to total primary spending. Private spending, however, outpaced economic activity, though with large heterogeneities across euro area member states (see Figure 1a, b). Deeper integration in the euro area should have made capital more readily available to firms, but European business investments in R&D did not reach the levels of the United States (US), and China became a major competitor in the global arena.

Figure 1: The dynamics of research and development investments are heterogeneous across countries, both in terms of levels and growth rates

a: Government budget allocations for R&D

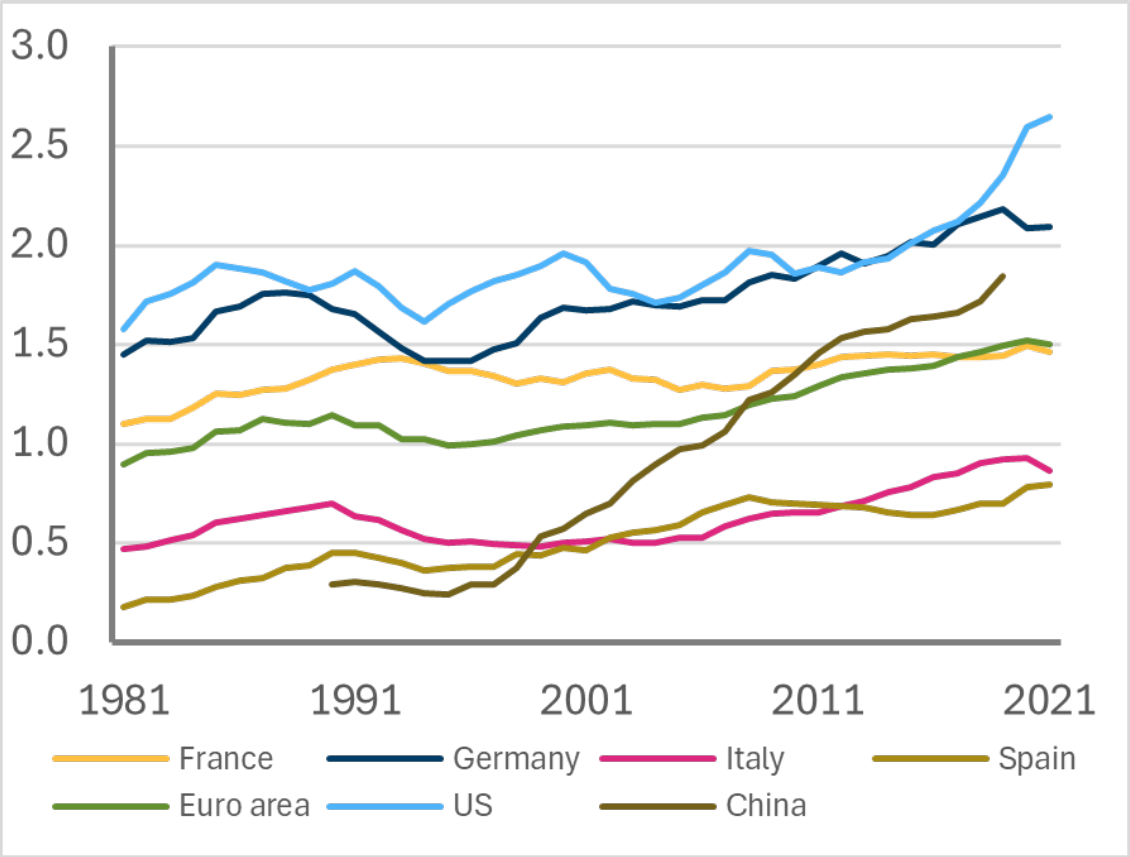
(% of GDP)



Note: Break in timeseries for Italy due to missing data between 2002-2004.

b: Business enterprise R&D expenditure

(% of GDP)



Source: Organisation for Economic Co-operation and Development Main Science and Technology Indicators

Understanding the impact of fiscal consolidation on research and development is a crucial topic for the ESM because the choices affect market access, long-term growth, and fiscal sustainability – all linked to our role in crisis prevention and financial stability oversight. Hence, we examine how fiscal consolidation plans have caused more fragmentation in the euro area due to uneven cuts in public R&D spending and the varying capacities of private investments to offset reductions in public spending. We also suggest policy options to address this issue.

The innovation doom-loop: low R&D intensity and fiscal consolidation

During fiscal consolidation, countries with moderate R&D intensities have cut public R&D expenditure proportionally more than those leading in innovation.

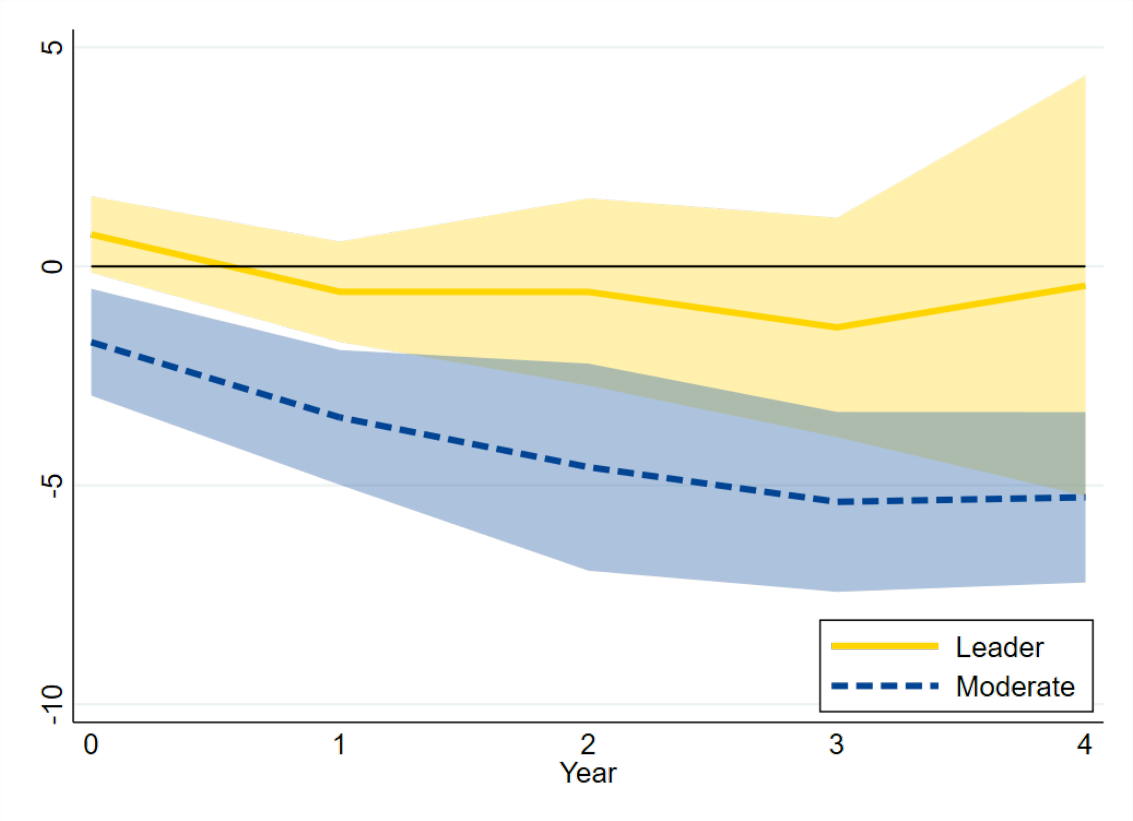
Fiscal consolidation led governments to prioritise immediate fiscal needs over long-term investment in innovation, particularly in countries with moderate innovation capacities.[2] These countries, which were already lagging in R&D spending and innovation, thus entered a doom-loop, where a deeper innovation gap and further reduction of their competitive edge perpetuated low and decreasing R&D expenditure and innovation (see Figure 2a, b).

The private sector response exacerbated fiscal consolidation effects for less innovative countries. For highly innovative countries, the private sector appeared to be able to step in and reallocate resources efficiently, thus overall compensating for the lower level of public R&D investment. Less innovative countries displayed an opposite response, with private R&D investment decreasing following a consolidation episode, thereby contributing to a reduction in total domestic R&D expenditure.

Figure 2: Impulse response to a consolidation shock (1% of GDP). The responses of R&D investment to fiscal consolidation differ between the two states of innovation

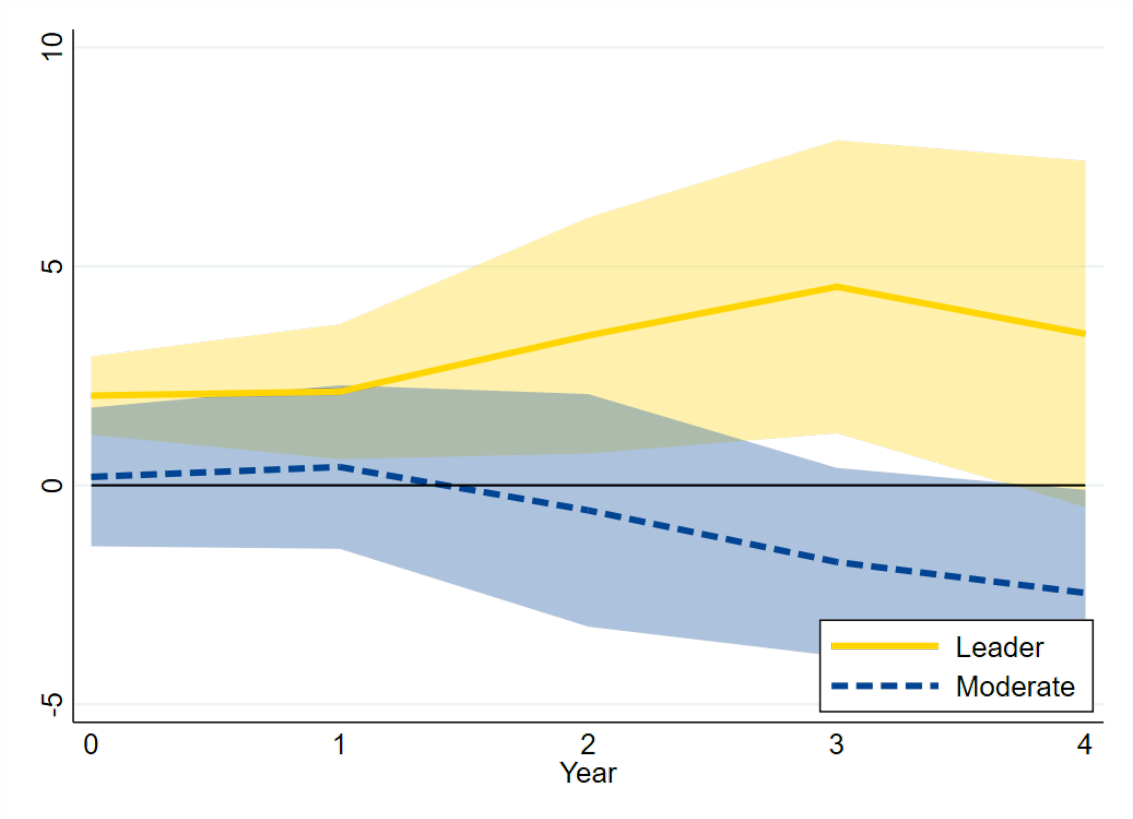
a: Government budget allocations for R&D

(Cumulative percentage change)



b: Business enterprise R&D expenditure

(Cumulative percentage change)



Note: The classification of innovative leaders (highly innovative) and moderate innovators (less innovative) is based on the World Intellectual Property Organization Global Innovation Index. Leaders group (top half of the sample, ranking higher in the GII): Denmark, Germany, Finland, Sweden, Japan, United States, France, and Canada. Moderate group (bottom half of the sample): Australia, Austria, Belgium, Ireland, Italy, Portugal, and Spain.

Source: ESM calculations based on local projection analyses

The design of fiscal consolidation matters

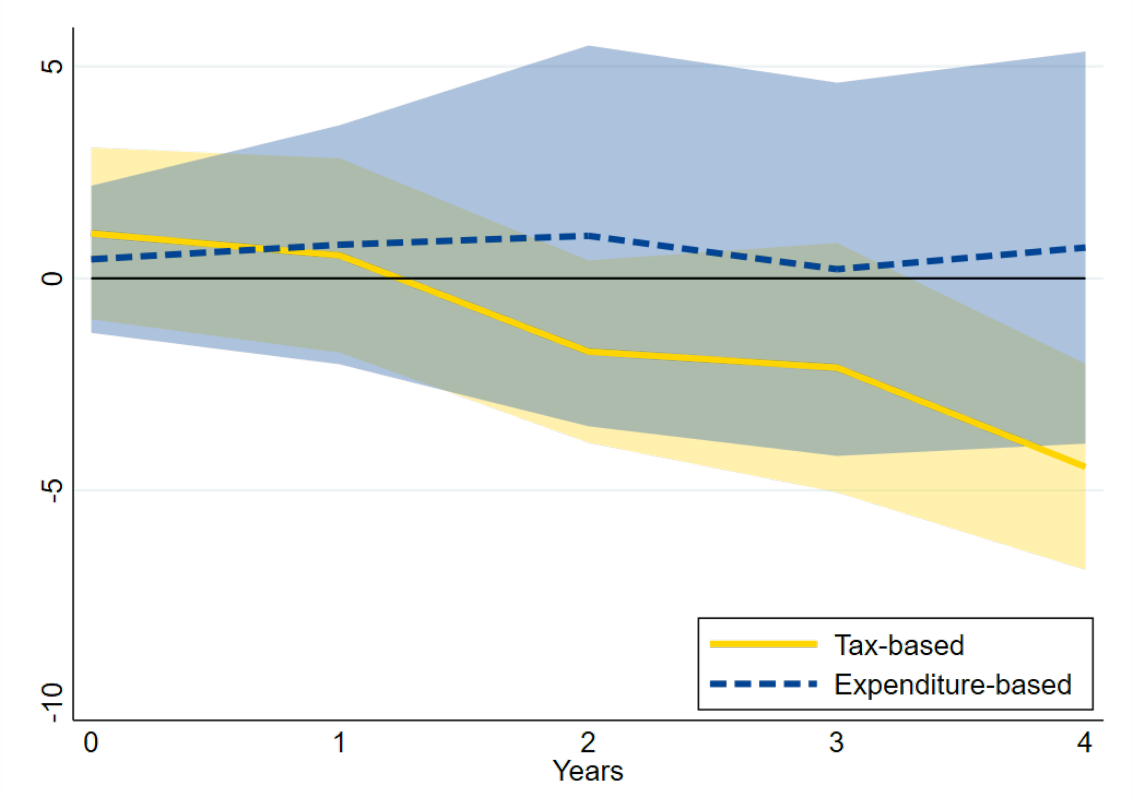
The overall effect of fiscal consolidation on domestic R&D investment depends on the fiscal policy mix adopted. Expenditure-based consolidation does not seem to reduce domestic research, but rather tends to spur businesses to fill the gap left by the public sector in countries with high innovation potential. There the private sector response helps maintain overall R&D levels, thus supporting ongoing innovation activities. Contrastingly, tax-based consolidation, which raises taxes to balance budgets, directly reduces the resources available for businesses to invest in R&D. The higher tax burden dampens private investment, leading to a decline in overall R&D activities for all countries, those with moderate and high innovation potential (see Figure 3a, b).

Our analysis stresses the importance of the innovation channel of fiscal consolidation, which refers to the impact of fiscal policies on innovation activities. It also aligns with the literature arguing in favour of expenditure-based consolidation. Tax-based consolidation plans have been found to be associated with reduced growth in investment and decreased business confidence. [3] By focusing specifically on R&D spending, our results add another perspective to that literature, highlighting potential medium- to long-term consequences associated with the type of consolidation plan implemented. Expenditure-based consolidation tends to incentivise private innovation investment, thereby compensating for the cut in public innovation investment. Conversely, tax-based consolidation tends to weigh on both public and private innovation investment.

Figure 3: Impulse response to a consolidation shock (1% of GDP). The effects of consolidation plans depend on their design

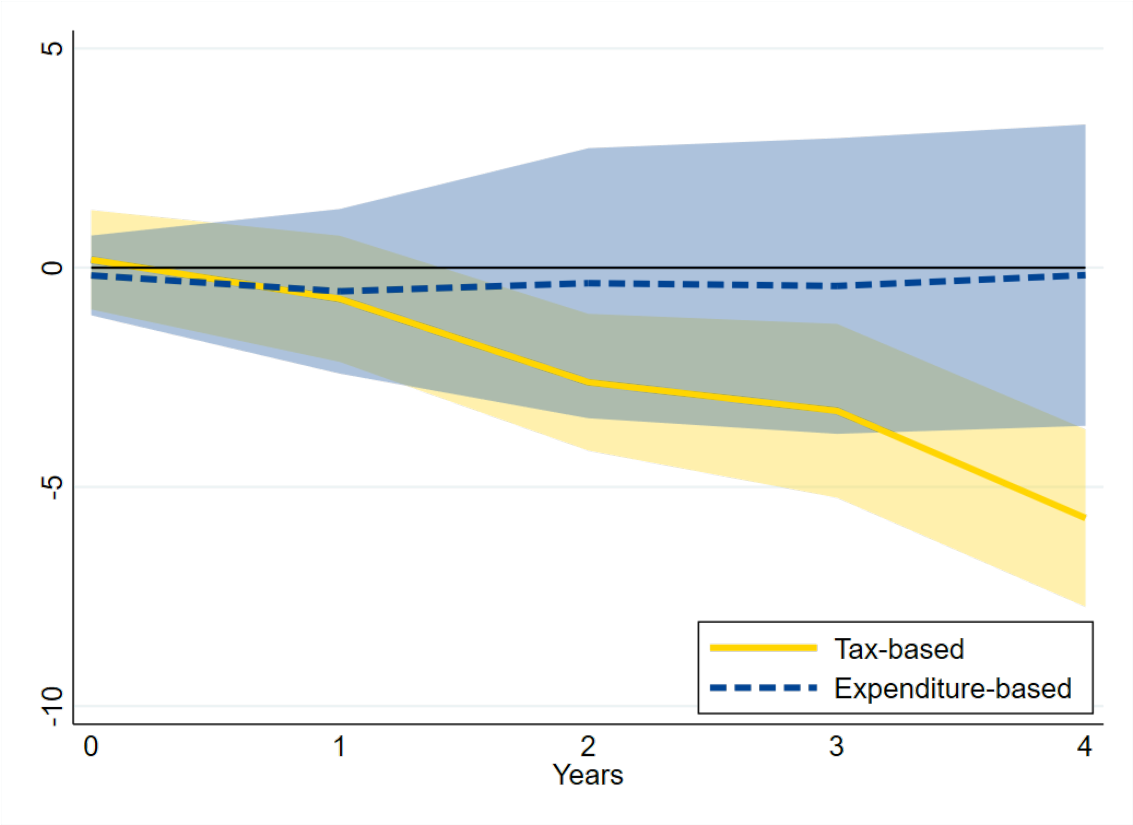
a: Business enterprise R&D expenditure

(Cumulative percentage change)



b: Gross domestic expenditure on R&D

(Cumulative percentage change)



Note: The classification of tax- and expenditure-based consolidations is based on the work of Alesina et al. (2015).

Source: ESM calculations based on local projection analyses

To conclude: R&D investment has been highly sensitive to fiscal consolidation, and failing to acknowledge how fiscal consolidation affects this crucial part of investment can fuel an innovation doom-loop. As this is particularly acute in less innovative countries, the innovation doom-loop can lead to divergence and fragmentation across the euro area. The medium-term focus of the new EU economic governance framework is conducive to breaking this vicious cycle. Consolidation strategies should prioritise expenditure-based adjustments, targeting spending types that are normally more rigid. This approach would preserve government investment and R&D spending and foster private sector investment to complement public R&D funding.

In the last months, the Eurogroup exchanged views on the nature of policies designed to boost competitiveness, both in the short and long term. At the same time, the European Commission has recently featured research and innovation as a high priority as part of the 2024–2029 political guidelines. Acknowledging and factoring in the interlinkages between R&D investment and fiscal policy design will be important in preserving long-term growth and fiscal sustainability, two core focus areas for the ESM.

Acknowledgements

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Footnotes

[1] Rolf Strauch (2024), "Three megatrends will determine future growth in Europe", Op-ed in Handelsblatt, 22 January 2024: Three megatrends will determine future growth in Europe | European Stability Mechanism (europa.eu) .

[2] Innovation-status is defined based on the 2023 Global Innovation Index (GII) ranking. Countries in the sample are divided into two groups based on their scores (following Public R&D Investment in Economic Crises by Maikel Pellens, Bettina Peters, Martin Hud, Christian Rammer, Georg Licht :: SSRN): innovative leaders are the top half of the sample, ranking higher in the GII; moderate innovators are the bottom half of the sample.

[3] Alesina, Favero, and Giavazzi 2014. The output effect of fiscal consolidation plans - ScienceDirect.