

Intereconomics

Review of European Economic Policy

Important subscription information
on the enclosed postcard



FORUM

The Future of European Industrial Policy

Sebastian Dullien, Reinhilde Veugelers, Fabrice Naumann, Monika Schnitzer,
André Wolf

Editorial

A Challenging Juncture for von der Leyen II
Karel Lannoo

Fiscal Policy

Debt Sustainability Analysis in Reformed
EU Fiscal Rules
*Philipp Heimberger, Lennard Welslau,
Bernhard Schütz, Sebastian Gechert,
Dario Guarascio, Francesco Zezza*

Regional Policy

Quo Vadis, Cohesion Policy? European
Regional Development at a Crossroads
Thomas Schwab

Housing Markets

Credit and House Prices in the Irish
Residential Market
Paul Egan, Kieran McQuinn, Conor O'Toole

Monetary Policy

Green ECB Credit: One Step Too Far
Christian Pfister

Letter from America

How the US Dollar's Dominance
Negates Fears About Debt and Deficits
Mark Copelovitch

Intereconomics

Review of European Economic Policy

Editorial

- Karel Lannoo A Challenging Juncture for von der Leyen II..... 246

Forum

The Future of European Industrial Policy

- Introduction..... 248
- Sebastian Dullien European Industrial Policy in the 2020s: Rationale, Challenges and Limitations249
- Reinhilde Veugelers An Innovation-Based Industrial Policy for the EU..... 254
- Fabrice Naumann, Rationales for Industrial Policy in the Semiconductor Industry 262
- Monika Schnitzer
- André Wolf Framework Conditions for Net-Zero Industry Clusters in Europe 267

Articles

Fiscal Policy

- Philipp Heimberger et al. Debt Sustainability Analysis in Reformed EU Fiscal Rules276

Regional Policy

- Thomas Schwab Quo Vadis, Cohesion Policy? European Regional Development at a Crossroads284

Housing Markets

- Paul Egan, Kieran McQuinn, Credit and House Prices in the Irish Residential Market..... 293
- Conor O'Toole

Monetary Policy

- Christian Pfister Green ECB Credit: One Step Too Far 301

Letter from America

- Mark Copelovitch How the US Dollar's Dominance Negates Fears About Debt and Deficits..... 307

Abstracted/Indexed in: Scopus, EconLit, Google Scholar, EBSCO, CSA, ProQuest, ABI/INFORM Collection (ProQuest), Baidu Scholar, Business Source Elite, Business Source Premier, CEEAS (Central & Eastern European Academic Source), CNKI Scholar (China National Knowledge Infrastructure), Dimensions, ECONIS, ESO (European Sources Online), ExLibris, IBZ (International Bibliography of Periodical Literature in the Humanities and Social Sciences), International Bibliography of the Social Sciences (IBSS), J-Gate, KESLI-NDSL (Korean National Discovery for Science Leaders), MIAR, MyScienceWork, Naver Academic, Naviga (Softweco), PAIS Index, ProQuest, Public Affairs Index, ReadCube, Research Papers in Economics (RePEc), ScienceON/AccessON, Scilit, Scite_, Semantic Scholar, Sherpa/RoMEO, TDOne (TDNet), WAO (World Affairs Online), WorldCat (OCLC), X-MOL

A Challenging Juncture for von der Leyen II

To tackle Europe's economic decline, prepare and actively adapt for a new wave of enlargement, and defend Europe's geopolitical position, as a rule maker, the European Commission will need to deliver. Looking back at the past five years provides reassurance that preparedness is in place: beyond the planned programmes, the European Commission effectively responded to multiple crises. But the path forward will be steep.

The economic challenges are undoubtedly enormous. The Draghi report has laid them out very well. Europe's wealth creation is in question: Europe does not invest or innovate sufficiently, it does not spend enough on R&D, and it lacks qualified labour. It needs to prepare for a rapidly ageing population and invest more in defence. The productivity gap between Europe and the US is between 12% and 30%, depending on the measure. And as the Letta Report also laid out well, the EU is not enough of a single market, it is too fragmented in financial and digital services, and energy is too expensive.

There have been many challenging junctures for the EU, and the EU Commission, over the past decades. Ten years ago, Jean-Claude Juncker spoke about the "Commission of the last chance". Competitiveness was already a core concern over 20 years ago, as evidenced by the Lisbon declaration of the December 2000 European Council and the troubles in Germany in 2001-03, when the country was the "sick man" of Europe, leading Chancellor Schröder to enact the Hartz reforms.

Over the past five years, the EU has demonstrated that it can respond to unexpected events. In addition to addressing the green and digital transition, the EU Commission reacted to the COVID-19 pandemic, to the energy crisis and to Russia's illegal invasion in Ukraine. The EU adopted the Support to mitigate Unemployment Risks in an Emergency programme and Recovery and Resilience Facility to prevent an economic downturn. It adopted 14 packages of sanctions against Russia by unanimity among the foreign ministers. In June 2022, the European Council agreed to accept candidate status for Ukraine and Moldova, and opened accession negotiations in June 2024.

What is problematic now is the shrinking of the centre and the rise of the extreme right in the European Parliament, and in many member states, which will make any programme to tackle Europe's decline or agreements on further enlargement difficult. Compared to 15 years ago, the centrists parties' (EPP, S&D, Renew, Greens) share in the European Parliament has declined from about 85% to 65% of the seats. Whether they are bribed by Russia, or other forces, far-right parties have a common interest in adopting populist policies to win over voters, be it with anti-immigration or purely racist slogans, protectionist policies, or irresponsible fiscal measures. Such policies will certainly not improve Europe's competitiveness. But what is competitiveness and how to explain it?

For many, competitiveness is shorthand for reducing regulatory overkill, or it is inversely related to regulation – i.e. the more rules, the lower the profits. The EU is seen as the cause of this excessive regulation; some find it an unaccountable bureaucratic monster, the source of unbridled rulemaking for the digital and green transition outpacing corporations. The origin of this misunderstanding is the assimilation of the competitiveness of companies into that of countries, where it is entirely different. For a company, it is the bottom line, its market share and growth. Countries, on the other hand, can be competitive in various ways. The metric is the wellbeing of the population, for which

© The Author(s) 2024. Open Access: This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>).

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

different measurements exist that do not have a consensus. Paul Krugman's 1994 Foreign Affairs article *Competitiveness: A Dangerous Obsession* remains topical. He argued that "competitiveness is a meaningless word when applied to national economies. And the obsession with competitiveness is both wrong and dangerous." Although these observations were made 30 years ago mainly with respect to competitiveness between the EU, the United States and Japan, if we replace "Japan" with "China", it is applicable to the current global geoeconomics.

At the country level, the most often-used indicator is gross national product (GNP), but even here, there are assorted ways to measure it (e.g. GNP in absolute numbers, or per person, working population only, per hour worked and at purchasing power parity – each produces very different results). International comparisons have the problem of adjusting for exchange rate differences. A country can be competitive while having an enormous trade deficit (e.g. the US) or being highly indebted (e.g. Japan). But the distribution of wealth and its evolution are also notable, where important differences remain in the EU and at the member state level (see the ECB's household wealth data¹ and Gini coefficient). A median increase in household wealth could be more consequential than absolute GNP growth.

Hence, the use of competitiveness as a mantra for the von der Leyen II Commission is fraught with difficulties. It is probably no coincidence that the Draghi report, while being all about the future of European competitiveness, does not define it. This is a serious challenge for the new Commission to use it as its leitmotif. According to Jacques Pelkmans, "without a definition it becomes hard and somewhat arbitrary to identify how his proposed strategy, if implemented, could be deemed as either a success or a failure. There is also no clear priority setting anywhere".²

Moving to the geopolitical ambitions of the EU, this will be equally difficult. Five years ago already, President von der Leyen wanted a geopolitical Commission, which was well chosen in hindsight, but remains difficult, given the limited or subordinate competencies of the EU in foreign and security policy. The proposed appointment of a Commissioner for Defence and Space (Andrius Kubilius) in a mandate shared with two other Commissioners and the Commission President led to NATO Secretary General Stoltenberg's warning against duplication and competition.³

There is no single market in the EU for the procurement of defence material; instead, this sector is very fragmented and uncompetitive. The EU would firstly need a treaty change to make a defence single market possible, which would be very difficult politically. The EU has tried to circumvent this with the European defence industry reinforcement through common procurement and Support of Ammunition Production programmes, but the budget of these is not even 1% of the national defence budgets of its member states, which amounted to €214 billion in 2022.⁴ The EU will thus need to watch its credibility when moving in the security domain, and manage to keep pace with NATO, which has enlarged substantially recently with Finland and Sweden.

Our proposal for the von der Leyen II Commission is to focus on delivering. After the enormous legislative efforts of the past five years, the EU Commission should make sure that all of these rules are well implemented and enforced. Enforcement remains a weak point for the EU, with the Single Market Scoreboard showing an increasing number of infringements. Delivering on the Single Market, as Enrico Letta repeatedly indicated, should be the best way forward to growth. Delivering on enlargement, and thus extending the Single Market, should build on previous success stories and contribute to the geopolitical stability of the European continent. Communicating this well to the European population remains a challenge, but given the achievements by President von der Leyen in her first term, this should be attainable in the second term.

Karel Lannoo, Centre for European Policy Studies, Brussels, Belgium.

1 <https://www.ecb.europa.eu/press/pr/date/2024/html/ecb.pr240108--ae6f7ef287.en.html>

2 <https://www.ceps.eu/ceps-publications/a-critical-first-response-to-mario-draghis-competitiveness-report/>

3 <https://www.ft.com/content/2f12a312-6ac3-4f84-aae5-de6b247638fe>

4 <https://legrandcontinent.eu/fr/2023/09/25/pour-un-marche-unique-de-la-defense-europeenne/>

The Future of European Industrial Policy

In the current landscape of significant technological, economic and geopolitical shifts, Europe needs a forward-looking industrial policy to boost innovation, productivity, quality job creation, sustainability and growth. However, simultaneous crises, including the COVID-19 pandemic and the Russian war of aggression against Ukraine, have resulted in supply chain strains, rising energy prices and general uncertainty. Still, challenges can create opportunities for companies and citizens – if they are addressed properly. This Forum considers the priorities for the future of European industrial policy that are critical for the EU's economic security.

European Industrial Policy in the 2020s: Rationale, Challenges and Limitations

Sebastian Dullien, Macroeconomic Policy Institute (IMK), Düsseldorf; and HTW Berlin – University of Applied Sciences, Germany.

An Innovation-Based Industrial Policy for the EU

Reinhilde Veugelers, University of Leuven, Belgium; and Bruegel, Brussels, Belgium.

Rationales for Industrial Policy in the Semiconductor Industry

Fabrice Naumann, Ludwig-Maximilians-Universität München, Munich, Germany.

Monika Schnitzer, Ludwig-Maximilians-Universität München, Munich, Germany.

Framework Conditions for Net-Zero Industry Clusters in Europe

André Wolf, Centre for European Policy, Berlin, Germany.

Sebastian Dullien

European Industrial Policy in the 2020s: Rationale, Challenges and Limitations

By now, the claim that “industrial policy is back” is well-worn. As late as 2019, industrial policy was labelled by an IMF working paper as the “policy that shall not be named” (Cherif & Hasanov, 2019), and economists regularly tried to steer discussions of industrial policy towards broader and general growth-enhancing policies (Enderlein et al., 2019). Yet by 2024, we have not only ample evidence on the recent empirical spread of industrial policy actions around the globe (Juhász et al., 2022), but can also observe a new resurgence of economic research on the topic.¹

In all large economies around the world, industrial policy initiatives abound. Already in 2015, China launched its “Made in China 2025” strategy, which shifted the country’s long-standing activist industrial policy approach towards achieving technology leadership in important key sectors and replacing technologically advanced imports with domestically produced goods. In the U.S., the Biden administration’s Inflation Reduction Act (IRA) as well as the CHIPS Act introduced a whole portfolio of instruments to promote investment and production in the sectors renewable energy and e-mobility, including batteries and semiconductors. The European Union and its member states have also reacted with initiatives such as the Net-Zero Industry Act, the expansion of subsidies and support for Important Projects of Common European Interest, and generally increased room for manoeuvre for national subsidies promoting single companies or specific sectors.

At the time of writing, the jury is still out on what sort of results these industrial policy initiatives will finally deliver. While a rigorous analysis of the impact of industrial policies faces severe identification problems (Juhász et al., 2024), evidence points to the initial success of the IRA, at least when it comes to promoting photovoltaics and battery installations as well as electric vehicle battery

production in the United States (Bauermann et al., 2024). Moreover, the recent technological and export successes in China have often been attributed to the policies implemented under the “Made in China 2025” strategy.

However, sceptics point out a number of risks and challenges of these industrial policy initiatives. First, current industrial policy initiatives are fiscally expensive. In many cases, there is no proper cost-benefit analysis. Linked to the question of fiscal costs, there is always the danger of regulatory capture. Companies might try to get their respective sectors into industrial policy programmes. Businesses in targeted sectors may attempt to soften conditionalities and prolong industrial policy support indefinitely. Trade policies implemented with industrial policy goals in mind might increase consumer prices and create inefficiencies in the economy. Prioritising industrial policy over the integrity of the world trading system might lead to a deterioration of international institutions and ultimately to less international trade and losses of gains from trade.

This contribution looks into the reasons for the renewed interest in and growing use of industrial policy. It points out some of the challenges, outlines necessary conditions for a successful European policy, and indicates where the existing landscape of industrial policy is lacking against these criteria.

Why industrial policy and why now?

The traditional economic argument about when to employ industrial policy is based around the idea of economic efficiency: when market outcomes in the absence of government interventions were not optimal due to some market failures, government interventions were to be considered. If these government interventions could be expected to be less costly than the anticipated benefits from the correction of market failures, economists would support these interventions (Corden, 1974). Efficiency here was usually seen as Pareto efficiency. Vertical industrial policy in this framework was seen as just one among many government interventions, and often as an instrument that was near the bottom of the list of recommended interventions as the potential costs of industrial policy were perceived to be high and the perceived chances of success in correcting market failures were slim.²

¹ For an up-to-date survey, see Juhász et al. (2024).

© The Author(s) 2024. Open Access: This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>).

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

Sebastian Dullien, Macroeconomic Policy Institute (IMK), Düsseldorf; and HTW Berlin – University of Applied Sciences, Germany.

² For a discussion of this argument and its history, see Weiss (2020). The International Monetary Fund (2024b) still uses this framework.

Industrial policy was recommended for market inefficiencies that were often externalities, especially in the form of R&D, learning-by-doing spillovers or coordination (or agglomeration) failures (Juhász et al., 2024). Hausmann und Rodrik (2003) added to these more traditional externalities the concept of a cost-discovery externality. All of these externalities could in principle be addressed by industrial policies.

Already in the late 2010s, the idea of correcting market failures was supplemented by Mariana Mazzucato's concept of industrial policy creating markets, thereby increasing the scope of economic activity and creating additional economic growth (Cimoli et al., 2015).

After the COVID-19 pandemic and the Russian invasion of Ukraine, but also in the wake of rising geopolitical tensions between the USA and China, different types of externalities began to take centre stage. The COVID-19 pandemic showed that an individual firm's vulnerable supply chains might have negative external effects on other parts of the economy. If firms' foreign supply of protective equipment or antibiotics dries up in a pandemic, for example, the damage might go far beyond the sales lost by that individual firm. Similarly, if firms import key inputs to their production (such as energy) predominantly from single countries that cannot easily be replaced (as in the case of pipeline-delivered natural gas), the whole country might become vulnerable to blackmail and, as a consequence, lose its strategic autonomy (Dullien et al. 2022). In both cases, individual economic decisions cannot be expected to take these negative effects into account, and a purely market-based solution is difficult to imagine. Hence, resilience and strategic autonomy have become important arguments for industrial policy.

A final argument for industrial policy at the national level is securing welfare, incomes and jobs. Gomory und Baumol (2000) have shown that in a world with increasing economies of scale, transportation cost and spillovers, key industries will cluster in a limited number of locations. The countries where production takes place will see higher incomes (from monopoly rents), more research and development, faster technological progress and higher tax revenues. Hence, countries have an interest in attracting these key industries. If now some large countries engage in aggressive industrial policy to attract key industries, other countries will be forced to follow suit in order to prevent the relocation of firms and future losses in national welfare.

Of course, if industrial policy only determines the country in which the investment takes place without creating additional technological progress, from a global perspective, coordinated restraint from industrial policy would be economically superior. However, if non-economic con-

siderations such as trying to become the world's largest economy (in the case of China) or preventing the ascent of another power (the United States' approach to China) are added to the equation, it is clear that such a negotiated restraint would be difficult to reach.

Hence the case for industrial policy intervention has become stronger with the recent shifts in the geopolitical environment, especially the experience of vulnerabilities in international supply chains, the growing importance of non-economic motivations in economic policymaking and the pivot towards more active industrial policies both in China and the USA.

What could possibly go wrong?

While the case for industrial policy is overwhelming given the societal and economic challenges outlined above, unfortunately, getting industrial policy right is not that straightforward. First, while the literature provides references to successful industrial policy cases such as the development of steel production and shipbuilding in Korea (Amsden, 1989), the industrialisation and technological updating in China, or the establishment of the airplane producer Airbus, there are equally numerous examples of failed industrial policy such as Brazil's attempt to establish a national computer industry (Luzio & Greenstein, 1995) or Malaysia's attempts to create a domestic automobile industry (Lee et al., 2021).

In the documented cases of failures, public money was often wasted and prices kept high at the expense of consumers without attaining the desired outcomes, lowering overall welfare. In addition to the fact that some projects always fail, one reason for at least some of the failures is seen in regulatory capture, situations in which the industries concerned managed to convince politicians to extend protection or support despite clear signals that the industries had failed to perform in a satisfactory manner.

In addition to pushing up prices, allocating domestic resources inefficiently and wasting public funds, another danger is that industrial policy leads to trade conflict and hence damages the international trading system. In the wake of trade barriers employed to reach industrial policy goals, trade partners might react with retaliatory measures, further distorting the market outcome (International Monetary Fund, 2024a).

Necessary conditions for a successful industrial policy

While there is no clear set of sufficient conditions for preventing industrial policies from failing and producing neg-

ative effects, the growing literature offers some lessons on necessary conditions for a successful industrial policy.

A first and important condition seems to be that the goals for specific industrial policy interventions need to be clearly defined. This holds especially for mission-oriented industrial policies, like those proposed by Mazzucato (2024), but is also true for all purpose-oriented industrial policies, as without a definition of specific goals, a monitoring of success is not possible. The assumption that some policy is implemented in order to boost economic growth in general or to unspecifically support jobs as well as combining too many goals seems to be detrimental to the cost-efficient success of industrial policy. In addition, and linked to this, industrial policy should be subject to a rigorous cost-benefit analysis (International Monetary Fund, 2024b).

Setting performance-related milestones for supported business and following through with sanctions in cases of missed milestones are linked to specific targets of industrial policy support. However, while milestones are important, the nature of industrial policy sometimes pushes business into uncharted territory, and this means that these milestones need to be flexible. A specific challenge here is to exercise adequate flexibility while not allowing regulatory capture and providing a meaningful performance control. To this end, an approach of “embedded autonomy” (Juhász et al., 2024) seems most promising. This term refers to government institutions setting targets, designing instruments and conducting performance control in close interaction with the business sector and the firms concerned, yet exercising autonomy when it comes to withdrawing support.

While it is obvious that “embedded autonomy” requires certain preconditions in the quality of governance, the examples of successfully exercising this type of autonomy in Juhász et al. (2024) from countries of different levels of development and from different regions hint that it should in principle be possible in the European Union.

Beyond performance criteria set and enforced by the public sector, effective market pressure is another mechanism which can keep firms from growing sluggish and develop so-called x-inefficiencies.³ To this end, industrial policy should ideally be designed in a way that it allows incumbents in targeted markets to effectively challenge existing companies.

³ The term “x-inefficiency” refers to a situation in which a firm does not produce with allocative efficiency. For a discussion of the term and its history, see Perelman (2011).

Finally, in multi-level political systems, lessons from the theory of fiscal federalism need to be taken into account. According to this theory, one factor in determining which level of government should be tasked with certain decisions is that externalities on other parts of the system should ideally be internalised. This principle also applies to industrial policy: it needs to be placed at the correct level of government. Or even better, different levels of government need to be included in the formation and implementation of industrial policy so that it does not create negative external effects for other parts of the system. Positive externalities also need to be taken into account and information only available decentrally can be included in the process of designing and implementing industrial policy. If competencies for industrial policy are placed at an overly low level of government (in the European context, national or regional), the danger is that policies will be geared mostly towards attracting investment from other locations within the federal system, and this will damage the Single Market and create negative externalities for other federal entities.

Current state of a European industrial policy strategy

European industrial policy has experienced some large shifts over the past decades (Dullien et al., 2022). The literature usually distinguishes three to four major phases for this policy field for the period after World War II. Up to the 1980s, national governments were involved in their own interventionist industrial policies, using instruments of vertical industrial policy, with the European Union (or more accurately, its precursors) exercising restraint in limiting the nation states’ interventions. From the 1980s onwards, European institutions started to focus more on market liberalisation and market harmonisation, limiting national autonomy in industrial policymaking in order to promote a single market. Increasingly, vertical industrial policies at the national level were limited, while the European level abstained from vertical industrial policy. This approach was followed through the 1990s into the 2000s.

In recent years,⁴ a new shift towards a more pragmatic approach has been observed. The 2010s already saw a number of new initiatives, both at the European and member state level, such as the joint paper on industrial policy by the German and the French economy ministers in early 2019.

⁴ The literature is not clear on when exactly these “recent years” started, as this policy shift has been less clear-cut. Yet, there is an agreement that more traditional industrial policy interventions have been creeping in during the 2010s. See for a more in-depth discussion Bianchi and Labory (2020), Landesmann and Stöllinger (2020) or Tagliapietra and Veugelers (2020).

Under the Commission of Ursula von der Leyen (from 2019 onwards), industrial policy initiatives mushroomed. Already prior to the COVID-19 pandemic, the Commission had presented its Green Deal to render the European economy climate neutral by 2050. In addition to setting the goal of reducing CO₂ emissions by 55% by 2030, the package “Fit for 55” included a number of specific instruments for reaching this goal, a significant share of which can be considered industrial policies.

Industrial policies were passed due to supply chain disruptions as well as a limited availability of protective gear and other medical products during the COVID-19 pandemic, followed by a major energy price shock resulting from the disruption of natural gas deliveries into the EU in the wake of Russia’s aggression against Ukraine. In addition to European measures to increase the resilience of member states’ energy supply, an important tool was to grant general block exemptions to member states to provide state aid without having to go through the full EU notification channel. The general block exemption regulation was extended in time and expanded in scope in 2020, 2021 and finally in 2023, increasing the ability of member states to provide state aid to the business sector.

Another important tool was the expansion of the EU’s approach of Important Projects of Common European Interest (IPCEI). Since 2018, the EU had granted its member states exemptions to state aid rules in case several of them jointly wanted to support investment and innovation in projects deemed to have a common European interest or to remedy a serious disturbance in the economy. This tool was supercharged in 2021 by allowing member states to use funds from the Recovery and Resilience Facility (RRF) to support IPCEIs.

In 2023, the EU passed the European Chips Act, which allows member states to give state aid to semiconductor producers under certain conditions for investments and innovation, adds some European funds to the subsidies, and introduces a coordination mechanism between the Commission, member states and stakeholders.

Finally, in 2024, the EU passed the Net-Zero Industry Act (NZIA), supposedly as an answer to the US IRA. While the NZIA set targets for domestic production of clean tech equipment, in contrast to the IRA, it lacked large subsidies and financing provisions (Redeker, 2024).

Compared to the key principles for successful industrial policy outlined above, some gaps are evident. First, in contrast to, e.g. the “Made in China 2025” strategy, there is no clear overarching European industrial policy strategy with specific targets that has been communicated so far.

As a consequence, key industrial policy initiatives such as the NZIA lack focus as well as specific instruments. As Redeker (2024) points out, the NZIA mainly streamlines regulation, but delivers very little in terms of tangible instruments or financing. The only real industrial policy tool in the NZIA is to give member states more options to use public procurement at the national level to promote net-zero technologies.

Targets under the NZIA are set on an aggregate level, but not at a firm or sector level, so a stringent framework for following up on performance criteria is not established. Given the limited analytical capabilities of the EU (Jäger, 2024), the vision of an “embedded autonomy” seems completely unrealistic at this point.

While the IPCEIs are in principle a promising tool for conducting effective industrial policy, they lack predictable funding and their governance is only partly aligned with the recommendations deducted from fiscal federalism as outlined above. The first round of these projects was financed primarily by national member states, which constrained the use of this instrument in member states with weaker public finances. For the second round of projects, this issue was mitigated by funding from the RRF. However, as the RRF was explicitly designed as a temporary mechanism, a larger share of financing requirements will be expected from the member states in the future. With financing mainly at the member states’ level, there is a danger that national governments will mainly focus on national rather than European interest in deciding on projects, potentially undermining the Single Market and not making full use of the potential of a hypothetical fully European industrial policy.

The European Chips Act can be seen a bit more positively, as it contains specific funding promises and creates a structure from which over time an effective coordination between the private and public sector could arise. However, as all the other initiatives, the Chips Act also lacks a rigorous cost-benefit analysis.

Conclusion

There are good reasons for a more active European industrial policy, and the EU has both become much more active in implementing industrial policy measures and has expanded its member states’ leeway for implementing such measures at the national level. However, compared to best practice, the European approach falls short. This does not mean that the EU’s measures are misguided or deemed to fail. After all, an in-depth analysis of the IRA would certainly find large gaps between the Act’s general design and lessons from the literature as well. Moreover,

even if the EU's approach is imperfect, in a world of growing industrial policy activism in other blocks, it might be better than a hands-off alternative. However, the contrast between an ideally designed industrial policy and the one actually implemented in Europe hints that there is ample room for improvement and increasing the chances of the EU's industrial policy becoming a success.

References

- Amsden, A. H. (1989). *Asia's next giant. South Korea and late industrialization*. Oxford University Press.
- Bauermann, T., Stephan, S., & Watt, A. (2024). Inflation reduction act: Gut fürs Klima, schlecht für Europa? Erste empirische Befunde für die USA. *IMK Report*, 191.
- Bianchi, P., & Labory, S. (2020). European Industrial Policy. In A. Oqubay, C. Cramer, H.-J. Chang, & R. Kozul-Wright (Eds.), *The Oxford Handbook of Industrial Policy* (pp. 593–620). Oxford University Press.
- Cherif, R., & Hasanov, F. (2019). *The Return of the Policy That Shall Not Be Named. Principles of Industrial Policy*. International Monetary Fund.
- Cimoli, M., Dosi, G., Landesmann, M. A., Mazzucato, M., Page, T., Pianta, M., Stiglitz, J. E., & Walz, R. (2015). Which Industrial Policy Does Europe Need? *Intereconomics*, 50(3), 120–155. <https://www.intereconomics.eu/contents/year/2015/number/3/article/which-industrial-policy-does-europe-need.html>
- Corden, M. (1974). *Trade policy and economic welfare*. Clarendon Press.
- Dullien, S., & Hackenbroich, J. (2022). European industrial policy: a crucial element of strategic autonomy. *IMK Policy Brief*, 130.
- Enderlein, H., Fabry, E., Guttenberg, L., & Redeker, N. (2019). *Beyond Industrial Policy. Why Europe needs a new growth strategy*. Jacques Delors Centre.
- Gomory, R. E., & Baumol, W. J. (2000). *Global trade and conflicting national interests*. MIT Press.
- Hausmann, R., & Rodrik, D. (2003). Economic development as self-discovery. *Journal of Development Economics*, 72(2), 603–633. <https://www.sciencedirect.com/science/article/pii/S030438780300124X>
- International Monetary Fund. (2024a). Expanding Frontiers: Fiscal Policies for Innovation and Technology Diffusion. Chapter 2. International Monetary Fund (Ed.), *Fiscal Monitor 2024*.
- International Monetary Fund. (2024b). *Industrial Policy Coverage in IMF Surveillance – Broad Considerations*. International Monetary Fund.
- Jäger, P. (2024). Flying blind? Why EU administrations need better data and analytical capacities. *Policy Brief*. Jacques Delors Centre.
- Juhász, R., Lane, N., Oehlsen, E., & Pérez, V. C. (2022). *The Who, What, When, and How of Industrial Policy: A Text-Based Approach*.
- Juhász, R., Lane, N., & Rodrik, D. (2024). The New Economics of Industrial Policy. *Annual Review of Economics*, 16(1), 213–242. <https://www.annualreviews.org/content/journals/10.1146/annurev-economics-081023-024638>
- Landesmann, M. A., & Stöllinger, R. (2020). The European Union's Industrial Policy. In A. Oqubay, C. Cramer, H.-J. Chang, & R. Kozul-Wright (Eds.), *The Oxford Handbook of Industrial Policy* (pp. 620–660). Oxford University Press.
- Lee, K., Qu, D., & Mao, Z. (2021). Global Value Chains, Industrial Policy, and Industrial Upgrading: Automotive Sectors in Malaysia, Thailand, and China in Comparison with Korea. *The European Journal of Development Research*, 33(2), 275–303. <https://link.springer.com/article/10.1057/s41287-020-00354-0>
- Luzio, E., & Greenstein, S. (1995). Measuring the Performance of a Protected Infant Industry: The Case of Brazilian Microcomputers. *The Review of Economics and Statistics*, 77(4), 622.
- Mazzucato, M. (2024). Governing the economics of the common good: from correcting market failures to shaping collective goals. *Journal of Economic Policy Reform*, 27(1), 1–24.
- Perelman, M. (2011). Retrospectives: X-Efficiency. *Journal of Economic Perspectives*, 25(4), 211–222.
- Redeker, N. (2024). *Chasing Shadows: What the Net Zero Industry Act Teaches Us About EU Industrial Policy. Policy Position*. Jacques Delors Centre.
- Tagliapietra, S., & Veugelers, R. (2020). *Green Industrial Policy for Europe*. Bruegel Blueprint Series, 31.
- Weiss, J. (2020). Neoclassical Economic Perspectives on Industrial Policy. In A. Oqubay, C. Cramer, H.-J. Chang, & R. Kozul-Wright (Eds.), *The Oxford Handbook of Industrial Policy* (pp. 124–149). Oxford University Press.

Reinhilde Veugelers

An Innovation-Based Industrial Policy for the EU

Recognising the opportunities and challenges of the transition from dirty to clean technologies, economies have ventured into clean tech industrial policy and are competing for their share of the global economic opportunities from clean tech while reconciling their decarbonisation and socio-economic transformation objectives. Another recent trend is the growing emphasis on strategic autonomy and security of supply as an objective in industrial policymaking. A new world of geopolitical and geo-economic competition pushes countries to retake control in strategic industrial sectors or technologies with a directed industrial policy, picking selected targets deemed to be “strategic” for support.

Countries are still figuring out how to reconcile the multi-dimensional objectives of a current day industrial policy, particularly when these dimensions counteract each other. How to combine economic growth, jobs and building globally competitive ecosystems with decarbonisation while assuring resilience and security of supply? A challenge for industrial policymaking is the view that the new geopolitical setting justifies watering down competition policy and using trade policy instruments to build fences around markets. However, if this is translated into restrictive trade policies such as tariffs, local content restrictions and diluted competition policy enforcement to allow local “champions”, would it be at the expense environmental and economic efficiency?

Mastering the multi-dimensionality of industrial policymaking will require the innovation system at full capacity. Innovations can be the cornerstone of a successful tran-

© The Author(s) 2024. Open Access: This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>).

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

* The author would like to acknowledge the support of Bruegel fellows. The many interactions, discussions and collaborative efforts with them are heavily reflected in this contribution. This holds particularly for Simone Tagliapietra, Jeromin Zettelmeyer, André Sapir and Niclas Poitiers during the production of the memos for the next Commission, particularly the ones on the Internal Market and on Research and Innovation.

Reinhilde Veugelers, University of Leuven, Belgium; and Bruegel, Brussels, Belgium.

sition that can reconcile competitive value creation and jobs, decarbonisation and security of supply. The recent Draghi (2024) report rightly lists innovation as a first priority: “First – and most importantly – Europe must profoundly refocus its collective efforts on closing the innovation gap with the US and China... We must unlock our innovative potential” (p. 2).

What will ultimately define the success of an industrial policy is whether it succeeds in unleashing private sector innovative investments to meet society’s net-zero targets in a globally competitive and resilient manner. But the innovation system cannot do this on its own, even if supported by a well-functioning classic horizontal industrial policy ensuring open and contestable markets. In view of the combination of knowledge, environmental and security externalities, together with path dependencies, and considering the urgency, it needs to be properly steered. As a more directed approach is necessary, policymakers need to be able to allocate resources to technologies and projects, without creating more government failures than the market failures they aim to address.

Choosing technologies and projects should also take into account the externalities and path dependencies of any choice on other, non-selected technologies or projects. This calls for a good mix between vertical and horizontal instruments, supported by a regulatory framework that promotes competition and open trade to ensure a predictable and level playing field. Having a vibrant innovation system that encourages a wide pipeline of new ideas for commercialisation should always be high on a directed industry policy agenda in order to be resilient to government failures and allow for future breakthroughs that may not have initially been on the policy radar.

This article first briefly lays out the state of affairs of the EU’s innovation ecosystems to check their capacity to deliver for an innovation-based industrial policy. It then discusses the challenges the EU faces regarding an innovation-based industrial policy and concludes with recommendations.

State of affairs

The EU economy failed in recent years to grow as vigorously as countries in its peer group, particularly the United States: EU GDP per capita has remained stable at two-thirds of the US level (see e.g. Pinkus et al., 2024).

Table 1
Trends in R&D spending (2015/2022)

	EU27	US	China	EU27-US gap (%)
Spending on research and development (% of GDP)	2/2.2	2.8/3.5	1.9/2.4	71/63
Government-financed R&D (% of GDP)	0.64/0.66	0.69/0.69	0.44/0.46	93/97
Business performed R&D (% of GDP)	1.28/1.41	2.02/2.68	1.58/1.87	63/52

Sources: Author's own calculations based on OECD, Main Science and Technology Indicators; National Science Foundation, Science & Engineering Indicators.

On total factor productivity growth, an important driver of GDP growth, the EU has trailed the US since the 1990s. Although it managed to catch up from 2013 to 2019, the US pulled ahead of the EU during the most recent, 2020-2022 period, reflecting its more vigorous recovery from the COVID-19 pandemic.

The EU has been lagging behind in total factor productivity growth, which is related to its business sector innovation performance (see e.g. Pinkus et al., 2024). While the evidence on the recent performance of the EU's research and innovation system compared to the US and China offers some encouraging signs, it contains mostly alarming wake-up calls (see also Veugelers, 2024).

The EU27 spending on R&D (expressed as a share of GDP) hovers around 2% and is still far away from the 3% target the EU had set to achieve by 2010 (Table 1). With the US currently at 3.5%, the spending gap between the EU and the US is widening rather than shrinking. China has also made more progress than the EU27, even managing to overtake the EU27 on this indicator.

Although progress on the public part of R&D expenditure in the EU27 is too slow to reach its stated 1% target, the EU deficit relative to the US on the publicly funded part of R&D is almost on a par. However, it is not the public sector, but the business sector that is responsible for the persistent and growing EU R&D deficit relative to the US.

Looking at science performance, and more particularly high-quality science, as measured by top cited publications, the EU27-US gap is shrinking (Table 2). But it is China that has taken the lead over the US.

While Europe may have pockets of scientific excellence, it typically succeeds less in turning this into great innovative successes. The EU's lag in patent performance over the

Table 2
Trends in scientific performance (2015/2022)

	EU27	US	China	EU27-US gap*
Share of world top 1% most-cited publications, all fields (%)	23/19	33/22	12/25	70/87
Share of world top 100 universities (%)	19/18	48/37	2/11	40/49

Notes: * Numbers represent the position of the EU27 relative to the US (which is scaled to 100), i.e. an EU score of 70 would mean that the EU scores 70% of the US score. Because of whole count of co-publications, country/region shares of world publications do not have to sum to 1. Whole count rather than fractional count is used to avoid penalising international co-publications.

Sources: National Science Foundation; Academic Ranking of World Universities (Shanghai Ranking).

US has been reduced somewhat over time, but again it is China that is rising quickly. The substantial lead that the US enjoyed over China in the Patent Cooperation Treaty (PCT) applications has shrunk extremely rapidly and turned into a lag (Table 3), feeding the US-China technology leadership frenzy.

AI-related publications and patents are a major battleground for "strategic" general-purpose technology. While the EU has a lead, albeit shrinking, in AI-related publications relative to the US, this is absolutely not the case for AI-related patents (see Table 4). This reflects the EU's general and well documented challenge of turning its science into innovation power, coined as the "European paradox" (e.g. Dosi et al., 2004), which also applies to this battleground technology. The EU has been and continues to be a dwarf in AI patents. The AI patent race is between the US and China, with China growing massively and outpacing the US.

Delving further in the EU's persistent business R&D gap, we look at the position of EU firms in the ranking of the

Table 3
Trends in patent performance (2015/2022)

	EU27	US	China	Japan	EU27-US gap*
Share of PCT applications	24/19	28/22	14/26	21/18	84/87

Notes: * Numbers represent the position of the EU27 relative to the US (which is scaled to 100), i.e. an EU score of 70 would mean that the EU scores 70% of the US score. The patent applications filed under the Patent Cooperation Treaty (PCT) show the number of inventions whose owners have sought international protection across many countries or economies simultaneously. It does not include patents filed solely in an inventor's home jurisdiction. Not all applications are subsequently granted. PCT application data are classified based on the receiving office, which usually corresponds to the location of the inventor.

Source: Author's own calculations based on National Science Foundation/World Intellectual Property Organization patent applications filed under the PCT.

Table 4
Science and technology performance in artificial intelligence

	EU27	US	China	EU27-US gap*
Share in AI-related world publications (2015/2022)	28.5/15	18/10	24/34	162/146
Share in world AI patents (2000-2022)	5	22	48	23

Notes: * Numbers represent the position of the EU27 relative to the US (which is scaled to 100), i.e. an EU score of 70 would mean that the EU scores 70% of the US score. Numbers only cover granted international patent families. The technology-level analysis of international patent family data from the European Patent Office's Global Patent Index database covers years since 2000 with AI patents granted.

Source: Author's own calculations, National Science Foundation/PATSTAT.

2,500 companies with highest R&D spending worldwide (EC-JRC EU Industrial R&D Investment Scoreboard). As shown in Table 5, EU27 firms account for less than half of the positions held by US companies in the most recent 2022 Scoreboard, a gap that has widened over time. While China held as many positions in the ranking as the EU27 in 2017, by 2022 it doubled the number of EU27 positions.

The US lead over the EU27 of R&D spending is not only larger but continues to grow: while EU27 corporate R&D spending represented 82% of US spending in 2017, this has declined to only 55% in 2022. US Big Tech firms Alphabet, Meta, Microsoft and Apple take up the top four places on the Scoreboard in 2022, followed by China's Huawei in fifth place. The first EU27 firm on the Scoreboard is Volkswagen (sixth place). Volkswagen had first place in 2014 (see also Fuest et al., 2024).

The continued and increasing dominance of the US over the EU27 and the catching up of China is very much driven by sectoral composition. We briefly zoom in on differences between and within the sectors in the EU and US (see also Pinkus et al., 2024). The largest and strongest growing sector in the innovation landscape is ICT (broadly defined as electronics, hard and software, and services), clearly a high-tech sector with a high R&D intensity. The overall high corporate R&D-to-sales ratio of the US compared to the EU corresponds to the US having a strong presence of firms in this sector and with a high R&D intensity. EU27 has significantly fewer ICT firms among its Scoreboard firms; additionally, the ones it does have are less R&D intensive. This is mostly due to the absence of software and services ICT firms, which have particularly high R&D intensity. Looking at the top 10% of largest ICT R&D spenders, the EU is lagging even further behind. US firms sit firmly on top in this sector (holding half of the top 10% of the largest positions). Although Chinese firms are

Table 5
Trends in global business R&D

	Share in no. of 2500 firms	Share in no. of 250 firms	Share in R&D	R&D to sales
2017				
CN	0.18	0.10	0.10	2.8
US	0.31	0.36	0.37	6.3
JAP	0.14	0.18	0.14	3.4
EU27	0.18	0.23	0.23	3.6
2022				
CN	0.27	0.19	0.18	3.8
US	0.33	0.36	0.42	8.1
JAP	0.09	0.12	0.09	3.8
EU27	0.15	0.20	0.18	3.8

Source: Author's own calculations based on EC-JRC Scoreboard data.

still far behind in terms of size of their R&D budgets, they nevertheless have made progress in the top decile of R&D spenders, illustrating the intensity of the US-China battle for digital technology leadership.

Health is the second most important sector in the innovation landscape, also a clear high-tech sector with a high R&D intensity. The US has many more Scoreboard firms than the EU27 (see Table 6). However, the health firms that the EU27 has in this sector are on average only mildly less R&D intensive than their US counterparts.

Table 6
Trends in business R&D in major sectors

2022	Share of sector in region's total no. of scoreboard firms			Sector's R&D to sales			
	ICT	Health	Cars	ICT	Health	Cars	All sectors
World	33.0	23.4	6.7	8.8	12.9	4.8	4.7
CN	35.6	14.6	7.1	7.7	7.6	5.2	3.8
US	37.5	38.6	4.4	12.3	13.1	5.1	8.1
EU27	19.6	18.8	12.3	7.2	11.6	5.5	3.8

2022	Share of region in sector total R&D				Share of region in sector top 10% scoreboard firms		
	ICT	Health	Cars	All	ICT	Health	Cars
CN	18	6	13	18	18	3	12
US	55	52	19	42	49	53	18
EU27	9	17	42	18	7	19	41

Source: Author's own calculations based on EC-JRC Scoreboard data.

As shown in Table 6, the sector where the EU27 has been dominating in terms of the number of Scoreboard firms is cars (and automotive parts), but this is a sector that has a relatively low R&D intensity (medium-tech). EU firms in this sector are not particularly more R&D intensive than their foreign counterparts. A strong concentration in this medium-tech sector contributes to the significantly lower overall corporate R&D intensity of the EU, dubbed by others as the EU's "mid-tech trap" (see Gros et al., 2024). Here, as well, there is no room for complacency. Firms are increasingly being challenged by the new wave of interconnected, autonomous and electric cars from China and the US.

Another striking difference between the EU and the US (and China) is the age of its leading Scoreboard firms. This is most striking in ICT: the sector top five are seasoned, but still relatively young stars (Alphabet, Meta, Microsoft, Apple and Huawei), while stellar growers like Nvidia, established in 1993, was ranked 26 in 2022. The highest EU R&D spender in ICT is incumbent SAP followed by Nokia and Ericsson. Relatively young star ASML (established in 1984) ranks 36. In cars, all EU leading firms are incumbents, while Tesla is the US's highest R&D spender in this sector and BYD is China's second largest R&D spender. The same issue of firm age prevails in the health sector. Of the 31 US health firms in the top 10% of R&D spenders, 11 are new (including Gilead, Amgen, Novavax and Moderna). In contrast, the EU has only one new health firm, BioNTech, among its largest R&D spending companies.

Overall, the evidence on the performance of the EU's Science and Innovation System relative to the US is bad news. The major source of its lagging behind and failure to catch up with the US is not so much in its public funding and its science, but in its business sector R&D. While Europe might have pockets of scientific excellence, it is typically less successful at turning this into great innovative achievements. Compared to the US, and more recently China, who hosts most of the (new) R&D leaders (especially in digital sectors but also in other digital/AI using sectors such as pharma and automobiles), the EU corporate R&D system has a much weaker Schumpeterian creative-destruction power, generating fewer new innovators or dynamic incumbent leaders. These challenges are not new, but have become more urgent in a fast changing and highly competitive global technology environment.

EU's challenge to have a single market for an innovation-based industrial policy

The EU's corporate growth and innovation performance has many potential drivers, but its Single Market with

more than 440 million consumers and large scope for economies of scale and ecosystems, is a critical one, certainly when having to compete with US and Chinese firms.

Access to large markets for customers, suppliers, skills, resources and finance have become even more pivotal for firms investing in the current fast changing winner-takes-most global corporate landscape, where being able to scale fast has become more important. The cost of not having a single market for services has increased in a world dominated by digital giants. The cost of not having an integrated labour market has increased in a world in which productivity relies on the mobilisation of highly specialised skills in the creation and use of digital technology. The cost of not having a unified capital market has increased in a winner-takes-most world in which firms need to find the finances to rapidly scale their investments to compete in world markets. Also the increased turbulence in markets from geopolitical, climate and global health shocks, which require more resilient supply chains, upgrades the Single Market to a first class policy tool: the scale offered by the Single Market makes it a most efficient and effective tool to make us resilient to shocks (Poitiers et al., 2024).

It is thus quite natural to look at how the EU Single Market is performing as a driver of corporate innovation and productivity growth in the EU (see also Poitiers et al., 2024). While the costs of intra-EU trade have been falling continuously since the 1990s (e.g. Head & Mayer, 2021), it is also clear that the internal market remains a far cry from a fully integrated market. In its most recent 2024 Annual Single Market and Competitiveness Report, the European Commission had to acknowledge a stalling in its Single Market Programme. Looking at the trends in intra-EU trade flows (as a share of GDP) as a measure of EU internal market integration, the report shows that for goods this has been steadily increasing, reaching 26% in 2022 (up from 20% in 2013). Nevertheless, while this is consistently higher than the EU's share from extra-EU trade in goods (18% in 2022), internal market integration did not move faster than the EU's integration in world markets (12% in 2013). Goods trade between regions within the same member state is four times as large as trade across regions located in different EU countries (Santamaria et al., 2024). But it is particularly for services that the trend in market integration is bleak: intra-EU trade in services represented 7.5% of EU GDP in 2022, which is only marginally higher than what it was in 2013 (6%) and fails to rise above the share of extra-EU trade in services (7.7%). Costs of migration across EU borders remain almost ten times higher than across US states (Head & Mayer, 2021).

Multiple reports by both the European Commission and outside authors (e.g. Dahlberg et al., 2020) have sought to identify the actual barriers that keep causing these frictions. EU countries differ in terms of industrial structure, geography, firm and consumer demography and preferences. These differences imply that EU-level proposals for harmonisation can be divisive (and they usually are), even mutual recognition if the distance between specific regulations is too wide. This has been delaying progress in completing the Single Market, e.g. with regards to regulated services; has resulted in complex regulatory designs in an attempt to accommodate heterogeneity; and has resulted in consistent transposition or implementation deficits.

Recommendations for an EU innovation-based industrial policy

Given how structural, long-standing and serious the EU's deficient innovation and growth performance is, a big jump in policymaking will be needed, as also noted by Draghi (2024). Massive investments will be needed, and not only from public investments. The key is to leverage private innovative investments.

Central to an innovation-based industrial policy strategy are public-private partnerships, where public entities mobilise the innovation capacity, information and resources at firms and research entities so as to develop and deploy new solutions. Coordination among the many different types of stakeholders, policy governance areas, instruments and projects requires strong operational governance for a successful innovation-based industrial policy. And as a more directed approach is necessary, policymakers need to have a stronger governance structure to build the information capacity to allocate resources to technologies, projects and entities (see also Tagliapietra & Veugelers, 2021; 2023).

Such an innovation-based industrial policy is not proven yet, and will therefore require experimentation and flexible policy design, where learning, monitoring and evaluating on key performance indicators is tantamount. In the following section, we zero in on what this would imply for industrial policymaking reforms at the EU level, taking an innovation based approach.

An EU-level industrial policy centred around innovation and leveraging the Single Market

More public funding support can help to address the EU's business innovation debacle, but only if flanked by policies with framework conditions that shape the incentives for private investments in research and innovation.

The most important framework condition is a large, integrated and open competitive EU market, providing access to customers, suppliers, skills, as well as finance for innovative ideas to be commercialised. The challenge is not only to invigorate an EU Single Market regulatory policy that can effectively raise corporate innovation investments and productivity growth, but also to ensure that the complementary policies needed for a strong Single Market are properly tuned, particularly competition policy and trade policy.

At the same time, the right vertical policies are needed. Smart subsidisation is the key to avoiding the waste of public money and distortive interventions. Support needs to be carefully and smartly targeting those areas where market and ecosystem failures prohibit the building or maintaining of solid comparative advantages, particularly in technologies and markets of EU societal concerns, such as clean tech and resilience. This directedness applies particularly to projects that have the potential to be the next big breakthrough, but whose high-risk profile impedes private support. This is true in particular for new companies and new ecosystems, as limited access to finance may impede their investments to scale their commercialisation.

It cannot be emphasised enough that vertical policies, which target specific areas, need to be flanked by a Single Market regulation agenda, supported by competition and trade policies as major horizontal instruments in an innovation-industrial policy toolbox. Without such complementary horizontal policies, vertical policies will be far less efficient (Poitiers et al., 2024).

A better governed and evidence-supported EU industrial-innovation policy

Given the inherent complexities of both innovation-industrial policy and the EU as policymaking machinery, strong governance is a prerequisite for an effective EU innovation-industrial policy. Only leadership that is competent, independent, accountable to meet goals and milestones, and that encourages risk-taking may coordinate the progress of different government groups across policy competences and across geographic levels.

This EU body should be flanked with a monitoring, analysis and evaluation (M&A&E) unit of experts. They should provide the evidence base for EU policy actions in order to identify the actions with the highest efficiency and effectiveness, as well as the possibilities for the biggest bottlenecks, the highest returns and the lowest costs of implementation. These experts should monitor instruments to determine whether they are on track to deliver

on their targets and regularly evaluate the mix of policy tools in order to come up with alternatives when instruments are not delivering.

Taking an evidence-based approach means looking at how EU funding complements other public funding at the EU level (e.g. structural and regional funding), the European Investment Bank, Innovation Fund and the much bigger pots of national and regional funding for research and innovation. It also means assessing whether complementary policies are in place at EU and member-state levels to address any missing framework conditions necessary to leverage research and innovation investment into sustainable economic effects.

Taking an effects-based approach requires a monitoring and evaluation capacity that encompasses *ex ante* and *ex post* micro and macro assessments of long- and short-run impacts from policy instruments, both at the level of individual instruments as well as the whole portfolio. This should involve a permanent in-house monitoring and evaluation capacity based on open source data and methodologies such that external expertise can validate and complement internal analysis. This M&A&E toolbox will be needed not only for EU instruments, but also to support its pivotal role in coordinating with other policy-makers. More and better quality analysis can rebuild trust in EU instruments, most notably its internal market and its Framework Programme, demonstrating how EU instruments will provide benefits for member states beyond the euros that are directly allocated to them and by showing how their gains from EU instruments can be amplified by complementary local policies.

A Single Market 2.0 industrial policy

The Single Market truly is the EU's greatest asset for incentivising innovative investments. Only a well-functioning, globally linked EU market will indeed be able to achieve a similar scale to the domestic markets of the United States, China or India. Fragmented national measures will not lead to private innovative investments at the scale that Europe needs to become globally competitive in the key markets of the future, such as batteries or electric cars.

To achieve this, the EU needs to foster and deepen its Single Market for goods, services, finance, energy, people and ideas. It is the carrot of the win-win effects from the innovation and growth potential of the Single Market that should mobilise and align member states' interests on the Single Market 2.0 agenda.

From the long list of valuable suggestions for a Single Market 2.0 agenda (see Letti, 2024), we would like to

bring a few to the forefront, as they are likely to be high-leverage actions on the EU's innovation capacity, to be confirmed by M&A&E.

A 28th regime European Code of Business Law would be a transformative step towards a more unified Single Market, providing businesses with tools to operate within the Single Market. This Code will supplement national laws with a new instrument that businesses can choose to utilise. A European Business Code would provide businesses, especially new fast growing firms, with a 28th regime to aid their Europeanisation, making the Single Market their home market. It may also make it easier to incentivise venture capital to finance EU scaling firms, avoiding the need to navigate across the patchwork of national laws to assess their investability.

To be truly growth enhancing, the EU Single Market should be open and competitive. For this, it is essential to preserve the power of the EU's competition policy toolbox to avoid incumbency, protectionism and rent-seeking traps. This competition policy toolbox needs to evolve to look more dynamically at innovation markets, preserving markets that can be contested by new innovative projects. At the same time, EU trade policy should not fall into a reciprocal protectionist trap: it needs to remain open to allow the EU to import intermediate goods and natural resources that it cannot competitively produce itself, and to help keep export markets open.

EU public financing support programmes for innovation

While the European Commission leads on Single Market regulation, competition and trade policy, it has much weaker instruments to influence public investment. Most of public spending in the EU is done at the member state level. The Horizon Europe budget for research and innovation (R&I) only covers about 7% of public R&I spending by EU countries. But it can control national support policies through its EU state aid competence. For this, the EU State Aid Guidelines cannot be watered down, a tendency suggested by the evidence on the large increases in both the level and the cross-country dispersion of subsidies that have occurred because of recent crises, which have led to special legal regimes (e.g. Kleimann et al., 2023; Tagliapietra et al., 2023).

Since the EU can only go so far to steer coordination, it must be able, as part of the vertical industrial policy, to offer financial incentives in subsidiarity with national and regional incentives. Its own budget is only a small part of total EU public spending. EU funds will be needed for cases where the cross-EU externalities and resource mis-

allocation from fragmented national state-aid policy interventions are sizeable. This is why the EU needs to have a relevant “federal” budget. But beyond the size of the budget, a first issue is how to design the EU budget, identifying instruments where the EU can provide a clear value added over national or regional instruments. The M&A&E unit will need to provide this *ex ante* and *ex post* assessment. In what follows, we highlight some candidates for EU programmes to pass this test (see also Veugelers, 2024; Poitiers et al., 2024).

The Important Project of Common European Interest (IPCEI)/Alliances format, being a good example of the needed public-private partnerships (see above), can be strengthened with EU funding and more coordination. Current schemes are thin on synergy effects from cross-country collaboration, bureaucratically heavy and end up mostly supporting a few large incumbent firms that have the ability and experience to propose and manage such projects, which typically take place in the EU countries that have sufficiently deep pockets to support them. EU top-up funding will allow for projects with large spillovers that may have otherwise been overlooked due to a lack of capacity from MS with funding constraints. While large firms can play an anchor role in such projects, it is important to ensure that smaller players and radically new ecosystems can find their place. Otherwise, the risk is that the IPCEI format will fail to pick disruptive new technology solutions.

When it comes to strategic procurement, EU funds could be used to partly fund national public procurement of innovative technologies and encourage their roll-out at EU scale, sharing costs and risks with the government entities undertaking the procurement. Such topping up could help leverage the large amounts of public resources spent through innovative public procurement across the EU for the innovation-industrial policy agenda (see also Sapir et al., 2022).

The EU’s aspiring entrepreneurs, especially younger, more radical innovators, face obstacles in bringing their ideas to commercial fruition, particularly in relation to risk finance. Public funding support could help to address this barrier. Horizon Europe with its Open Innovation pillar and its new instrument, the European Innovation Council (EIC), took a clear step towards addressing this issue. Yet, as various support schemes already exist in member states and at the European level (for example, the European Investment Fund), the question is what new unique value added can the EIC bring to the public funding landscape in terms of subsidiarity and complementarity to other instruments. The value added of the EIC over similar instruments lies in its EU-level scope being a critical quality label. Being an EIC grantee could and should become

a valuable certification, which will help them secure other funding. For this, it is critical that an EIC governance model like the European Research Council (ERC) is installed, based on a sufficiently autonomous council composed of recognised technology leaders who can design the programme and select the evaluators. The potential for EIC value added is more obvious for high-risk proposals in their early stages of financing, when certification is much more critical. And, like the ERC, the EIC should be fully based on bottom-up proposals from entrepreneurs and not confined to specific top-down selected areas or other requirements such as collaboration.

Researcher mobility is a critical pathway for knowledge networks, collaboration, connectivity and spillovers. The Framework Programme instrument for research mobility is the Marie Skłodowska Curie Actions (MSCA). Yet, only a small part of the current MSCA budget, already relatively small, is spent on individual fellowships for mobility. Sending more EU researchers from academia to industry across borders will help bridge the EU’s gap between science and the commercialisation of innovative ideas. It would help address the skills shortfalls that are identified by start-ups as a constraint in scaling up, and by companies as a major constraint in adopting new digital technologies. Scaling up the MSCA for industry-science mobility and more targeting of MSCA mobility fellowships to specific missions would help address the European paradox and improve knowledge spillovers in key areas, such as AI.

Still underdeveloped in the current EU toolbox is a truly directed, missions-oriented perspective, with efforts fragmented and poorly implemented across various new initiatives. The “missions” programme of Horizon Europe is co-designed with stakeholders and managed by EU high-level officials, leaving a high government failure risk with allocations and specifications that best fit existing stakeholders. Still lacking is a Defense Advanced Research Projects Agency-type of a goals-oriented, top-down approach supporting high-risk, high-gain projects. Like Fuest et al. (2024) and Draghi (2024), we advocate the creation of an EU Advanced Research Projects Agency (ARPA), run by an independent agency, endowed with a dedicated budget to allocate to precisely defined missions related to EU policy priorities. The EU ARPA could have several sections (e.g. an EU-ARPA-Energy, EU-ARPA-Climate, EU-ARPA-Health, EU-ARPA-Defence). An ARPA-style approach requires sufficient funding – part of which could originate in the reallocation of existing budgets – to allow it to make multiple bets within a portfolio approach. Equally important is to design it properly, most notably, granting it autonomy and organisational flexibility, to recruit and accommodate the venture capital entrepreneur type of policy officers. Calls must have clear quantifiable

goals and trackable metrics, so that policy officers can be given elevated levels of autonomy, together with clear accountability. Because of its distinct features, it should not be integrated with the EIC, but rather be a dedicated agency.

References

- Dosi, G., Llerena, P., & Labini, M. (2006). The relationships between science, technologies and their industrial exploitation: An illustration through the myths and realities of the so-called 'European Paradox'. *Research Policy*, 35(10), 1450–1464.
- Dahlberg, E., Dalla Pozza, V., Di Salvo, M., Kubovicova, K., Marcus, S., Næss-Schmidt, S., Pelkmans J., & Virtanen L. (2020). *Legal Obstacles in Member States to Single Market Rules*. Study requested by the IMCO committee of the European Parliament.
- Draghi, M. (2024). *The Future of European Competitiveness* (Report for the European Commission).
- European Commission. (1985). *Completing the internal market: white paper from the Commission to the European Council*. COM//310 final.
- European Commission. (2020). *Long term action plan for better implementation and enforcement of single market rules*. COM/94 final.
- European Commission. (2022). *The 2022 EU Industrial R&D Investment Scoreboard*. Publications Office of the European Union. Joint Research Centre.
- Fuest, C., Gros, D., Mengel, P. L., Presidente, G., & Tirole, J. J. (2024). *EU innovation policy: How to escape the Middle Technology Trap*. Ifo Institute.
- Head, K., & Mayer, T. (2021). The United States of Europe: A Gravity Model Evaluation of the Four Freedoms. *Journal of Economic Perspectives*, 35(2), 23–48.
- Kleimann, D., Poitiers, N., Sapir, A., Tagliapietra, S., Véron, N., Veugelers, R., & Zettelmeyer, J. (2023). Green tech race? The US Inflation Reduction Act and the EU Net Zero Industry Act. *The World Economy*, 46(12), 3420–3434.
- Letta, E. (2024). *Much More Than a Market* (Report to the European Council). National Science Board. (2024). *The State of US Science & Engineering 2022*. <https://www.nsf.gov/nsb/sei/>
- OECD. (2022). *Main Science and Technology Indicators*. https://www.oecd-ilibrary.org/science-and-technology/main-science-and-technology-indicators_2304277x
- Poitiers, N., Tagliapietra, S., Veugelers, R., & Zettelmeyer, J. (2024). *Memo to the commissioner responsible for the internal market*. Bruegel Publications.
- Pinkus, D., Pisani-Ferry, J., Tagliapietra, S., Veugelers, R., Zachmann G., & Zettelmeyer, J. (2024). *Coordination for competitiveness*. Study requested by the ECON committee, European Parliament.
- Santamaria, M., Ventura, J., & Yeşilbayraktar, U. (2024). *Borders within Europe*. Mimeo.
- Sapir, A., T. Schraepen & Tagliapietra, S. (2022). 'Green Public Procurement: A Neglected Tool in the European Green Deal Toolbox?' *Intereconomics*, 57(3), 175–178.
- Tagliapietra, S., & Veugelers, R. (2021). Fostering the Industrial Component of the European Green Deal: Key Principles and Policy Options. *Intereconomics*, 56(6), 305–310.
- Tagliapietra, S., & Veugelers, R. (Eds). (2023). Sparking Europe's New Industrial Revolution: A policy for net zero growth and resilience. *Bruegel Blueprint series*.
- Tagliapietra, S., Veugelers, R., & Zettelmeyer, J. (2023). Rebooting the European Union's Net Zero Industry Act. *Bruegel Policy Brief*, 15/2023. <https://www.bruegel.org/policy-brief/rebooting-european-unions-net-zero-industry-act>
- Veugelers, R. (2024). *Memo to the Commissioner for Research and Innovation*. Bruegel publications.

Intereconomics

Review of European Economic Policy



Sign up

for the bimonthly
Intereconomics
NEWSLETTER



Stay up to **DATE** on

- Wide-ranging debates on current European economic and political issues
- The latest macroeconomic analysis and commentary
- Transatlantic economic perspectives in the Letter from America

→ Sign up today at

www.intereconomics.eu/newsletter

Fabrice Naumann and Monika Schnitzer

Rationales for Industrial Policy in the Semiconductor Industry

In recent years, private and public investments in the semiconductor industry have surged worldwide. In the European Union alone, a government subsidy package of €43 billion is under negotiation, while in the United States and East Asia, state support amounts to multiples of that figure. Economists view this subsidy race critically, as it could potentially lead to market distortions and inefficient allocations. In Germany, the substantial subsidies for new factories by Taiwan Semiconductor Manufacturing Company Limited (TSMC) and Intel are also the subjects of heated debate. Despite these concerns and the traditional reservations among economists against industrial policy in general, there are compelling reasons for pursuing such an industrial policy approach, particularly in the European semiconductor industry—provided the economic and political contexts are understood, and the policy is well executed.

Recent crisis

The semiconductor crisis has caused significant economic disruptions in European industry. The automotive sector was severely affected, with chip shortages leading to a global reduction in vehicle production by approximately 9.5 million units in 2021, of which around 2.4 million would have been produced in Europe (Verband der Automobilindustrie, 2023). These shortages resulted from complex supply chain issues, exacerbated by the automotive industry's reliance on a "just-in-time" production model, which quickly led to production halts when unexpected disruptions occurred (McKinsey, 2022).

In addition to the automotive industry, the high-tech and consumer electronics sectors were heavily impacted. The shortage of semiconductors led to a deterioration in the supply situation, forcing companies worldwide to reduce or completely shut down their production capacities. This crisis highlighted the vulnerability of the European economy resulting from its dependence on external suppliers

© The Author(s) 2024. Open Access: This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>).

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

Fabrice Naumann, Ludwig-Maximilians-Universität München, Munich, Germany.

Monika Schnitzer, Ludwig-Maximilians-Universität München, Munich, Germany.

and led to significant economic damage through production losses and revenue declines. Both the electronics and automotive industries continued to struggle with supply shortages, particularly semiconductors, well into 2023 (ifo Institut, 2023).

Current position of Europe

The European semiconductor industry plays a crucial role in the global supply chain but faces significant challenges. Europe excels in specialised areas like semiconductor manufacturing equipment, particularly with companies like Advanced Semiconductor Materials Lithography (ASML), a Dutch company that leads in lithography systems that are crucial to the production of semiconductors. However, Europe lags in key segments such as wafer fabrication, where the market is dominated by East Asia and the United States. This geographical concentration outside of Europe poses a strategic risk, as disruptions in global supply can severely impact European industries, especially those reliant on advanced semiconductor technologies, as experienced over the last years (Boston Consulting Group, 2024).

This strategic importance of semiconductors is going to increase manifold in the coming years and decades. Semiconductors are vital for achieving overarching European goals such as climate neutrality and digital transformation. They are essential components in renewable energy technologies, electric vehicles and smart grids, all of which are critical for meeting the EU's climate objectives. Moreover, semiconductors underpin the digital infrastructure necessary for advancing Europe's digitalisation agenda, which includes the deployment of 5G networks, artificial intelligence (AI) and the Internet of Things (IoT). AI advancements have been driven by significant progress in semiconductors. New studies show, however, that the computing power required to train cutting-edge AI is growing faster than semiconductor productivity, despite advances in line with Moore's law. The rapid growth in data used in training AI has led to an unprecedented demand for processing power, with Nvidia graphics processing units – crucial for training large language models – experiencing severe shortages. This shortage is seen by some as a clear indication that processing power could become a critical bottleneck in the development of advanced AI systems (Miller, 2024).

Moreover, experts predict that the demand for semiconductors in the automotive industry alone will triple

by 2030, further increasing the need for robust supply chains and amplifying the importance of semiconductor production for the European economy (Boston Consulting Group, 2024).

The ability to produce and innovate in semiconductor technologies is, therefore, not only an industrial necessity but also a strategic imperative for Europe's broader economic and environmental ambitions. But it is a global race. Global competition has driven governments to invest heavily in their semiconductor industries. China initiated the current wave of chip subsidies in 2014 by designating semiconductors as crucial to its "Made in China 2025" strategy and launching a National Integrated Circuit Industry Investment Fund to support semiconductor growth. In response, Japan has provided funding for foreign companies like TSMC and Micron to establish or upgrade facilities and has created a new chipmaker, Rapidus, to advance cutting-edge manufacturing. Similarly, the US and the EU have each introduced "Chips Acts," committing tens of billions of dollars to attract and expand chip investments (Miller, 2024).

Rationales for industrial policy

There are strong arguments for targeted industrial policy in the European semiconductor industry, particularly when considering the market failures that private companies alone are unlikely to address effectively. These arguments can be understood through the lenses of externalities, coordination failures and the need for specific public inputs, as described by Juhász and Lane (2024).

The complex global value chains in the semiconductor industry have become vulnerable due to the pandemic and various geopolitical conflicts. European companies are embedded in complex supply chains and do not internalise all the risks across the entire value chain. The supply chain disruption in the semiconductor industry described above illustrates the problems that arise if companies do not diversify their input suppliers because they underestimate the risk of such disruptions and do not consider the negative externalities a disruption causes beyond their own company. The problem is even more severe if all companies rely on the same source because it is the cheapest one.

To make local, usually downstream, value creation more resilient, it is beneficial to establish upstream production steps within the region. Building these capacities can also make additional upstream production processes or raw material extraction in Europe economically viable, further developing local value creation. The more steps in the value chain can be accessed with reduced risk, the

better crisis prevention can be managed through inventory and safety capacities – countering the often-voiced scepticism that critical dependencies on individual inputs or raw materials will persist. Incentivising and coordinating companies to diversify their input suppliers would also help solve this problem, as some critics have suggested. Yet, this would not be sufficient to internalise other externalities present in the semiconductor industry.

The semiconductor industry was recognised a long time ago for its high learning-by-doing rates and across-firm learning spillovers (Irwin & Klenow, 1994). Companies like ASML, a Dutch leader in lithography systems, exemplify this. Their continuous innovation benefits not only their own production processes but also the entire semiconductor ecosystem (Goldberg et al., 2024).

Moreover, technological spillovers occur substantially across borders when foreign direct investment (FDI) brings advanced technology into a region, allowing local firms to benefit from the expertise and processes developed elsewhere (Goldberg et al., 2024). The investment by TSMC, a leading semiconductor producer from Taiwan, in a new factory in Dresden is expected to bring such a knowledge transfer. Typically, European firms invest outside the EU, leading to technology spillovers in those regions. However, TSMC's investment reverses this trend, bringing cutting-edge technology to Europe. This FDI enables European firms to learn from TSMC's advanced production techniques, enhancing the region's technological capabilities.

The semiconductor industry has the potential to create high-quality jobs, which provide significant social benefits, known as the good-jobs externality. TSMC's expansion in Germany, for instance, is expected to create thousands of highly skilled positions with wages and conditions that far exceed those in many other sectors. Such jobs contribute to reducing inequality and enhancing social stability. However, private firms may not prioritise these broader social benefits in their investment decisions, making public intervention necessary to ensure these jobs are created and maintained (Rodrik, 2022).

Next, the semiconductor industry relies on a complex, highly specialised supply chain. For instance, the collaboration between European firms like Infineon and various suppliers is critical for maintaining production capacity. Without coordinated investments across the supply chain, firms may hesitate to expand or adopt new technologies, leading to inefficiencies. Government policy can play a crucial role in synchronising these investments, ensuring that the necessary infrastructure and capabilities are developed across the entire supply

chain. Again, TSMC investment in Dresden is a good example. The Taiwan-based company forms a joint venture with the locally active firms Infineon, Bosch and NXP. This secures them a substantial share in production capacity, which they could not afford individually due to high upfront costs.

Lastly, semiconductor manufacturing is not only capital-intensive but also requires a highly skilled workforce and cutting-edge research facilities. Companies like GlobalFoundries, which operates in Germany, depend on a strong educational and technological ecosystem to support their operations. Private firms alone may not invest sufficiently in these public goods, as the benefits are widely shared across the industry. Customisation is key here. Bartik (2020) has shown that instead of offering subsidies, providing current and potential investors with tailored business services and inputs is much more efficient. He estimates that public investments in infrastructure, manufacturing support, specialised training programmes, and brownfield redevelopment create new jobs at a much lower cost.

Letting losers go

Despite strong theoretical arguments supporting industrial policy for the European semiconductor industry, critics often point to negative examples of ill-guided industrial policy from the past, arguing that policymakers are not adept at selecting winners in advance.

Indeed, industrial policy often involves the challenging task of determining who should receive financial support and investment. A critical issue with this approach is the inherent difficulty in accurately identifying the “winners” before they emerge. Governments and policymakers typically do not have access to all the necessary information, and the future performance of industries or companies is notoriously hard to predict. This uncertainty makes it difficult to guarantee that public funds will be directed towards ventures that will succeed. The risk of misallocation is high, leading to potential inefficiencies where resources are wasted on projects that do not deliver the expected returns.

Yet, a more pragmatic approach to industrial policy does not focus on picking winners in advance but rather on establishing mechanisms that allow for the efficient identification and termination of failing projects (Juhász et al., 2024). This concept is rooted in the idea that it is often easier and more effective to design policies that let “losers” go, rather than trying to predict and select “winners” from the outset. Such an approach allows for the possibility of failure, which is an inherent part of innovation and economic experimentation, without locking in resources to unsuccessful projects indefinitely.

In fact, a well-constructed industrial policy acknowledges that some supported ventures will fail and that this is a normal and even necessary part of the process. The goal is not to avoid failure entirely but to create a dynamic system where unsuccessful projects can be identified and phased out, allowing resources to be reallocated to more promising opportunities. This requires the implementation of clear benchmarks, regular monitoring and the flexibility to withdraw support when it becomes evident that a project is not meeting its goals.

Despite high hopes for the future, there is no guarantee of success for the semiconductor industry. If new strategic options open up in global competition in the future or if the aforementioned externalities of the investments do not materialise to a sufficient extent, then projects will have to be dropped here, too, regardless of their size. Thus, following a more nuanced strategy, industrial policy should be designed to be adaptive, allowing for a portfolio of investments where some are expected to fail. In this way, the role of the state is not to guarantee success for every supported project but to ensure that the overall direction of investment is towards sectors with the potential for significant economic and social returns.

This approach also mitigates the risks of political capture and rent-seeking, where resources might otherwise be directed based on political favouritism rather than economic merit. By focusing on mechanisms that phase out failing projects, the state can avoid prolonged support for ventures that do not contribute to broader economic goals, thereby improving the overall efficiency and effectiveness of industrial policy. However, even this approach must consider the inherent political pressures and constraints within the political system, which are crucial to acknowledge, as discussed below.

Political economy

Beyond economic constraints, the governance challenges inherent in industrial policy mean that the policies implemented often diverge significantly from the theoretical economic ideals. In other words, the realities of political processes shape the policies we ultimately see, explaining why they frequently differ from the “optimal” policies that a theoretical social planner might choose.

For example, it is crucial to address the issues of political credibility and time inconsistency. Policies often require long-term commitments, but political cycles and changing governments can create uncertainty. This uncertainty can deter private sector investment if companies fear that future administrations might reverse or alter current policies. In the semiconductor industry, companies need as-

insurance that the government is willing to take substantial risks but also will consistently pursue its strategic goals, such as climate transformation, digital transformation, securing skilled labour, supporting R&D and providing physical infrastructure because otherwise they may be reluctant to commit substantial resources. To mitigate this, policies should include mechanisms that ensure long-term political stability, such as cross-party agreements or legally binding frameworks.

Another issue is that the benefits of industrial policies are often concentrated among specific groups, while their costs are spread more broadly, making them politically contentious. By altering economic equilibria, these policies can disrupt the political status quo. While individual companies like TSMC or Infineon receive substantial government funding, the general public bears the costs. To justify these costs, it is important to communicate that this support benefits an entire industry, which gains through the aforementioned externalities and simultaneously serves as the backbone for many other industries in different regions.

At the same time, it would be naïve to overlook the impact that political incentives have on the decisions on specific projects. The industrial policies we see are often those that align with the prevailing political context. Policymakers face pressure to prioritise short-term political gains or respond to powerful interest groups, and this can lead to policies that favour certain sectors or regions rather than focusing on the broader economic good. Understanding the political economy of policy decisions is essential for grasping why policies succeed or fail and should inform their design, as proposed by Juhász and Lane (2024). Effective industrial policy must navigate the political realities by creating transparent, inclusive processes that balance diverse interests and align short-term political incentives with long-term strategic goals, ensuring that policies are both politically feasible and economically sound.

Recent empirical evidence for industrial policy

Recent studies have re-examined sectoral industrial policies, focusing on historical case studies in textiles, shipbuilding, and heavy industries across various countries. For example, Juhász (2018) analysed France's cotton spinning industry during the Napoleonic blockade (1806–1813), finding that temporary protection fostered long-term industrial capacity. Hanlon (2020) explored shipbuilding in North America during the late 19th century, where natural barriers and protective tariffs facilitated the adoption of metal shipbuilding. Lane (2022) studied South Korea's heavy chemical industry drive in the 1970s, which drastically shifted the country's industrial structure

through targeted investments and subsidies. These examples demonstrate that sectoral policies can catalyse significant structural changes but often involve substantial experimentation costs.

Other studies suggest that mission-oriented R&D policies can drive substantial technological advancements and regional economic growth, though their success often hinges on targeting already innovative regions. Gross and Sampat (2023) analysed the impact of massive government R&D investments during WWII, finding long-lasting shifts in the geographic distribution of US innovation, particularly toward electronics and communications. Similarly, Kantor and Whalley (2023) studied the Apollo mission's economic effects, noting significant local increases in manufacturing value added.

Another strand of the literature focuses on place-based industrial policies targeting specific regions to stimulate economic development, often in distressed or lagging areas. Garin and Rothbaum (2024) examined US government-built manufacturing plants during WWII in non-traditional industrial hubs, finding long-term positive impacts on local employment and industrial activity. Mitrunen (2021) studied Finland's post-WWII reparations to the Soviet Union, which forced a rapid shift into complex metalworking industries, resulting in sustained industrial growth in targeted municipalities.

What can we learn from this new evidence for industrial policy in Europe's semiconductor industry? In many areas, the European semiconductor industry is not leading technologically and is too small. Ensuring that globally leading companies invest in Europe helps the local industry learn from the best and scale up. This also applies to research and development, which benefits from access to advanced technologies and newly acquired process knowledge and, in turn, contributes these insights across the entire value chain. Additionally, more people will be trained in this increasingly important industry, helping drive structural change.

Conclusion

Industrial policy is as widespread as it is controversial. In the context of the European semiconductor industry and subsidies like the one for TSMC's settlement in Dresden, critics argue that this support is inefficient and ineffective in securing access to much-needed semiconductors. Inefficient, it is argued, because the goal to become resilient against potential supply shortages could be achieved at lower cost by importing semiconductors from a variety of different regions abroad. Ineffective, because of the shortage of skilled workers, which means that subsidised

new settlements will compete with local companies, leading them to poach each other's talent. What this criticism misses is that the support of local production brings technological spillovers from foreign direct investment as well as knowledge from the learning-by-doing expertise of the market leaders, benefiting the local value chain and the region as a whole. Moreover, the shortage of skilled workers is, to some extent, endogenous. "Silicon Saxony" is home to renowned universities and vocational schools that attract and educate many students. Yet many graduates leave the region because other regions offer more attractive jobs. With better job opportunities, these skilled workers can be retained in the region or move up from local less productive firms.

Overall, the case for industrial policy in the European semiconductor industry seems compelling. But it is crucial that it is carefully designed. Effective industrial policy should be forward-looking, allowing for the phasing out of unsuccessful projects. This would help ensure that resources are allocated efficiently, supporting sustainable growth and technological advancement while avoiding common policy missteps. It would be naïve to assume that industrial policy decisions are immune to political interests and influences. Yet, it would be equally misguided to expect that policymakers will refrain from interfering and that firms by themselves will internalise all the externalities and coordination failures that arise in these industries. The conclusion thus has to be that political economy constraints need to be taken into account when designing the appropriate policies, with a focus on sunset clauses that avoid continued investment in projects that do not prove to be worthwhile. There are valuable examples from which lessons can be learned.

References

- Bartik, T. J. (2020). Using place-based jobs policies to help distressed communities. *Journal of Economic Perspectives*, 34(3), 99–127.
- Boston Consulting Group. (2024). *Emerging Resilience in the Semiconductor Supply Chain* [Technical Report].
- Garin, A., & Rothbaum, J. L. (2024). The Long-Run Impacts of Public Industrial Investment on Local Development and Economic Mobility: Evidence from World War II. *NBER Working Paper Series*, w32265. National Bureau of Economic Research.
- Goldberg, P. K., Juhász, R., Lane, N. J., Forte, G. L., & Thurk, J. (2024). Industrial Policy in the Global Semiconductor Sector. *NBER Working Paper Series*, w32651. National Bureau of Economic Research.
- Gross, D. P., & Sampat, B. N. (2023). America, jump-started: World War II R&D and the takeoff of the US innovation system. *American Economic Review*, 113(12), 3323–3356.
- Hanlon, W. W. (2020). The persistent effect of temporary input cost advantages in shipbuilding, 1850 to 1911. *Journal of the European Economic Association*, 18(6), 3173–3209.
- ifo Institut. (2023). *Material Shortages Ease in German Manufacturing* [Press release].
- Irwin, D. A., & Klenow, P. J. (1994). Learning-by-doing spillovers in the semiconductor industry. *Journal of political Economy*, 102(6), 1200–1227.
- Juhász, R. (2018). Temporary protection and technology adoption: Evidence from the napoleonic blockade. *American Economic Review*, 108(11), 3339–3376.
- Juhász, R., & Lane, N. J. (2024). The Political Economy of Industrial Policy. *NBER Working Paper Series*, w32507. National Bureau of Economic Research.
- Juhász, R., Lane, N., & Rodrik, D. (2023). The new economics of industrial policy. *Annual Review of Economics*, 16.
- Kantor, S., & Whalley, A. T. (2023). Moonshot: Public R&D and growth. *NBER Working Paper Series*, w31471. National Bureau of Economic Research.
- Lane, N. (2022). *Manufacturing revolutions: Industrial policy and industrialization in South Korea*, SSRN 3890311.
- McKinsey. (2022). *Semiconductor shortage: How the automotive industry can succeed* [White paper].
- Miller, C. (2024). Global chip war for strategic semiconductors. *Nature Reviews Electrical Engineering*, 1(1), 2–3.
- Mitrunen, M. (2021). *Industrial policy, structural change and intergenerational mobility: evidence from the Finnish war reparations*. Unpublished manuscript.
- Rodrik, D. (2022). *An industrial policy for good jobs*. Hamilton Project – Policy proposal. Brookings Institution.
- Verband der Automobilindustrie. (2023). *Voraussetzungen für künftige Relevanz, Kompetenz und Resilienz für Europa* [White Paper].

André Wolf

Framework Conditions for Net-Zero Industry Clusters in Europe

With the Net-Zero Industry Act (NZIA) being approved and a set of innovation initiatives under way, the EU has finally taken an industrial perspective on its ambitious decarbonisation goals (European Union, 2024). It is based on the insight that the green transformation of industry is not limited to an exchange of energy sources but involves entirely new supply chains for climate-friendly technologies. On many global markets for key net-zero technologies like batteries and solar cells, European manufacturers play only a minor role in terms of both market share and innovative strength (European Commission, 2023). Without enhancing competitiveness in these new key industrial segments, the European growth model is at risk of persistent external dependencies and being reduced to occupying a place on the technological periphery.

The option provided by the NZIA of introducing special public support schemes for future regional centres of production, so-called net-zero acceleration valleys, could trigger a catch-up process. However, successful industry clusters are not created on a drawing board. In addition to politically controllable factors, such as infrastructure quality, their existence depends on agglomeration advantages arising from the co-location decisions of related industries. Sustainable growth results from the interplay of these factors. Successful cluster policies require policymakers to stimulate this interplay through targeted instruments that support regional networking and address existing bottlenecks.

So far, little attention has been paid to the potential characteristics and locations of future net-zero industry clusters in Europe. This article sheds light on the spatial nature of the competitiveness issue by providing a systematic overview of relevant location factors and their spatial distribution in Europe.

Cluster economics

Spatial clustering of production activities offers a range of benefits like local access to specialised input suppliers, a large labour market pool and enhanced exchange of tacit

© The Author(s) 2024. Open Access: This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>).

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

André Wolf, Centre for European Policy, Berlin, Germany.

knowledge (Henderson, 1997). Despite these well-known economic advantages, there are limits to agglomeration incentives. The limits stem from, firstly, the increased cost of immovable assets, such as land, caused by high demand in agglomeration regions. Secondly, the nature of agglomeration advantages as externalities harbours the danger of free riding. Individual companies might seek to profit from local knowledge networks while trying to prevent the outflow of their own exclusive knowledge (Wolman & Hincapie, 2015). As a result, the level of industrial agglomeration may be insufficient from a welfare perspective.

Against this background, the theory and practice of policy-induced industrial clustering has enjoyed great popularity in Europe for some time. Its founding father Michael Porter sees regional clustering as a condition for exploiting national competitive advantages (Porter, 2011). This school stresses the active roles of location policies and collaboration between local networks in shaping and maintaining successful clusters (Hospers & Beugelsdijk, 2002).

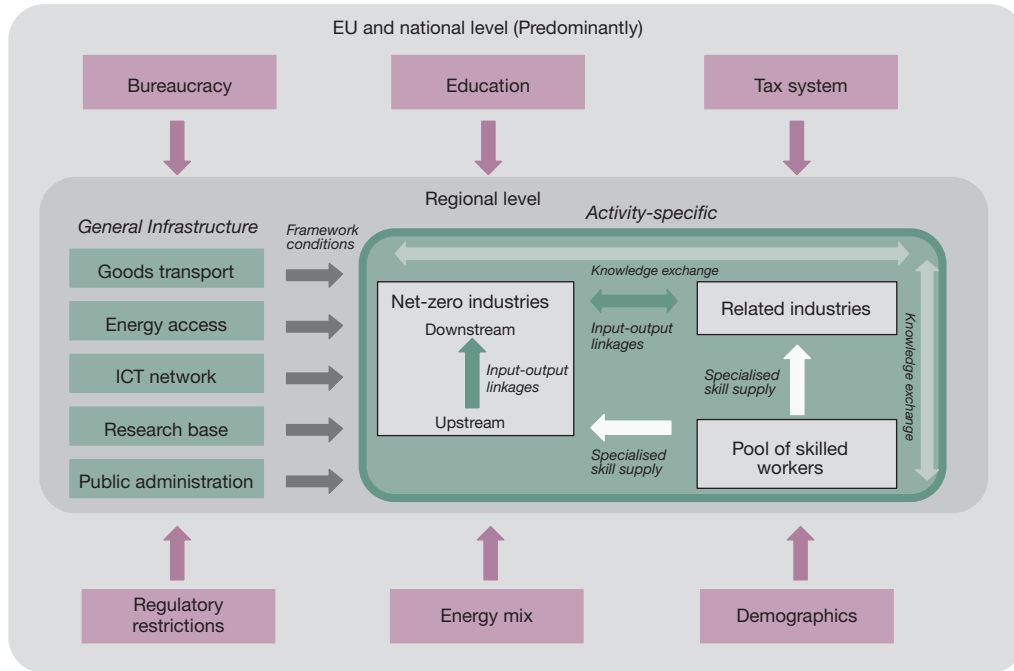
Nowadays, cluster strategies are omnipresent in regional policymaking across Europe. This involves decisions on support measures to maintain and further develop existing clusters. In theory, with perfect information and policymakers intent on maximising social welfare, regional competition would lead to an optimal spatial distribution of clusters. Under these conditions, policymakers would align the level of public cluster support with the extent of positive agglomeration externalities expected (Neumark & Simpson, 2015). In practice, the nature and limitations of externalities (and their regional disparity) are largely unknown. An uncoordinated subsidy competition between regions thus threatens to cause not only a waste of resources but also socially suboptimal spatial agglomeration patterns.

Empirical evidence (Engel et al., 2013; Falck et al., 2010; Graf & Broekel, 2020; Lehmann & Menter, 2018) stresses that the evaluation of cluster policies requires careful scrutiny of the local circumstances and the adequacy of support measures chosen. The uniqueness of the local economic structure, e.g. its business tradition and the specific skills of its workforce, must be respected by any cluster strategy.

Environment for net-zero technology clusters

The variety of technologies currently viewed as “strategic” for implementing the green transformation complicates the identification of relevant location factors. Nevertheless,

Figure 1
System of fundamental location factors for net-zero industry valleys



Source: Author's own illustration.

certain commonalities can be highlighted. Most net-zero technologies are only at an early stage of their life cycle. There is the prospect of significant future cost reductions as a result of scaling and technological improvements. This requires continuous optimisation of supply chains, which is facilitated by stable relationships with regional input suppliers. Moreover, the novelty of the technologies places specific demands on the qualifications of the workforce, requiring a large regional pool of specialised labour. A dense local network of related industries could therefore represent an important locational advantage.

In addition, the high knowledge intensity of net-zero technologies creates the need for a high-quality regional research infrastructure. The literature shows that the presence of research-intensive universities and research institutes in regional clusters can increase general innovation activity and boost R&D productivity (Hewitt-Dundas, 2013). They serve as a nucleus for new entrepreneurial activity to market regional innovations (Carree et al., 2014).

Local energy supply is likewise critical for net-zero technologies. Their net-zero status hinges on sufficient access to renewable energy sources. Currently, delays in the expansion of electricity grids are inhibiting the European integration of electricity markets (Pietzcker et al., 2021). The local generation potential of electricity from re-

newables could therefore become a limiting factor for the emergence of net-zero technology clusters.

In addition, location factors with general relevance for high-tech manufacturers matter as well. One of these is IT connectivity, due to the need for continuous information exchange within factories and along supply chains (First-Light, 2024). Moreover, the existence of a well-developed regional transport infrastructure (roads, railways, harbors, flight connections) is important for reducing trade costs. Finally, the quality of local public administration services (speed, reliability) affects the speed of approval procedures and the business-friendly implementation of national and EU-wide laws. Figure 1 summarises the factors discussed in a multi-level system. In what follows, we attempt to assess these factors for EU regions.

Public infrastructure quality in EU regions

The location factors that determine a region's general infrastructure quality are measured first. Where possible, we rely on Eurostat as a reliable database (Eurostat, 2024), supplemented by other public sources. As a territorial unit, we choose the NUTS 2 level for reasons of data availability.

Table 1 shows the selected indicators for each infrastructure category. For the "goods transport" category, we uti-

Table 1
Overview on infrastructure indicators

Category	Indicator	Meaning	Source
Transport	Density of motorways	Average density of motorways (km per km ² area) in the region and neighbouring regions in 2021	Eurostat (2024)
	Density of railways	Average density of railways (km per km ² area) in the region and neighbouring regions in 2021	Eurostat (2024)
	Daily flight passengers	Average number of daily flight passengers in 2022	Eurostat (2024)
ICT	Broadband access households	Share of private households with access to broadband internet in 2021	Eurostat (2024)
	Broadband access enterprises	Share of enterprises with access to broadband internet in 2021	European Union (2022)
	High-speed internet	Share of population with high-speed internet connection in 2021	European Union (2022)
Research base	Human resources in science and technology	Number of employees in science and technology per capita in 2023	Eurostat (2024)
	Public R&D expenditure	Public expenditure for research and development per capita in 2022	European Union (2023)
	Scientific publications	Number of publications in international scientific journals by researchers in the region per capita in 2023	European Union (2023)
Public administration	Prevention of corruption	Prevention of corruption in regional public administration according to a survey-based index in 2024	Charron et al. (2024)
	Quality and accountability	Quality and accountability of regional public administration according to a survey-based index in 2024	Charron et al. (2024)
	Impartiality	Impartiality of regional public administration according to a survey-based index in 2024	Charron et al. (2024)

Source: Author's own representation.

lise Eurostat data on the density of transport networks. The quality of ICT networks is reflected by indicators from the EU Regional Competitiveness Index (European Union, 2022). To map the research base, we draw on data from the EU Regional Innovation Scoreboard (European Union, 2023). For the quality of regional public administration, we rely on the results of regular surveys for the European Quality of Government Index (EQI) (Charron et al., 2024). Energy access represents a special case in view of the energy transition. Due to the uncertainty concerning future local supply conditions, we do not integrate it in our index, but consider the local potential of electricity generation from renewables as a separate limiting factor. For this, we draw on estimates by Kakoulaki et al. (2021).

The individual indicators are aggregated in weighted form into the respective categories. Following a procedure common in the literature, we determine the weighting on the basis of a (category-specific) Principal Component Analysis (PCA). The indicators are included in the PCA in standardised format. In each case, we select the loadings of the first factor as the basis for the weighting. This results in four infrastructure indices.

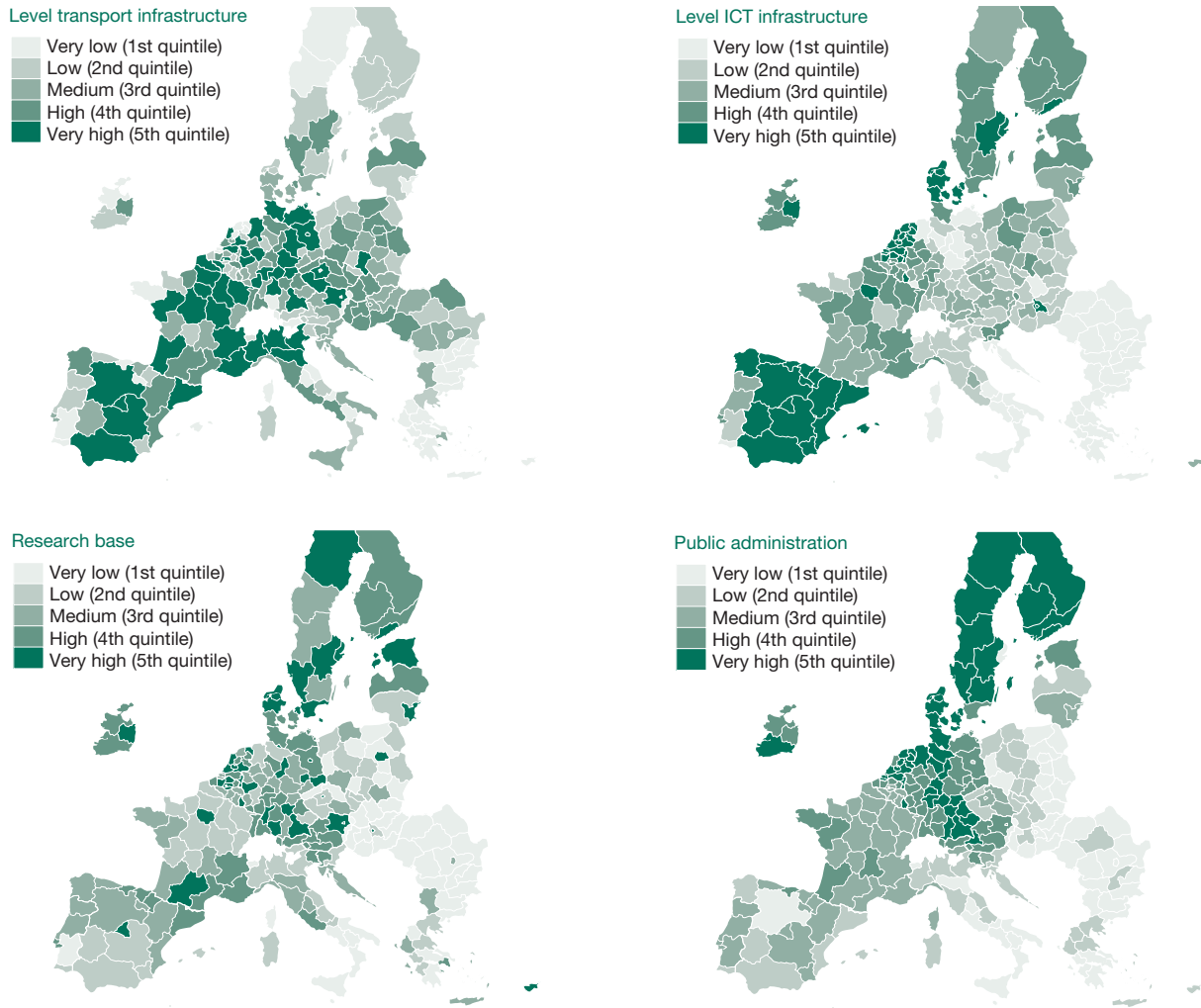
The resulting regional distributions of the index scores are illustrated in Figure 2 as quintiles. Apart from a general west-east divide, it reveals a nuanced pattern. While the transport infrastructure is rated as particularly good in economic core regions, there is little correlation to ex-

isting agglomeration patterns in the other infrastructure dimensions. Regarding ICT quality, country differences are particularly striking. Spain, Denmark and the Benelux countries achieve high coverage with broadband access nationwide. In contrast, the industrial regions of Germany and Italy only achieve below-average values in some cases. In the area of administrative quality, the Scandinavian countries are almost universally found among the top 20%. A large part of the Benelux region and parts of Germany are also among the top performing regions. The assessment of the research base, on the other hand, points strongly to regional centres within the member states.

To obtain an aggregate measure of infrastructure quality, different kinds of weighting and aggregation processes are conceivable. Companies from different net-zero industries will differ in the specific weight they place on certain infrastructure categories. Yet, it is generally plausible that the different categories are not considered perfect substitutes, given the distinct kinds of infrastructure services they provide. We reflect this idea through a multiplicative aggregation (geometric average) of the values in the four infrastructure sub-indices.

The resulting top 10 regions are shown in Table 2. These regions are concentrated on four member states: Germany, France, Denmark and the Netherlands. These regions share above-average performance in almost all categories. Some, but not all, of them are already important

Figure 2
Results of infrastructure sub-indices in EU regions



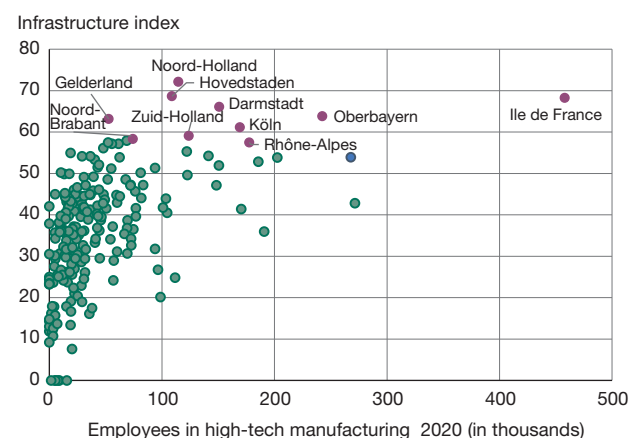
Source: Author's own calculations.

Table 2
Top ten EU NUTS 2 regions in infrastructure quality (index values)

Rank	NUTS	Region	Transport infrastructure	ICT infrastructure	Public administration	Research base	Total (geom. av.)
1	NL32	Noord-Holland	64.18	99.34	69.05	61.54	72.14
2	DK01	Hovedstaden	32.43	86.30	79.35	100.00	68.65
3	FR10	Ile de France	100.00	85.32	48.72	52.22	68.26
4	DE71	Darmstadt	93.02	69.00	71.35	41.65	66.08
5	DE21	Oberbayern	68.64	54.75	72.00	61.29	63.81
6	NL22	Gelderland	41.99	96.37	78.16	50.30	63.16
7	DEA2	Köln	58.81	63.08	65.33	57.60	61.13
8	NL33	Zuid-Holland	31.82	98.75	72.97	53.16	59.09
9	NL41	Noord-Brabant	41.46	96.13	71.65	40.53	58.33
10	FRK2	Rhône-Alpes	78.75	64.74	57.80	37.03	57.47

Source: Author's own calculations; Index values standardised from 0 (lowest value) to 100 (highest value).

Figure 3
Comparison of infrastructure quality and high-tech manufacturing in EU regions



Source: Eurostat (2024); author's own calculations.

centres for high-tech production throughout Europe (see Figure 3). Conversely, however, not all the important high-tech locations exhibit above-average infrastructure quality. Counterexamples include Lombardia (ITC4) and Lazio (ITI4), which are only in the midfield.

Local industry linkages in EU regions

Measuring the extent of regional industry linkages is a difficult task, due to the diversity of input requirements of dif-

ferent net-zero technologies. Moreover, European sectoral statistics do not allow for a clear delineation of economic activities identifiable as net-zero. We have therefore chosen an alternative indirect approach for our analysis based on the use of US data. The regional datasets regularly published by the U.S. Bureau of Economic Analysis (BEA) are characterised by a much finer granularity than European sources such as Eurostat. We apply the methodology used by Delgado et al. (2016) to identify clusters of technologically closely related industries. It is based on the calculation of multidimensional similarity matrices to evaluate the pairwise similarity of industries. Based on these matrices, individual industries are grouped into disjointed clusters using established methods of cluster analysis.

The first step is to identify the sectors of the North American Industry Classification (NAICS) containing net-zero technologies. The 2017 version of the NAICS comprises a total of 1,057 different industries (so-called national industries). Our classification of these national industries as net-zero technologies is based on a comparison of the content descriptions found in NAICS documentation with the list of specifically named net-zero technologies from the NZIA (European Union, 2024). On this basis, we identify a total of nine NAICS industries that clearly involve production of net-zero technologies, either in total or in part. They are henceforth termed “NZZ industries”.

Table 3 shows the list of industries and their relevance for specific items on the NZIA list. Since other NAICS indus-

Table 3
Identified net-zero technology industries in the North American Industry Classification

NAICS Code	Title	Example(s) of relevant products	Relevant item(s) on NZIA list
333415	Heating equipment (except warm air furnaces) manufacturing	Heat pumps	Heat pumps and geothermal energy technologies
333611	Turbine and turbine generator set units manufacturing	Wind turbines	Onshore wind and offshore renewable technologies
333912	Air and gas compressor manufacturing	CO ₂ compressor for carbon capture and storage; compressors for transport of hydrogen or biogas	Carbon capture and storage technologies; hydrogen technologies; sustainable biogas and biomethane technologies; CO ₂ transport and utilisation technologies
333994	Industrial process furnace and oven manufacturing	Low-emission metal melting (e.g. hydrogen-, biogas-based crude steel production)	Hydrogen technologies; sustainable biogas and biomethane technologies
334413	Semiconductor and related device manufacturing	Photovoltaic cells, -modules; fuel cells	Solar technologies; hydrogen technologies
334515	Instrument manufacturing for measuring and testing electricity	Power measuring equipment	Electricity grid technologies
335311	Power, distribution and specialty transformer manufacturing	Power transformers (voltage regulators)	Electricity grid technologies
335911	Storage battery manufacturing	Batteries for electric cars / large-scale energy storage	Battery and energy storage technologies
335929	Other communication and energy wire manufacturing	Electrical cables	Electricity grid technologies

Source: Author's own representation.

Table 4
Results of cluster analysis

NAICS code	NAICS title	NACE equiv. (code)	NACE equiv. (title)
Technology Cluster 1			
3321	Fabricated metal product manufacturing	C25	Manufacture of fabricated metal products
3331	Machinery manufacturing (other than NZT industries)	C28	Manufacture of machinery and equipment n.e.c
333415	Heating equipment (except warm air furnaces) manufacturing	C28	Manufacture of machinery and equipment n.e.c
333611	Turbine and turbine generator set units manufacturing	C28	Manufacture of machinery and equipment n.e.c
333912	Air and gas compressor manufacturing	C28	Manufacture of machinery and equipment n.e.c
333994	Industrial process furnace and oven manufacturing	C28	Manufacture of machinery and equipment n.e.c
3366	Ship and boat building	C30	Manufacture of other transport equipment
3369	Other transport equipment	C30	Manufacture of other transport equipment
3371	Furniture manufacturing	C31	Manufacture of furniture
3391	Medical equipment and supplies manufacturing	C32	Other manufacturing
3399	Miscellaneous	C32	Other manufacturing
Technology Cluster 2			
334413	Semiconductor and related device manufacturing	C26	Manufacture of computer, electronic and optical products
3351	Electric lighting equipment manufacturing	C27	Manufacture of electrical equipment
335311	Power, distribution, and specialty transformer manufacturing	C27	Manufacture of electrical equipment
3353	Electrical equipment manufacturing (other than NZT industries)	C27	Manufacture of electrical equipment
335911	Storage battery manufacturing	C27	Manufacture of electrical equipment
3359	Other electrical equipment and component manufacturing (other than NZT industries)	C27	Manufacture of electrical equipment
335929	Other communication and energy wire manufacturing	C27	Manufacture of electrical equipment
Technology Cluster 3			
3341	Computer and peripheral equipment manufacturing	C26	Manufacture of computer, electronic and optical products
334515	Instrument manufacturing for measuring and testing electricity	C26	Manufacture of computer, electronic and optical products
3346	Manufacturing and reproducing magnetic and optical media	C26	Manufacture of computer, electronic and optical products
3364	Aerospace product and parts manufacturing	C30	Manufacture of other transport equipment

Source: Author's own calculations. Net-zero technology (NZT) industries are highlighted in green.

tries may also contain relevant components, and the set of net-zero industry technologies is constantly evolving, it should be understood as a minimum core list.

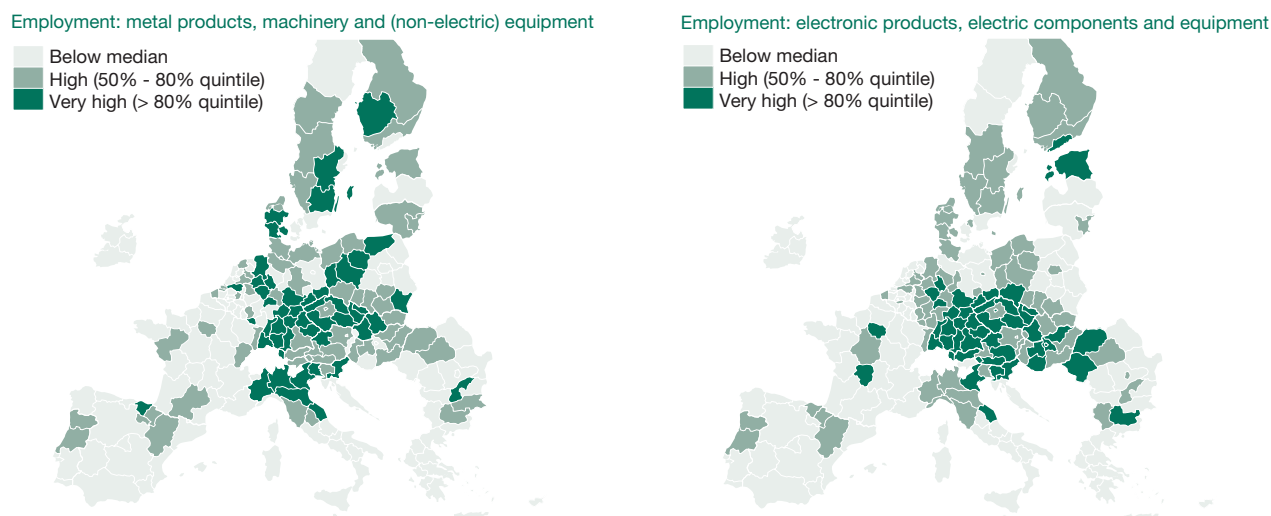
To measure the degree of similarity between industries with regard to supply chain linkages, we use the current version of the BEA's national input-output tables (BEA, 2024). We measure the degree of input-related similarity between two industries as a correlation coefficient of value shares of purchased inputs. Likewise, we calculate the output-related similarity as the correlation of value shares of customer industries. Finally, we compute the degree of similarity in labour demand on the basis of data from the Bureau of Labor Statistics (BLS). It shows the number of employees by occupational group in NAICS industries (BLS, 2024). We calculate the correlation between the employment distributions of the different industries.

We then performed k-means cluster analyses for the three individual similarity measures to identify clusters among industries.¹ Sectors that were part of the same clusters as the NZT industries in all three dimensions were considered linked industries. Table 4 summarises the resulting clusters of linked industries. The NZT industries covered are spread over a total of three clusters.

Clusters 1 and 2 are particularly interesting, as they contain various net-zero technologies. To apply our results to the European level, we carry out a mapping of the NAICS industries included in these two clusters to the coarser two-digit level of the EU NACE classification (see last column in Table 4), using the concordance table between

¹ For each similarity measure, the optimal number of clusters was chosen based on the silhouette method.

Figure 4
Employment density of identified industry groups in EU NUTS 2 regions (2020)



Source: Eurostat (2024); author's own calculations.

NAICS and ISIC provided by the BEA and the ISIC-NACE concordance provided by Eurostat. This results in an industry group 1 comprising “metal products, machinery and (non-electric) equipment” and an industry group 2 comprising “electronic products, electric components and equipment”.

Figure 4 illustrates the distribution of employment intensities in these industry groups as the number of regional employees per capita in 2020. The spatial patterns show a strong similarity, which reflects the important role of inter-industry agglomeration effects and general regional location factors. Large cross-regional bands of intensive industrial activity in the centre of Europe are contrasted with individual local hotspots at the periphery. Regarding the “metal products, machinery and (non-electric) equipment” group, the south and northwest of Germany, northern Italy/southeastern France, the north of Poland and the Czech Republic/Slovakia/Hungary form large cross-regional production centres. In the “electronic products, electric components and equipment” segment, there is an even stronger concentration on Central Europe overall. Parts of Romania and Estonia are important hubs in the east, as is central France in the west.

Summary assessment of EU regions

A comparison of the previous analyses allows for a tentative identification of high-potential regions. If, as the agglomeration literature suggests, general infrastructure quality and the benefits of industry-specific agglomeration jointly determine the attractiveness of a location,

regions that stand out in both areas are “natural candidates” for hosting net-zero industry valleys. Table 5 lists such regions for the two industry groups considered. The first column lists regions with exceptionally high (> 80% quintile) values both in relation to infrastructure quality and employment density of the respective industry groups (“excellent conditions”). For both industry groups, this includes several regions in southern Germany. Scandinavian regions are also represented. The second and the third column includes regions that only achieve exceptionally high values in one of the two measures, and fairly high values (50% < x < 80%) in the other (“good conditions”). This segment includes various regions in Austria and Italy. The highly industrialised regions in Eastern Europe are hardly represented in this segment, as a result of their mostly low infrastructure scores.

A potential limiting factor is energy supply. As argued above, sufficient access to electricity from renewable sources can become crucial for the expansion of production capacities for net-zero technologies. When comparing estimates by Kakoulaki et al. (2021), regions identified as offering excellent or good framework conditions exhibit on average a significantly smaller generation potential for electricity from renewables than the remaining NUTS 2 regions (see Figure 5). This mainly results from the fact that cluster candidates are largely located far away from seacoasts, which are best suited for wind power. Future production centres for net-zero technologies could therefore depend heavily on the inflow of renewable energy from other regions, putting further pressure on grid expansion.

Table 5
Net-zero technology cluster candidates by industry group

Industry group 1: Metal products, machinery and (non-electric) equipment					
Excellent conditions Very good infrastructure, very high employment density			Good conditions Good infrastructure, very high employment density		
NUTS	Region name	NUTS	Region name	NUTS	Region name
DE11	Stuttgart	AT31	Oberösterreich	DEA1	Düsseldorf
DE12	Karlsruhe	CZ06	Jihovýchod	DK05	Nordjylland
DE25	Mittelfranken	DE13	Freiburg	FR10	Ile de France
DE26	Unterfranken	DE14	Tübingen	FRJ2	Midi-Pyrénées
DEA5	Arnsberg	DE23	Oberpfalz	NL41	Noord-Brabant
DK03	Syddanmark	DE24	Oberfranken		
DK04	Midtjylland	DE27	Schwaben		
SE12	Östra Mellansverige	DE72	Gießen		
		DE94	Weser-Ems		
		DED2	Dresden		
		DEG0	Thüringen		
		ES21	País Vasco		
		FI19	Länsi-Suomi		
		ITC1	Piemonte		
		ITC4	Lombardia		
		SE21	Småland med öarna		
Industry group 2: Electronic products, electric components and equipment					
Excellent conditions Very good infrastructure, very high employment density			Good conditions Good infrastructure, very high employment density		
NUTS	Region name	NUTS	Region name	NUTS	Region name
CZ01	Praha	AT21	Kärnten	DE30	Berlin
DE11	Stuttgart	AT22	Steiermark	DE71	Darmstadt
DE12	Karlsruhe	AT31	Oberösterreich	DE91	Braunschweig
DE21	Oberbayern	AT33	Tirol	DEA2	Köln
DE25	Mittelfranken	CZ02	Střední Čechy	FI1D	Pohjois- ja Itä-Suomi
DE26	Unterfranken	CZ06	Jihovýchod		
DEA5	Arnsberg	DE13	Freiburg		
FI1B	Helsinki-Uusimaa	DE14	Tübingen		
FR10	Ile de France	DE24	Oberfranken		
		DE27	Schwaben		
		DE72	Gießen		
		DED2	Dresden		
		DEG0	Thüringen		
		EE00	Eesti		
		HU11	Budapest		
		SI04	Zahodna Slovenija		

Source: Author's own calculations.

Discussion

In principle, the new Net-Zero Acceleration Valleys present a welcome opportunity for member states to develop regions with good starting conditions into future production

hubs. A dedicated policy strategy can support the development of such clusters. It helps to overcome coordination problems in the location decisions of the newly forming industries and thus facilitates the exploitation of agglomeration externalities. However, an uncoordinated subsidy

Figure 5
Average annual green electricity potential by region type



Source: Kakoulaki et al. (2021); author's own calculations.

competition between European regions must be avoided. It would cannibalise scarce public resources and provoke an inefficient spatial allocation of production capacities across Europe. The EU as a whole will only be successful in gaining competitiveness if the distribution of clusters reflects the true comparative advantages of the regions.

Coordination and cooperation at the European level are essential for such an intelligent specialisation. The Net-Zero Europe Platform introduced by the Net-Zero Industry Act (European Union, 2024) should be developed into a governance institution. Its central tasks should be the coordination of the planning of Net-Zero Acceleration Valleys by the member states and the monitoring of their development. The support provided by EU regional and cohesion policies should be channelled to strengthen the infrastructure in future Net-Zero Acceleration Valleys. Regarding promotion at the member state level, clear guidelines should be set across the EU to avoid a proliferation of different subsidy schemes. Existing administrative bottlenecks in the regions should also be tackled with EU support. Moreover, to support private demand, the option of a temporary coverage of price gaps between domestic and global production should be explored, with Carbon Contracts for Difference as a potential role model.

Finally, a relevant issue for public acceptance is the long-term impact of cluster policies on spatial economic inequality in Europe. The latest election results in Europe suggest that the distributional effects of transformative policies are contributing to a dangerous strengthening of political extremes. Against this background, it is crucial for policymakers to stress that an intelligent specialisation strategy does not aim to deindustrialise regions outside

dedicated clusters. This requires the development of net-zero industry clusters to be embedded in an overarching smart specialisation strategy of Europe's regions. It should build on a European vision of competitive supply chains in a future global trade order. If such a strategy is implemented wisely, net-zero industry clusters can become drivers for Europe's industrial renaissance.

References

- BEA. (2024). *Input-Output-Accounts Data*. US Department of Commerce – Bureau of Economic Analysis. <https://www.bea.gov/industry/input-output-accounts-data>
- BLS. (2024). *Occupational and Employment Wage Statistics*. US Bureau of Labor Statistics. <https://www.bls.gov/oes/tables.htm>
- Carree, M., Malva, A. D., & Santarelli, E. (2014). The contribution of universities to growth: Empirical evidence for Italy. *The Journal of Technology Transfer*, 39(3), 393–414.
- Charron, N., Lapuente, V., & Bauhr, M. (2024). *The Geography of Quality of Government in Europe. Subnational variations in the 2024 European Quality of Government Index and Comparisons with Previous Rounds*.
- Delgado, M., Porter, M. E., & Stern, S. (2016). Defining clusters of related industries. *Journal of Economic Geography*, 16(1), 1–38.
- Engel, D., Mitze, T., Patuelli, R., & Reinkowski, J. (2013). Does cluster policy trigger R&D activity? Evidence from German biotech contests. *European Planning Studies*, 21(11), 1735–1759.
- European Commission. (2023). Investment needs assessment and funding availabilities to strengthen EU's Net-Zero technology manufacturing capacity. *Commission Staff Working Document*, SWD(2023) 68.
- European Union. (2022). *EU Regional Competitiveness Index – Edition 2022*. https://ec.europa.eu/regional_policy/information-sources/maps/regional-competitiveness_en
- European Union. (2023). *Regional Innovation Scoreboard*. https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/regional-innovation-scoreboard_en
- Eurostat. (2024). *Regional statistics by NUTS classification*. Eurostat Database. <https://ec.europa.eu/eurostat/web/regions/database>
- Falck, O., Heblich, S., & Kipar, S. (2010). Industrial innovation: Direct evidence from a cluster-oriented policy. *Regional Science and Urban Economics*, 40(6), 574–582.
- FirstLight. (2024). *5 Reasons Connectivity Is Vital to High-Tech Manufacturers*. <https://www.firstlight.net/5-reasons-connectivity-is-vital-to-high-tech-manufacturers/>
- Graf, H., & Broekel, T. (2020). A shot in the dark? Policy influence on cluster networks. *Research Policy*, 49(3), 103920.
- Henderson, V. (1997). Externalities and industrial development. *Journal of Urban Economics*, 42(3), 449–470.
- Hewitt-Dundas, N. (2013). The role of proximity in university-business cooperation for innovation. *The Journal of Technology Transfer*, 38(2), 93–115.
- Hospers, G. J., & Beugelsdijk, S. (2002). Regional cluster policies: learning by comparing? *Kyklos*, 55(3), 381–402.
- Kakoulaki, G., Kougiyas, I., Taylor, N., Dolci, F., Moya, J., & Jäger-Waldau, A. (2021). Green hydrogen in Europe – A regional assessment: Substituting existing production with electrolysis powered by renewables. *Energy Conversion and Management*, 228, 113649.
- Lehmann, E. E., & Menter, M. (2018). Public cluster policy and performance. *The Journal of Technology Transfer*, 43(3), 558–592.
- Neumark, D., & Simpson, H. (2015). Place-based policies. *Handbook of Regional and Urban Economics* (Vol. 5, pp. 1197–1287). Elsevier.
- Pietzcker, R. C., Osorio, S., & Rodrigues, R. (2021). Tightening EU ETS targets in line with the European Green Deal: Impacts on the decarbonization of the EU power sector. *Applied Energy*, 293, 116914.
- Porter, M. E. (2011). *Competitive advantage of nations: creating and sustaining superior performance*. Simon and Schuster.
- Wolman, H., & Hincapie, D. (2015). Clusters and cluster-based development policy. *Economic Development Quarterly*, 29(2), 135–149.

Philipp Heimberger, Lennard Welslau, Bernhard Schütz, Sebastian Gechert, Dario Guarascio and Francesco Zezza*

Debt Sustainability Analysis in Reformed EU Fiscal Rules

The Effect of Fiscal Consolidation on Growth and Public Debt Ratios

Debt Sustainability Analysis (DSA) relies on macroeconomic and fiscal policy assumptions; it plays an essential role in providing an anchor for bilateral negotiations and surveillance in the context of reformed EU fiscal rules. While the European Commission assumes a constant short-run fiscal multiplier of 0.75, the literature highlights that there is no single fiscal multiplier for all countries and all times. Furthermore, the European Commission's DSA framework assumes a fast dissipation of the output effect of fiscal adjustment, and that fiscal consolidation efforts by trading partners do not spill over into domestic economic activity. This article presents DSA simulations that relax the official assumptions by focusing on the four largest euro area economies: Germany, France, Italy and Spain. The results suggest that the debt sustainability framework in reformed EU fiscal rules is sensitive to changes in assumptions and may underestimate the negative growth effects of fiscal adjustment. Hence, public debt ratios may turn out higher than expected.

Debt Sustainability Analysis (DSA) plays a key role in reformed EU fiscal rules, which came into force on 30 April 2024. For EU member countries with a fiscal deficit above 3% of GDP or a public debt ratio above 60%, the European

Commission (EC) put forward a DSA-based “reference trajectory”. This is supposed to ensure that, by the end of a multi-year fiscal adjustment period, the public debt ratio “is on a plausibly downward trajectory or stays at prudent levels, even under adverse scenarios” (Regulation (EU) 2024/1263).

Philipp Heimberger, Vienna Institute for International Economic Studies, Austria; and Forum for Macroeconomics and Macroeconomic Policies (FMM).

Lennard Welslau, University of Copenhagen; and Danmarks Nationalbank, Denmark.

Bernhard Schütz, Vienna Institute for International Economic Studies, Austria; and University of Duisburg-Essen, Germany.

Sebastian Gechert, Chemnitz University of Technology, Germany; and Forum for Macroeconomics and Macroeconomic Policies (FMM).

Dario Guarascio, Sapienza University of Rome, Italy.

Francesco Zezza, Sapienza University of Rome, Italy; and Levy Economics Institute, USA.

This paper provides a quantitative assessment of the assumptions underlying the current DSA in reformed EU fiscal rules (EC, 2024a).¹ We show how the introduction of different assumptions concerning the impact of fiscal consolidation on economic growth may lead to different outcomes. The fiscal multiplier is a key concept to understand how changes in the fiscal stance may amplify or dampen economic activity (e.g. Batini et al., 2014; Gechert

¹ For an early assessment of assumptions underlying the DSA, see Annex 4 in Darvas et al. (2023). Paetz and Watzka (2024) assess changes to the DSA assumptions on ageing costs and interest rates.

© The Author(s) 2024. Open Access: This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>).

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

* The study benefited from funding provided by Open Philanthropy in the context of the European Macro Policy Network coordinated by Dezernat Zukunft.

et al., 2016; Ramey, 2019). We analyse how changes to the fiscal multiplier assumption in the current DSA framework affect economic outcomes in terms of inflation-adjusted GDP and public debt ratios. Furthermore, we highlight the importance of assumptions on how fast the negative short-run growth effects of fiscal adjustment dissipate and whether simultaneous fiscal adjustments in other EU countries magnify the domestic growth impact (e.g. in 't Veld, 2013; Goujard, 2017). When we deviate from the EC's baseline adjustment scenario by using plausible assumptions on the growth impact of fiscal adjustment based on the existing literature, growth rates turn out lower and public debt-to-GDP ratios develop more unfavourably.

The next section introduces the DSA framework and discusses the key assumptions of how fiscal consolidation affects growth and public debt ratios against the background of the relevant academic literature. This is followed by different scenarios of how changes to the key assumptions affect DSA outcomes in the four largest euro area economies (Germany, France, Italy and Spain).

Key assumptions of the DSA framework in reformed EU fiscal rules

The EC has been applying DSA for years to contribute to the monitoring and surveillance of fiscal policy under the Stability and Growth Pact to help inform country-specific recommendations in the European Semester and to support surveillance after adjustment programmes (EC, p. 36). However, DSA strongly gains importance with its new role of providing an anchor for bilateral negotiations and surveillance due to the reform of EU fiscal rules (Darvas et al., 2023; Heimberger, 2023).

Debt sustainability is a complex and contested concept. The literature does not provide a universally accepted definition (e.g. Wyplasz, 2011; Guzman, 2016). According to reformed EU fiscal rules, debt sustainability is ensured when the public debt ratio is on a plausibly downward trajectory even under adverse assumptions. To operationalise this, the EC applies a baseline scenario, three deterministic stress tests – one in which the structural balance deteriorates compared to the adjustment baseline, one in which the interest-growth differential worsens, and one in which market interest rates increase temporarily – and stochastic analysis, where the stochastic part is used to estimate the probability of a decline in the public debt ratio in the five years after the adjustment period.²

² The debt concept used refers to gross consolidated general government debt. This includes financial liabilities related to currency, deposits, debt securities and loans. Assets owned by the government vis-à-vis counterparts are not netted out (EC, 2022, p. 120).

The DSA-based criteria for the reference trajectories, put forward by the EC for each member state with a fiscal deficit above 3% of GDP or a public debt ratio above 60%, require that without further fiscal consolidation: the public debt ratio declines or stays below the 60% threshold by the end of the multi-year fiscal adjustment period and over the ten years after the adjustment; the public debt ratio falls with a sufficiently high probability, which is set to at least 70% (stochastic analysis); and the fiscal deficit goes below 3% and remains there over the medium term.

The legislative texts do not regulate the DSA assumptions. The application of the DSA was left to the discretion of the EC, which used its existing DSA framework based on the latest Debt Sustainability Monitor (EC, 2024a) for the first round of “reference trajectories”, submitted to member states in June 2024 but not yet published. For later rounds, a DSA working group will review the underlying methodology.

An in-depth analysis of all the assumptions in the EC's DSA framework is beyond the scope of this paper (see EC (2024a) and Darvas et al. (2023) for a detailed discussion). Beyond the multi-year fiscal adjustment period, the EC applies a no-fiscal-policy-change assumption, where the only changes considered are due to the costs of ageing as projected in the latest Ageing Report (EC, 2024b). On borrowing costs and inflation, the EC assumes convergence to financial market expectations. Regarding real GDP growth, the DSA framework relies on the latest EC forecast for the first two years and then, for the following years, it assumes that growth converges to the potential growth rate, estimated via the EC's potential output model.³ The EC framework does consider feedback effects of fiscal policy on GDP growth: if there is a fiscal adjustment in a certain year, economic growth in the same year is revised downwards by 0.75 percentage points of GDP for every one percentage point in fiscal consolidation (EC, 2024a, p. 57).

In what follows, we assess the DSA assumptions regarding the impact of fiscal consolidation on growth. In so doing, we hold all other assumptions on interest rates, inflation, etc. constant. The EC (2024a, p. 57) assumes a fiscal multiplier of 0.75, referring to a paper published in its Economic Papers series (Carnot & de Castro, 2015), which presents a new way of measuring the fiscal stance by combining a narrative approach on tax revenues with a structural balance approach on expenditures. The main results are summarised as follows:

³ For a critical discussion of the EC's potential output model, see Fatas (2019) and Heimberger et al. (2020).

[[W]e find point estimates of short-run output multipliers a bit below unity on average, of the order of 0.8-0.9, with a 95% uncertainty range of +/-0.3. Fiscal multipliers are known to depend largely on the composition of fiscal shocks and on circumstances...[W]e find... higher expenditure multipliers (of the order of 1.0 or above and up to 1.4) than revenue multipliers (around 0.5 or a bit below)... [W]e find some differentiation between good and bad times as defined by a positive (respectively negative) change in the output gap, with the average multiplier being significantly lower in the former case and the tax and spending multiplier being generally lower as well. (Carnot & de Castro, 2015, p. 4)

Yet, the EC (2024a) does not provide further justification for its DSA assumption on the fiscal multiplier. While 0.75 is a short-run average multiplier below unity, the results reported in Carnot and de Castro (2015) are more nuanced. They suggest that there is considerable uncertainty around point estimates, and that the short-run effect of a fiscal adjustment on growth may vary depending on how much of the adjustment is on the tax or expenditure side, and whether the adjustment is done when there is little or a lot of economic slack. While fiscal multiplier values reported in the literature vary considerably (e.g. Gechert, 2015; Leeper et al., 2017), the finding by Carnot and de Castro (2015) that multipliers depend on macroeconomic circumstances is broadly consistent with other papers showing that multipliers in downturns are significantly larger than in upswings, and recession multipliers can be well above unity, in particular on the spending side (e.g. Auerbach & Gorodnichenko, 2012; Caldara & Kamps, 2017; Canzeroni et al., 2016; Jorda & Taylor, 2016; Heimberger, 2017; Gechert & Rannenberg, 2018).

The degree of openness matters too, as fiscal multipliers in small open economies may be substantially lower than in large, relatively closed ones, as much of the change in fiscal policy in open economies spills over into the economic activity of trading partners (e.g. Karras, 2012; Iltetzki et al., 2013). Furthermore, the literature argues that it matters whether the central bank is constrained in using its monetary policy tools, as fiscal multipliers can be significantly above unity at the zero lower bound of nominal interest rates (e.g. Woodford, 2011; Bonam et al., 2022). More recent macroeconomic models with heterogeneous agents, bound by precautionary saving motives, find a smaller influence of the monetary policy stance on the multiplier (McKay et al., 2016), but a larger average multiplier effect, which does not peter out quickly, but is more persistent over time (Auclert et al., 2024).

How does the fiscal multiplier affect output over time in the DSA framework? To answer this question, let us as-

sume that a government starts to consolidate in 2025. In the DSA framework, the fiscal adjustment opens up a negative output gap – defined as the difference between actual and potential GDP – in the same year. The size of the output gap is determined by the size of the fiscal adjustment – measured as an improvement in the structural primary fiscal balance, in percentage points of GDP – multiplied by the constant short-run multiplier of 0.75. In the next year (2026), the EC assumes that two-thirds of the output gap from the previous year (2025) remain. The fiscal adjustment in 2026 then further increases the output gap based on the short-run fiscal multiplier. This pattern is continued until the adjustment period ends. Let us assume that this happens in 2028, i.e. after a four-year adjustment. The key assumption is that the output gap then closes within three years. For a four-year adjustment period over 2025-2028, the output gap would therefore close automatically over 2029-2031. In the first post-adjustment year (2029), the output gap falls to two-thirds of the output gap in the final consolidation year (2028); in the second post-adjustment year (2030), the output gap falls to one-third of the 2028 value; and then the gap closes completely in the third post-adjustment year (2031), i.e. actual output returns to potential output.

The EC does not justify its three-year output gap closure rule in any detail. This is particularly interesting since an earlier EC Discussion Paper (Mc Morrow et al., 2017) weighs the arguments in favour or against the then existing t+4-year closure rule (that could be extended to up to t+6 years by expert judgement in the case of a severe downturn). However, the output gap may prove stickier than assumed by the EC, i.e. it may take considerably longer to close the gap and return to potential output (e.g. DeLong & Summers, 2012; Jarocinski & Lenza, 2018; Auclert et al., 2024).

Finally, a key assumption in the DSA framework in reformed EU fiscal rules is that fiscal adjustment by a given government only affects domestic economic activity, but does not spill over to other countries, even in the presence of strong economic ties. This is an unrealistic assumption, as the EC itself has frequently emphasised the importance of accounting for how the individual fiscal stance affects the euro area aggregate as a whole (e.g. EC, 2016). No less relevant, fiscal policy spillovers were a main justification for why EU fiscal rules for all member countries were introduced in the first place (e.g. Buti & Giudice, 2002). The issue is particularly important in the EMU, as individual euro area countries cannot offset fiscal spillovers by using national monetary policy (e.g. Blanchard et al., 2021). Nonetheless, the EC currently performs the DSA separately for each country, without taking spillovers into account. However, recent empirical findings suggest

that cross-country spillovers from fiscal consolidation are sizeable, in particular in the euro area context (e.g. in 't Veld, 2013; Goujard, 2017; Alloza et al., 2019; Poghosyan, 2020; Illori et al., 2022).

DSA simulations for the four largest euro area economies

The EC does not make DSA code and data files publicly available. To illustrate the impact of changes in the EC's assumptions of how fiscal consolidation affects growth, we use a DSA replication. Consistent with Darvas et al. (2024), we use the May 2024 forecast of the EC based on the replication of the relevant DSA framework as outlined in Darvas et al. (2023). The code files for the DSA simulations are freely available (Welslau, 2024).

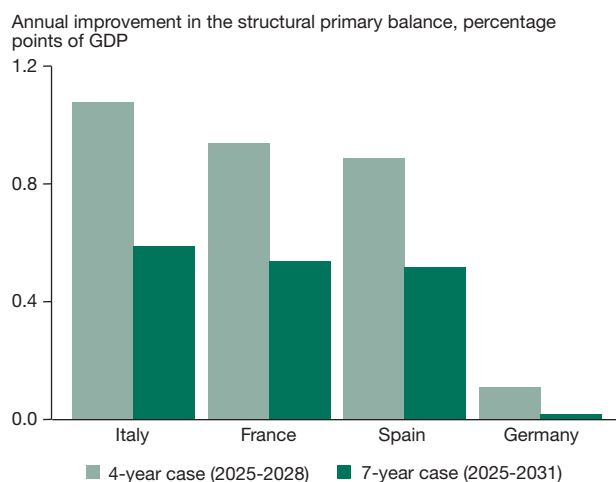
Figure 1 shows the fiscal adjustment requirements for the four largest euro area economies, which account for close to three-quarters of euro area GDP. We compare the four-year adjustment according to the reference trajectories with a seven-year adjustment case. Member states can apply for the seven-year adjustment by submitting a set of investments and reforms, which are to be evaluated by the EC – in particular according to whether the measures are growth-enhancing and consistent with debt sustainability. The EC will only grant an extension if it comes to the conclusion that the investments and reforms meet the criteria. The adjustment requirements in terms of the annual improvement in the structural primary balance are 1.08 percentage points of GDP in the four-year case (2025-2028) versus 0.59 percentage points in the seven-year case (2025-2031) for Italy; 0.94 percentage points in the four-year case versus 0.54 percentage points in the seven-year case for France; 0.89 percentage points versus 0.52 percentage points for Spain; and 0.11 percentage points versus 0.02 percentage points for Germany (Darvas et al., 2024).⁴ In the reformed EU fiscal rules, the so-called safeguards – which stipulate minimum fiscal adjustment requirements – are only applied if they are stricter than the DSA-based fiscal consolidation criterion. For all four of the largest euro area economies, the DSA-based fiscal consolidation requirement binds.⁵

Our simulations focus on the baseline adjustment scenarios of the EC with a four-year period over 2025-2028, after which the structural primary balance is assumed to remain unchanged at the 2028 level. We assume that the

⁴ Reformed EU fiscal rules will translate the adjustment requirements based on the structural primary balance into a so-called net expenditure path (e.g. Darvas et al., 2024).

⁵ For the seven-year adjustment, the 3% deficit cap binds for Italy, and the deficit resilience safeguard binds for France.

Figure 1
Fiscal consolidation requirements to meet reformed EU fiscal rules



Notes: The four-year case is based on the baseline adjustment in the reference trajectories. The seven-year case will only be granted if member states submit an investment and reform plan that is accepted by the EC.

Source: Darvas et al. (2024).

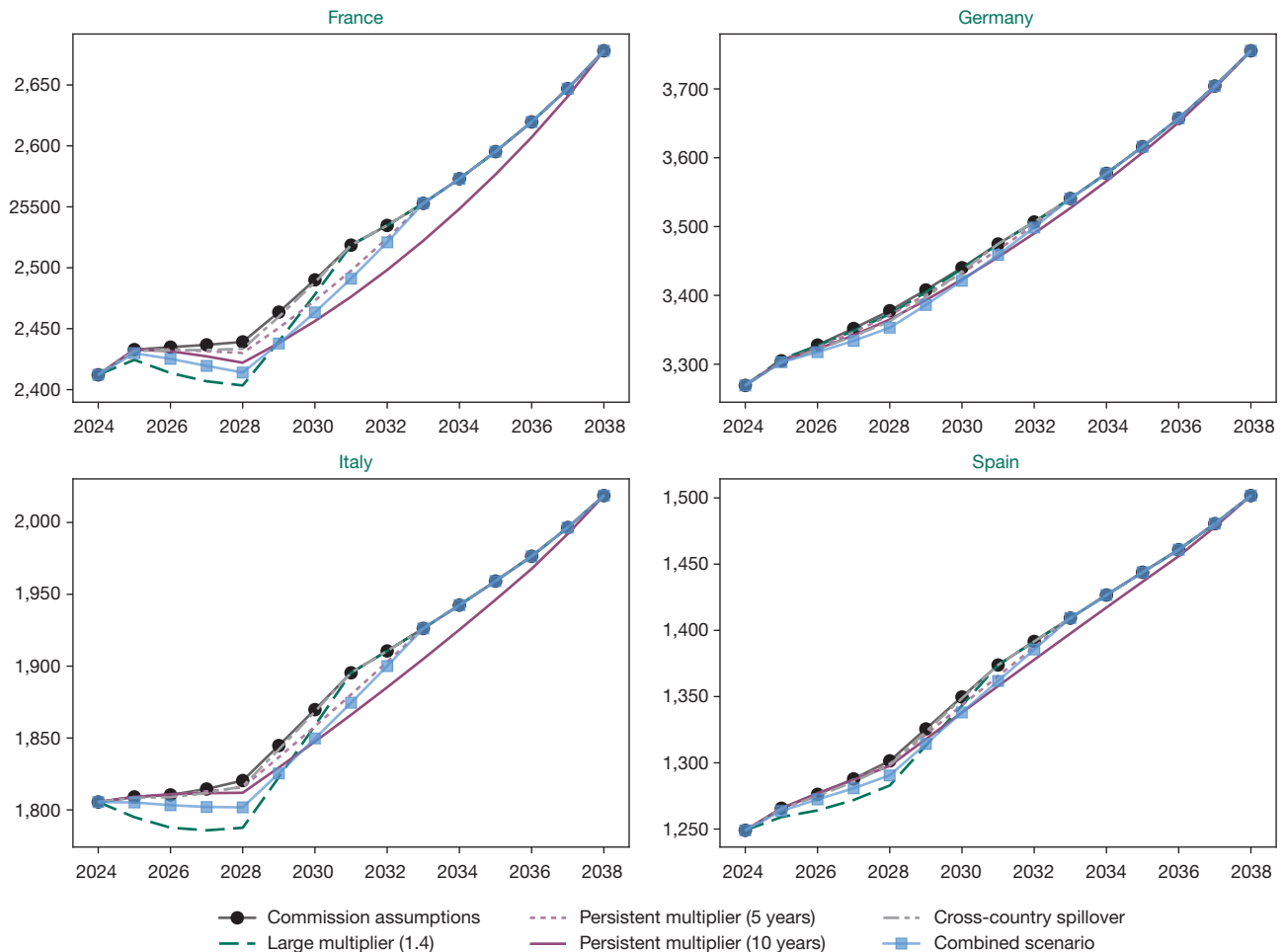
fiscal consolidation is implemented by each government according to the EU fiscal rules requirements.

Figure 2 shows DSA simulations for real GDP levels. Figure 3 presents the results for public debt ratios. We compare the EC's baseline adjustment scenario (in black) with five alternative scenarios. We typically change one assumption at a time to highlight how changes to a single assumption affect the overall results, keeping everything else constant. The only exception is the combined scenario, which uses a combination of plausible assumptions along several dimensions. In what follows, we first discuss the *ceteris paribus* scenarios and then move to the combined one.

First, the green lines in Figures 2 and 3 assess the impact of a larger average fiscal multiplier of 1.4 – which is the upper range of expenditure multipliers reported in Carnot and de Castro (2014) and broadly consistent with average multipliers for the euro crisis (e.g. Heimberger, 2017). For all countries except Germany, which does not adjust much domestically to meet reformed EU fiscal rules (see Figure 1), a larger short-run multiplier reduces real GDP compared to the baseline over the course of the adjustment period 2025-2028. However, from 2029 onwards the negative output gap (actual GDP below potential GDP) caused by the fiscal adjustment closes within three years due to the output gap closure rule. Nevertheless, the larger multiplier scenario leads to significantly higher public debt ratios in 2038 than under the baseline: by 4.5 percentage points of

Figure 2
DSA simulations of real GDP levels under different assumptions

Real GDP, billion euros



Notes: Baseline methodology based on European Commission (2024a) and requirements of the reformed fiscal framework. The large multiplier scenario increases the size of the contemporaneous fiscal multiplier from 0.75 to 1.4. The persistent multiplier scenarios assume linear phase out of contemporaneous multiplier effects over five or ten years instead of the three-year baseline. The cross-country spillover scenario assumes that consolidation affects trading partner's real GDP proportional to GDP weighted export shares. The combined scenario features a 0.9 fiscal multiplier, five-year persistence and cross-country spillovers.

Source: Welslau (2024), EC Spring 2024 forecast; authors' own calculations.

GDP in Italy, 3.4 percentage points in France, 3.4 percentage points in Spain and 0.2 percentage points in Germany.

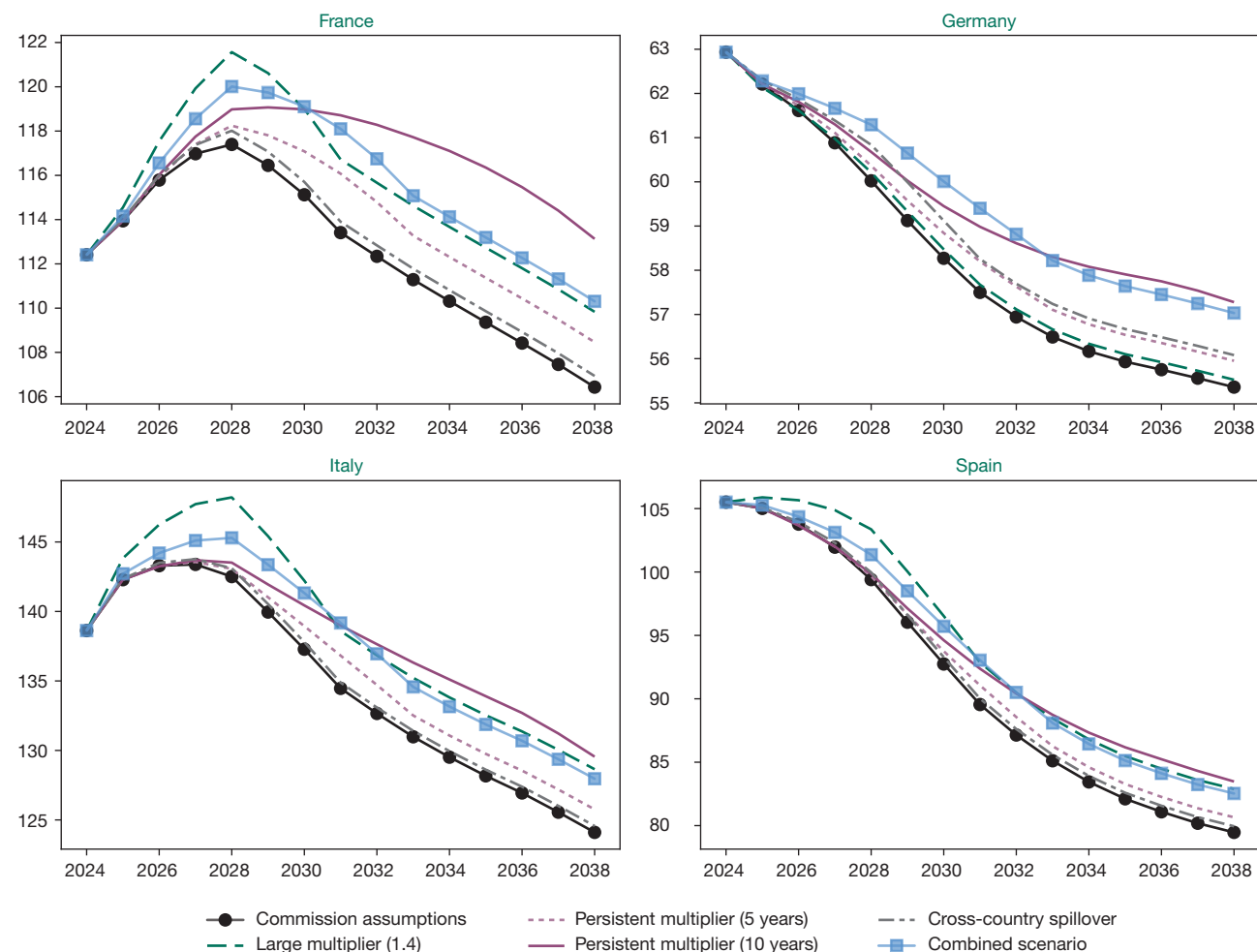
Second, we assume that the negative short-run growth effects of fiscal adjustment dissipate more slowly, using a five-year output gap closure rule instead of three years (dashed purple lines in Figures 2 and 3). This choice is within the range of the EC's previous output gap closure rules between four and seven years (Mc Morrow et al., 2017). For France, Italy and Spain – countries that deliver much larger domestic fiscal adjustments than Germany – we can see that real GDP levels revert more slowly back to the potential GDP path. This implies that public debt ratios turn out somewhat higher – although the differences

compared to the EC's baseline are not as pronounced as in the larger fiscal multiplier scenario. Third, the solid purple lines in Figures 2 and 3 show the impact of assuming an even longer drag of the negative growth effects of fiscal adjustment by setting a ten-year output gap closure. This is motivated by the literature suggesting that it may take at least ten years before hysteresis effects wash out (e.g. DeLong & Summers, 2012). Under this scenario, real GDP only reverts back to the potential GDP path by the end of the projection horizon. Hence, public-debt-to-GDP ratios in 2038 turn out significantly higher than under the baseline: by 6.7 percentage points in France, 5.4 percentage points in Italy, 4.0 percentage points in Spain and 1.9 percentage points in Germany.

Figure 3

DSA simulations of public-debt-to-GDP ratios under different assumptions

Public debt, % of GDP



Note: Baseline methodology based on EC (2024a) and requirements of the reformed fiscal framework. The large multiplier scenario increases the size of the contemporaneous fiscal multiplier from 0.75 to 1.4. The persistent multiplier scenarios assume linear phase out of contemporaneous multiplier effects over five or ten years instead of the three-year baseline. The cross-country spillover scenario assumes that consolidation affects trading partner's real GDP proportional to GDP weighted export shares. The combined scenario features a 0.9 fiscal multiplier, five-year persistence and cross-country spillovers.

Source: Welslau (2024), EC Spring 2024 forecast; authors' own calculations.

Fourth, we assume that fiscal consolidation by trading partners spills over into domestic economic activity (grey lines). This scenario is coherent with the literature that finds cross-country spillovers of fiscal adjustment, especially in the euro area context (e.g. in 't Veld, 2013; Poghosyan, 2020). We model spillover effects based on GDP-weighted export links with other countries. Hence, a fiscal consolidation in country B affects country A's real GDP proportional to the share that exports to country B make up in its GDP.⁶ If consolidation reduces growth

⁶ Export/GDP shares are calculated as annual averages from 2001 to 2019 and are assumed to remain constant over time.

in country B, its import demand is assumed to decline proportionally, which in turn affects real GDP in country A. Because reductions in growth that spill over to other countries in this way are themselves a function of spillovers from all other countries, we iteratively calculate the equilibrium effect of all spillovers.

Due to the negative impact of spillovers on domestic GDP growth, public debt ratios in 2038 are higher than under the EC's assumptions for all countries: by 0.7 percentage points of GDP in Germany, and by 0.5 percentage points in France, Italy and Spain. The results suggest that spillovers have a slightly larger impact on

Germany, because Germany has strong trade links with many EU countries, including those that have to implement sizeable fiscal adjustments to meet EU fiscal rules. While these findings suggest that spillovers can have an impact, the assumption on a larger fiscal multiplier and a longer output gap closure rule are quantitatively more important for the countries that implement sizeable fiscal adjustments to meet EU fiscal rules at home. Germany is the only country where the spillover assumption has a larger impact on the projected public debt ratio than in the larger fiscal multiplier scenario and the five-year output gap closure scenario. This is because Germany only has to adjust little domestically to meet EU fiscal rules (see Figure 1).

Finally, the blue lines in Figures 2 and 3 refer to the combined scenario where we assume: a short-run fiscal multiplier of 0.9, motivated by empirical findings of average multipliers just below unity (e.g. Carnot & de Castro, 2015; Gechert, 2015); a five-year output gap closure rule, arguably a conservative choice based on the literature pointing to slow dissipation of negative output effects (e.g. DeLong & Summers, 2012); and cross-country spillover effects of fiscal adjustment modelled based on export links (e.g. Goujard, 2017), where we take the same approach as in the previous spillovers scenario. Our assumptions do not involve any extreme choices, as we refrain from assuming multipliers above one, very slow dissipation of growth effects of fiscal adjustment during downturns, or magnified spillovers due to interactions with domestic growth slumps. The results point to lower real GDP levels during the adjustment period 2025-2028 than under the EC's baseline assumptions. Although GDP reverts back to the path of potential GDP in 2033 by assumption, the stronger growth drag from fiscal adjustment up to that point leads to significantly higher public debt ratios. Public debt ratios consistently turn out higher than under the adjustment baseline, albeit the difference varies across countries – with 3.9 percentage points of GDP in France, 3.9 percentage points in Italy, 3.1 percentage points in Spain and 1.7 percentage points of GDP in Germany.

Conclusions

Reformed EU fiscal rules will have a major impact on the fiscal policy stance in EU member states, with potentially negative implications for economic growth. DSA plays a pivotal role, as it serves as the key analytical tool to calculate how much fiscal adjustment is required to keep the public debt ratio on a plausibly downward trajectory (or at “prudent” levels). This paper contributes by providing a quantitative assessment of key assumptions in the underlying DSA framework.

We have shown that the EC's DSA projections for real GDP levels and public debt ratios are sensitive to the assumptions of how fiscal consolidation affects economic growth. We have presented simulations under different scenarios, in which we vary the short-run fiscal multiplier, assume a slower dissipation of negative output effects and introduce cross-country spillovers that make fiscal adjustment by trading partners spill over into domestic economic activity. Our results suggest that the EC's baseline adjustment scenario may be too optimistic: under realistic alternative DSA assumptions of how fiscal adjustment affects growth, real GDP levels turn out significantly lower during the adjustment, so that public debt ratios do not fall as expected by the EC. Although public debt ratios do decline in the medium run, Germany, France, Italy and Spain could face public debt levels that are, on average, 3.1 percentage points of GDP higher at the end of the projection horizon (2038) than under the EC's assumptions.

What are the policy implications? The large euro area economies with high public debt ratios (France, Italy and Spain) – which will have to adjust significantly more than their EU peers – may experience more adverse domestic growth effects than currently expected. In particular, this will be the case if average fiscal multipliers turn out larger and/or if the negative short-run growth effects from fiscal adjustment dissipate more slowly than assumed by the EC. Although a level shift in public debt ratios need not endanger debt sustainability in the medium run, economic stagnation and a larger-than-expected increase in public debt ratios in the short run may erode the confidence of voters and bond investors. Should cross-country spillovers materialise, Germany and other EU countries with strong intra-EU trade links will experience lower growth due to the restrictive fiscal policy stance by important trading partners. Compensating for the drag on growth due to lower import demand from EU trading partners may not be an easy task in the current environment.

Our simulations suggest that pursuing public debt reduction across the EU's member states by going for simultaneous fiscal consolidation could prove counterproductive in the short run if the negative growth effects of simultaneous adjustments are underestimated. The end result could be significantly higher public debt ratios than expected and growing divergence between EU member states.

References

- Alloza, M., Burriel, P., & Pérez, J. (2019). Fiscal policies in the euro area: Revisiting the size of spillovers. *Journal of Macroeconomics*, 61, 103132.

- Auclert, A., Rognlie, M., & Straub, L. (2024). The Intertemporal Keynesian Cross. *Journal of Political Economy* (forthcoming).
- Auerbach, A., & Gorodnichenko, Y. (2012). Measuring the output responses to fiscal policy. *American Economic Journal: Economic Policy*, 4(2), 1–27.
- Batini, N., Eyraud, L., Forni, L., & Weber, A. (2014, September). *Fiscal multipliers: size, determinants, and use in macroeconomic projections* (IMF Technical Notes and Manuals).
- Blanchard, O., Leandro, A., & Zettelmeyer, J. (2021). Redesigning EU fiscal rules: from rules to standards. *Economic Policy*, 36(106), 195–236.
- Bonomi, D., de Haan, J., & Soederhuizen, B. (2022). The effects of fiscal policy at the effective lower bound. *Macroeconomic Dynamics*, 26(1), 149–185.
- Buti, M., & Giudice, G. (2002). Maastricht's fiscal rules at ten: an assessment. *Journal of Common Market Studies*, 40(5), 823–848.
- Caldara, D., & Kamps, C. (2017). The Analytics of SVARs: A Unified Framework to Measure Fiscal Multipliers. *Review of Economic Studies*, 84(3), 1015–1040.
- Canzeroni, M., Collard, F., Dellas, H., & Diba, B. (2016). Fiscal multipliers in recessions. *Economic Journal*, 126(590), 75–108.
- Carnot, N., & de Castro, F. (2015). The discretionary fiscal effort: an assessment of fiscal policy and its output effect. *European Economy – Economic Papers*, 543.
- Darvas, Z., Welslau, L., & Zettelmeyer, J. (2023). A quantitative evaluation of the European Commission's fiscal governance proposal. *Bruegel Working Paper*, 16/2023.
- Darvas, Z., Welslau, L., & Zettelmeyer, J. (2024). The implications of the European Union's new fiscal rules. *Bruegel Policy Brief*.
- DeLong, B., & Summers, L. (2012). Fiscal policy in a depressed economy. *Brookings Papers on Economic Activity*, 43(1), 233–274.
- European Commission. (2016). Towards a positive fiscal stance for the euro area, Communication from the Commission, COM(2016) 727 final.
- European Commission. (2022). Fiscal sustainability report 2021. *European Economy – Institutional Paper*, 171.
- European Commission. (2024a). Debt Sustainability Monitor 2023. *Institutional Paper*, 271.
- European Commission. (2024b). *2024 Ageing Report*, forthcoming.
- Fatas, A. (2019). Fiscal policy, potential output, and the shifting goals. *IMF Economic Review*, 67(3), 684–702.
- Gechert, S. (2015). What fiscal policy is most effective? A meta-analysis. *Oxford Economic Papers*, 67(3), 553–580.
- Gechert, S., Hughes Hallett, A., & Rannenberg, A. (2016). Fiscal multipliers in downturns and the effects of Eurozone consolidation. *Applied Economics Letters*, 23(16), 1138–1140.
- Gechert, S., & Rannenberg, A. (2018). Which fiscal multipliers are regime-dependent? A meta-regression analysis. *Journal of Economic Surveys*, 32(4), 1160–1182.
- Goujard, A. (2017). Cross-country spillovers from fiscal consolidations. *Fiscal Studies*, 38(2), 219–267.
- Guzman, M. (2016). Definitional issues in the IMF debt sustainability analysis framework: a proposal. *CIGI Policy Brief*, 77.
- Heimberger, P. (2017). Did fiscal consolidation cause the double-dip recession in the euro area? *Review of Keynesian Economics*, 5(3), 539–558.
- Heimberger, P. (2023). Debt sustainability analysis as an anchor in EU fiscal rules: an assessment of the European Commission's reform orientations, in-depth analysis requested by the ECON committee of the European Parliament.
- Heimberger, P., Huber, J., & Kapeller, J. (2020). The power of economic models: The case of the EU's fiscal regulation framework. *Socio-Economic Review*, 18(2), 337–366.
- Iltzetzki, E., Mendoza, E., & Vegh, C. (2013). How big (small?) are fiscal multipliers? *Journal of Monetary Economics*, 60(2), 239–254.
- Ilori, A. E., Paez-Farrell, J., & Thoenissen, C. (2022). Fiscal policy shocks and international spillovers. *European Economic Review*, 141(1), 103969.
- in 't Veld, J. (2013). Fiscal consolidations and spillovers in the euro area periphery and core. *European Economy – Economic Papers*, 506.
- Jarocinski, M., & Lenza, M. (2018). An inflation-predicting measure of the output gap in the euro area. *Journal of Money, Credit and Banking*, 50(6), 1189–1224.
- Jorda, O., & Taylor, A. (2016). The time for austerity: estimating the average treatment effect of fiscal policy. *Economic Journal*, 126(590), 219–255.
- Karras, G. (2012). Trade openness and the effectiveness of fiscal policy: some empirical evidence. *International Review of Economics*, 59(3), 303–313.
- Leeper, E., Traum, N., & Walker, T. (2017). Clearing up the fiscal multiplier morass. *American Economic Review*, 107(8), 2409–2454.
- Mc Morrow, K., Roeger, W., & Vandermeulen, V. (2017). Evaluating Medium Term Forecasting Methods & their Implications for EU Output Gap Calculations. *European Economy Discussion Paper*, 070.
- McKay, A., Nakamura, E., & Steinsson, J. (2016). The Power of Forward Guidance Revisited. *American Economic Review*, 106(10), 3133–3158.
- Paetz, C., & Watzka, S. (2024). The new fiscal rules: another round of austerity for Europe? *IMK Policy Brief*, No. 176.
- Poghosyan, T. (2020). Cross-country spillovers of fiscal consolidations in the euro area. *International Finance*, 23(1), 18–46.
- Ramey, V. (2019). Ten years after the financial crisis: what have we learned from the renaissance in fiscal research? *Journal of Economic Perspectives*, 33(2), 89–114.
- Regulation (EU) 2024/1263. Regulation EU (2024) of the European Parliament and of the Council of 29 April 2024 on the effective coordination of economic policies and on multilateral budgetary surveillance and repealing Council Regulation (EC) No. 1466/97.
- Welslau, L. (2024). *EU-Debt-Sustainability-Analysis* (Replication of the European Commission's DSA in Python). <https://github.com/lennard-welslau/eu-debt-sustainability-analysis/> [last version based on the July 2024 update]
- Woodford, M. (2011). Simple analytics of the government spending multiplier. *American Economic Journal: Macroeconomics*, 3(1), 1–35.
- Wyplosz, C. (2011). Debt sustainability assessments: mission impossible. *Review of Economics and Institutions*, 2(3), 1–37.

Thomas Schwab

Quo Vadis, Cohesion Policy? European Regional Development at a Crossroads

European cohesion policy is undergoing a significant identity crisis, with debates intensifying over its fundamental goals and strategies for fostering regional development. Global challenges and shifting geopolitical dynamics further complicate the quest for successful regional development, introducing new trade-offs. This paper presents a comprehensive analysis of the core issues within this debate, explores their broader implications and proposes preliminary recommendations to address the emerging obstacles cohesion policy is facing.

Cohesion policy has never faced such an intense and fundamental debate. In a time of war, trade rivalry, climate change and digital transition, its relevance is under serious question. As Europe's structural policy to improve economic, social and territorial conditions with long-term planning horizons, cohesion policy barely seems to have any place in a world where policymakers overwhelmingly react rapidly to short-term crises.

However, cohesion policy is relevant to most crises and problems in Europe. Unlike many policies enacted at short notice, it aims to address root causes such as a lack of competitiveness, inadequate infrastructure or low institutional quality. It is thus a set of preventive measures designed to make cities, regions and Europe as a whole resilient to future crises. So why is the EU's longest-serving investment instrument under so much pressure to justify its very existence?

Origins and purpose of cohesion policy

When Jacques Delors outlined his vision of the Single Market, he correctly predicted that economic efficiency would not benefit all regions of Europe equally (Jouen, 2017). Thus, in 1993, cohesion policy was brought into being to ensure equitable participation in growth and prosperity across Europe. Its goal was to create a level playing

field by addressing disparities in economic development, structures and geographic conditions. This political ambition was clearly stated in the EU treaties (Article 174 TFEU and Article 130d EC Treaty).

At its core, cohesion policy tries to rebalance the mismatch between efficiency and equity within the Single Market. An efficient market could lead to a further concentration of economic activity in a few urban regions – leaving many places on the periphery behind. Cohesion policy thus seeks to involve all regions and people in shared prosperity. In this sense, it is the flip side of the Single Market.

The policy is not designed as a compensatory mechanism but as an instrument for empowerment. Its purpose is not to act as a “solidarity tax”, supplementing or even replacing member states' social policies, but rather to support regions in establishing equal opportunities for individuals and businesses.

In an increasingly integrated Europe, cohesion policy transcends mere economic equity to address social and territorial disparities. It encompasses investments in physical infrastructure, such as railways and roads, alongside those in education and skills training to bolster social cohesion. Ultimately, cohesion policy strives to fos-

Thomas Schwab, Bertelsmann Stiftung, Berlin, Germany.

© The Author(s) 2024. Open Access: This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>).

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

ter comparable living standards for all Europeans, regardless of where they live and work.

The policy also acts in support of other policies. For example, it plays a pivotal role in delivering the Green Deal by ensuring a “just” transition for regions affected in different ways via the Just Transition Fund. Also, the European Regional Development Fund and the Cohesion Fund, both representing the largest chunk of cohesion funding, dedicate at least 30% and 37% respectively of their spending to the green transition (European Parliament Research Service, 2021). Moreover, in response to geopolitical challenges such as the Russian invasion of Ukraine, the policy has been drawn upon to ensure affordable energy prices and support refugee integration, underscoring its relevance in navigating a turbulent and rapidly changing global landscape.

Cohesion policy is labelled “the glue that binds Europeans together” (European Commission, 2024a). And, indeed, it is the prospect of upward convergence in prosperity terms created by the Single Market and cohesion policy that makes the European project so attractive. This success story has garnered international recognition, with institutions like the World Bank (2018) praising Europe as a “convergence machine”. However, failure to uphold this promise risks eroding the EU’s appeal, fostering geographical discontent and undermining European integration (Rodríguez-Pose et al., 2024).

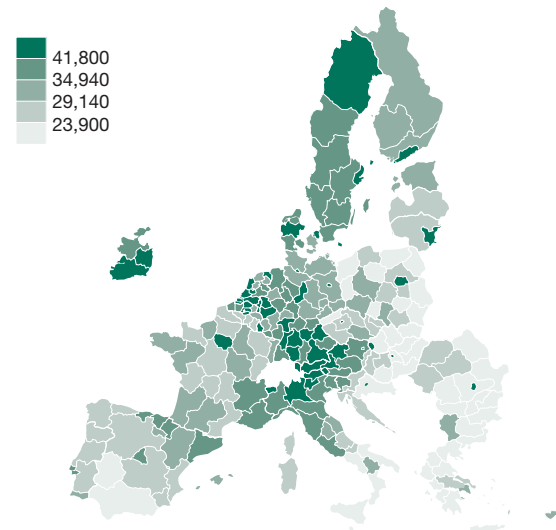
Less inequality – but still work to do

Since the Single Market began in 1993, all European regions have made economic advances (Gerland & Schwab, 2022). However, their progress differs greatly, with regions in Central and Eastern Europe having gained the most. Today, the most prosperous regions, primarily urban, are concentrated in the core of Europe, while many Eastern and Southern rural regions still lag behind in their economic, social and territorial development (see Figure 1).

Overall, disparities across Europe have been eroded – but not equally. Regions in Southern Europe in particular have gained little and even experienced stagnation lately. Hence, there is still considerable scope for improving cohesion.

The policy serves as a significant financial lever for public investments in Europe. For some countries, this can be over 80% of the total (OECD, 2020). Cohesion policy funds are typically augmented with national monies through co-financing and leveraged with private capital, with the European Investment Bank (EIB, 2023) playing a crucial role.

Figure 1
Highest levels of economic prosperity in the core,
lowest in the periphery



Note: GDP per capita in 2022, euro (measured in purchasing power parities).

Source: Eurostat (2024), own illustration.

Most cohesion funding is financed from the EU budget: of €1210.9 billion planned for the current Multiannual Financial Framework (MFF), the seven-year EU budget, €372.6 billion are devoted to cohesion funding (see Figure 2) – second in volume only to the common agricultural policy.

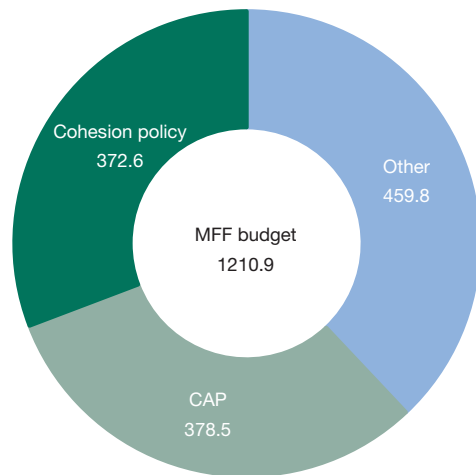
Cohesion policy is also about developing regional strategies bottom-up to empower local actors and about facilitating inter-regional cooperation on knowledge exchange. This aims to pave the way for individual place-based regional developments.

Initiatives like the Smart Specialisation Strategies (S3) for innovation exemplify this approach (European Commission, 2009). These strategies identify regional strengths and potentials, providing a platform for various regional stakeholders to collaborate and realise these potentials in research and innovation. This bottom-up approach is vital for all European regions, irrespective of their current development levels, and enhances competitiveness continent-wide.

Fostering cooperation between different regions is crucial for European integration and maximising European value added. The Interreg programme is a prime example of this effort, connecting regions across national borders throughout Europe. Interreg facilitates collaborations,

Figure 2
Cohesion policy makes up the second-largest share in EU spending

in billion euros



Note: Multiannual Financial Framework (MFF) budget in 2020 prices.

Source: European Commission (2021), author's own illustration.

knowledge exchange and economic development with relatively modest funding, representing around only 3% of the cohesion policy budget (Letta, 2024).

Strengthening institutions is another critical aspect of cohesion policy. Robust institutions are essential for implementing effective development strategies and ensuring sustainable growth. The policy supports institutional capacity-building through various programmes and initiatives, enhancing governance and administrative efficiency across regions (Benford, 2023).

What the current debate is about

With new policy priorities emerging, a changing global landscape, a new EU legislative cycle, and negotiations on the future EU budget set to begin next year, a far-reaching debate on cohesion policy has begun. It broadly encompasses four areas:

- mission
- financing and economics
- optimal policy design with lessons learnt from the Recovery and Resilience Facility (RRF)
- synergies with other policies.

Quest for cohesion policy's mission

Cohesion policy is set up to achieve various goals, such as helping lagging regions to catch up, helping others

maintain their progress in a time of transition and fostering solidarity, especially during crises. Over time, its objectives have evolved (Idczak et al., 2024). Recently, security has been added to the discussion mix to acknowledge the growing importance of Europe's geopolitical dimension (Hunter, 2024). In sum, cohesion policy needs to navigate through multiple trade-offs.

Multi-tool vs precision tool

Economic development is complex, and cohesion policy aims to address numerous aspects simultaneously. However, the policy is already burdened with many goals (Tarschys, 2008), and there is a tendency to expand these objectives even further (Bachtler & Mendez, 2020).

However, too many objectives dilute the effectiveness of pursuing individual goals and create a perception of limited overall progress. Therefore, it is crucial to prioritise and clarify primary objectives. Equally important is to define what cohesion policy is not (primarily) about. This consolidation would better align with the toolbox of European policies and facilitate clearer communication about its purpose to the public.

Consolidating the objectives of cohesion policy is necessary to put the focus on its actual goal: reducing social, economic and territorial disparities across Europe. When prioritising objectives to pursue this goal, emphasis should be on those offering the highest European value added. Examples include fostering competitiveness, accompanying the digital transition or mitigating adverse effects of the green transition.

Long-term vs short-term perspective

Sustainable development of regions requires investments in such things as roads that take time to yield results. However, short-term policy interventions, such as those seen during the COVID-19 pandemic or the energy crisis following the Russian invasion of Ukraine, often take precedence. During these crises, the policy planning horizon shifted from years to mere weeks or even just days. Initiatives like Coronavirus Response Investment Initiative (CRII) and Supporting Affordable Energy (SAFE) exemplify how cohesion policy adapted by redirecting funds to address immediate needs (European Commission, 2021a; European Commission, 2022).

Cohesion policy proved that it can adapt quickly to changing circumstances. However, this clashes with the long-term goal of improving living conditions and economic structures in regions, which requires a sustained commitment. Short-term policy responses should not come at the cost of long-term programming.

Past vs future orientation

Cohesion policy has traditionally focused on overcoming disparities resulting from past adverse developments or misguided policy decisions. This requires tangible investments and structural reforms to resolve outstanding issues.

The green and digital transition has the potential to create new disparities across European regions (Maucorps et al., 2023). Preventing disparities is cheaper than surgical measures to combat them. This requires not only a different set of instruments but could also mean tailoring interventions to different regions. Different strategies and instruments for preventing and resolving disparities are the result. A successful cohesion policy must work on both mitigating existing disparities and avoiding new ones.

All regions vs few regions

Since 2007, all European regions are being addressed by cohesion policy (Bachtler, 2022). However, the focus is clearly on lagging regions, commonly defined by a low share of regional GDP compared to the EU27 average.

The trade-off between funding all regions versus only a few is particularly relevant for EU enlargement. With Ukraine, Moldova and Western Balkan countries potentially joining, many lagging regions will enter the EU. However, there are concerns about reconfiguring the current allocation scheme to ensure that cohesion spending does not explode and enlargement does not come at the expense of “old” regions. But these anxieties are not borne out by recent studies (Nuñez Ferrer et al., 2024; Lindner et al., 2023).

An exclusive focus on the most lagging regions not only shrinks the broader relevance of cohesion policy, but also curtails the application of non-financial instruments with potentially the highest European value added. The biggest asset of cohesion policy is bringing together different regions and fostering knowledge, and this requires the broadest possible participation of all European regions.

Finance and economics

As one of the largest components of EU spending, cohesion policy will be a prime concern in the debate on the next MFF. With the mid-term evaluation for the ongoing period 2021-2027 in play (European Council, 2024), the debate and planning for the next period have already started and are expected to intensify in 2025 and beyond.

Competition for funding

The financial requirements to address contemporary challenges and new policy priorities are enormous. For instance, if Europe is to become climate neutral, additional investments of €300–€600 billion per year are needed (Calipel et al., 2024; European Commission, 2023).

With about one-third of total EU expenditures destined for cohesion, it is tempting to redistribute some of its funds for other policy priorities.

Given the prospect of repaying the loans made for the RRF from 2028 (European Commission, 2021b) – around €30 billion per year – overall fiscal room for manoeuvre is narrowing. Maintaining the status quo of the EU budget will be a big challenge. Overall, it is relatively small. Annually, it nearly matches that of Austria, a small but wealthy member state with a population of 9 million. Considering the EU’s challenges and financial demands on it to address them, this creates a fundamental dilemma going way beyond the discussion of cohesion policy funding.

Resolving this requires either an expansion of the EU budget or political prioritisation. If the latter, economic considerations such as the highest return on investment must be central.

Mixed results on effectiveness

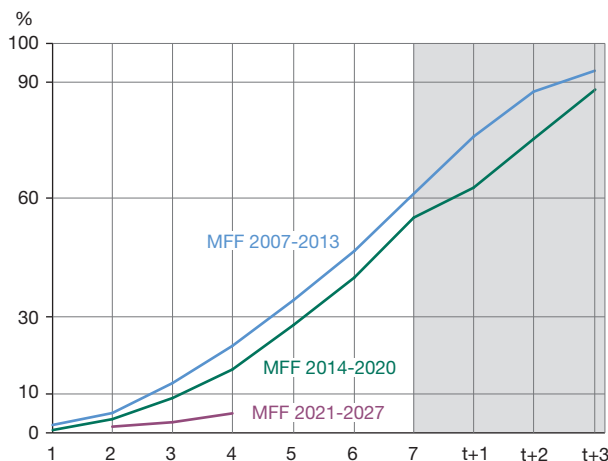
All European regions have gained in economic prosperity since the advent of the Single Market (Gerland & Schwab, 2022). Gains were impressive in Central Eastern Europe. For instance, Poland’s GDP is 40% higher thanks to EU membership (Kopiński et al., 2024). Overall, inequality has declined since 1993.

However, especially in Southern Europe, regions started to stagnate, becoming labelled as being in a “development trap” (Diemer et al., 2022). There is a growing urban-rural divide observable across European regions (Eurofound, 2023). What is more, income inequality seems to be growing within countries (Marzinotto, 2012) and regions (Lang et al., 2022).

Attributing the observed upward convergence in Europe to cohesion policy is increasingly disputed. The findings of the academic literature on the economic effectiveness of cohesion policy are mixed, despite a generally positive tendency (von Ehrlich, 2024; Dall’Erba & Fang, 2015).

Cohesion in Europe has improved since the advent of the Single Market. The exact contribution of cohesion policy to this development is hard to pin down. This requires rig-

Figure 3
Absorption rate of cohesion policy is falling over time



Note: Delayed start of current Multiannual Financial Framework (MFF) period 2021-2027.

Source: European Commission Cohesion Open Data Platform, author's own illustration.

orous research using state-of-the-art methods and better data with higher granularity linked to other sources such as firm information.

Declining absorptive capacity

The absorption rate of cohesion policy funds is declining from one seven-year MFF cycle to the next. Strikingly, at the end of one programming period, just 60% or so of the planned spending has taken place. It will take about three more years to approach 90%.

In the current period, the rate shows an even lower trend. By 2024 or three years in, only 5.1% of available funds have been absorbed (see Figure 3). Despite the usual problem of overlapping spending cycles, the prioritisation of RRF funds for both rapidly approaching deadlines and political reasons are the main drivers here (Nuñez Ferrer & Ruiz de la Ossa, 2022). In addition, the regulation for the current funding cycle was amended in June 2021 – six months after the start of the programming period, i.e. later than ever.

The least developed regions tend to exhibit the lowest absorption rates (European Parliament, 2013). These often expose deficits in the quality of governance and institutional capacity.

The persistently low absorption rates, especially in the least developed regions, reveal shortcomings in cohesion policy design. The EU, member states and regions must

streamline administrative processes, focus more on capacity building and improve institutional quality to ensure that cohesion funding has the most impact.

Lessons learnt from the Recovery and Resilience Facility

The COVID-19 pandemic saw the introduction of NextGenerationEU with the RRF at its core. Initially conceived as a short-term crisis instrument, the RRF turned out to be a tool for structural development – aiming for objectives similar to those of cohesion policy (Cecchi, 2023). Despite this genesis, RRF functioning and mechanisms differ substantially from cohesion policy, making a natural case to benchmark differences in design (see, e.g. European Court of Auditors, 2023).

Bottom-up vs top-down

Cohesion policy is not only grounded in territoriality, but also in bottom-up decision-making. This approach ensures that a diverse array of stakeholders – including local politicians, business leaders, trade unions and other civil society representatives – participate in shaping strategic initiatives. This inclusivity is viewed as a success factor for applying a structural policy that is closely aligned with the real needs of regions and their inhabitants (Cappellano et al., 2024).

The bottom-up approach based on multi-level governance has proven effective in identifying regional pain points, leveraging crowd intelligence and fostering democratic participation with higher stakeholder buy-in. However, this extensive coordination requires time, making cohesion policy relatively slow to implement.

In contrast, the RRF adopts a top-down approach. Here programming is negotiated solely between the European Commission and member states, excluding regional and civil society voices (European Committee of the Regions, 2024). This streamlined stakeholder involvement accelerates policy execution but raises questions about how well regional needs are met and whether the best strategies for local development are identified.

Cohesion policy must improve its speed of implementation. However, it is crucial to find a balance between the ponderous, but inclusive bottom-up cohesion policy approach, and the agile, but less democratic RRF approach.

EU vs national

Every EU member state operates its own redistribution mechanisms, which can range from formal fiscal equalisation schemes to project-based approaches akin to co-

hesion policy. So, why should the European level replicate these national structures?

Given that the Single Market encompasses the entire EU, it is logical to address inequality and structural development on a pan-European scale and in a coordinated manner. European competence enables regional connections to bypass member states so they can act as a form of grassroots European integration with broad social participation. A cohesion policy devolved to member states would render such cooperative efforts across borders more challenging, if not impossible.

Beyond economic considerations (see, e.g. Ragnitz, 2018), this is also a matter of democracy and power dynamics. When regional development is exclusively managed by national governments, regions can be entirely at the mercy of their central authorities.

The Single Market is inherently a policy under European governance. Thus, the umbilically linked cohesion policy should operate on the same level playing field to be effective. Delegating regional development to member states changes the relationship between national and regional levels of power, raising not least concerns about how to mitigate democratic deficits.

No strings attached vs conditionality

Regions in “development traps” face numerous challenges. Beyond deficits in production factors like labour and capital, they often suffer from weak institutional frameworks that hinder effective governance and the successful implementation of cohesion policies (European Commission, 2024a).

Moreover, these regions are often found in member states that are overdue for structural reforms in areas such as the labour market, pension systems and taxation. They also need to uphold the rule of law to prevent anti-democratic tendencies. Consequently, there is growing support for linking cohesion funds closer to the European Semester, the far-reaching economic and fiscal policy coordination of the EU. This would create a “cash-for-reforms” approach for cohesion policy similar to that of the RRF.

While there is a consensus on the need for reforms to create an environment conducive to the effective use of cohesion funds (European Commission, 2024a; European Commission, 2024b), the challenge lies in implementing conditionality effectively. Ideally, conditions should be geared to the level of government responsible for the relevant changes, as suggested by connexity theory (Ragnitz, 2018). However, cohesion policy primarily addresses regions, while European Semester conditions are usually di-

rected at national governments, which hold the necessary competencies for systemic reforms such as pension or labour market overhauls. This misalignment only results in indirect pressure on regions, which is neither efficient nor democratic.

For “development trapped” regions, structural reforms at the member state level are the key to progress. However, regions often lack the authority to implement these necessary reforms. Consequently, conditionality can inadvertently make regions hostages to their national government’s shortcomings, hindering access to the funds they need.

Simple vs bulletproof

Cohesion policy currently operates through six distinct funds (Figure 4), each with hundreds of regional programmes. These funds include:

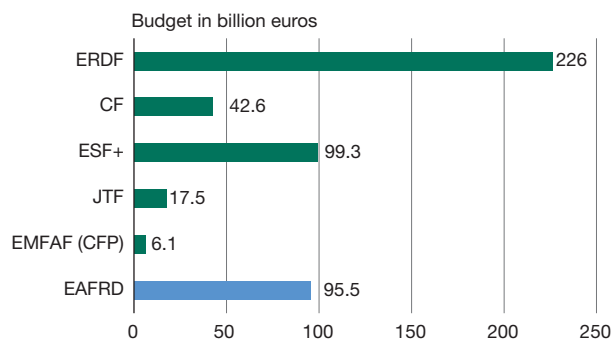
- European Regional Development Fund: investments for competitiveness, innovation, the green transition and European territorial cooperation
- Cohesion Fund: targets environment and transport infrastructure in poorer regions in member states with gross national income per capita below 90% of EU-average
- European Social Fund Plus (ESF+): concentrates on human capital development and social aspects
- Just Transition Fund: supports Green Deal implementation
- European Maritime, Fisheries and Aquaculture Fund (EMFAF): budget for the EU common fisheries policy
- European Agricultural Fund for Rural Development (EAFRD), *managed by DG AGRI*: contributes to regional development in rural areas, part of the common agricultural policy.

The underlying complexity and fragmentation impose extensive burdens on strategic programming and advancement at the EU level.

In contrast, the RRF operates with a single budget and integrated plans set up by member states, simplifying overall governance and enabling easier funding for large-scale projects.

To fulfil the goals of each fund and ensure compliance in delivery, countless administrative regulations are in place.

Figure 4
Overview of the six cohesion funds



Notes: Budget of funds in billion euros for the current MFF period 2021-2027. ERDF: European Regional Development Fund; CF: Cohesion Fund; ESF+: European Social Fund Plus; JTF: Just Transition Fund; EAFRD: European Agricultural Fund for Rural Development.

Source: European Parliamentary Research Service Fact Sheets, own compilation and illustration.

Joint delivery of cohesion policy via the partnership principle creates a system of checks and balances between the European Commission and member states. On top, regulations vary across member states for the same fund, often including national “gold plating” which adds extra regulation.

This complex policy delivery raises concerns about the high administrative burden, limited absorptive capacity and slow processing times, discouraging applicants from pursuing projects. The issue is particularly severe in wealthier regions, where higher national co-financing rates make cohesion funding less attractive.

While the RRF theoretically has fewer compliance rules, in practice, compliance costs remain high due to complex auditing requirements, with the European Court of Auditors responsible for auditing national budgets. This is a common problem across many European policies, where stakeholders frequently complain about excessive, over-complicated, and time-consuming red tape.

Streamlining the setup of cohesion policy is crucial for increasing its effectiveness, impact and speed. Combining funds could simplify planning and administration. While reducing red tape is essential, it must not compromise fraud prevention. This can be achieved by rethinking auditing systems to focus more on ensuring that regional and national fraud prevention measures are robust. Additionally, it is important to ensure that civil servants are not incentivised to maintain red tape for risk aversion reasons.

Leveraging policy synergies

Cohesion policy is – and should be – not the only policy dealing with cohesion (European Commission, 2024a). Virtually every policy touches on the trade-off between efficiency and equity, making cohesion a fundamental aspect of all policy areas. Some policies can support cohesion policy, while others may undermine it. Therefore, leveraging synergies is crucial for promoting a cohesive Europe efficiently.

EU policies

The EU enacts numerous policies annually, all of which, whether regulatory or fiscal in nature, can enhance or diminish cohesion across Europe.

The prime example is the Single Market: regulations designed for it may benefit some regions while adversely affecting others. A good example is the green transition that, with the shift to renewable energy at its core, comes with a substantial overhaul of the economy. Phasing out fossil energy production will eradicate some economic activity, while phasing in renewable generation will create jobs and value added. This transformation actually favours lagging rural regions and is thus improving cohesion (Többen et al., 2023; Schwab, 2023a). By aligning cohesion policy with energy policy, the maximum impact of both can be achieved.

Furthermore, the development of green and digital technologies offers vast potential across Europe. By fostering collaboration among regions with complementary capabilities, new technological advances and thus economic activities can emerge, particularly in lagging regions. This can be beneficial for cohesion (Bachtrögler-Unger et al., 2023; Schwab, 2023b).

To maximise cohesion, it is essential to strategically leverage synergies between cohesion policy and other EU policies. This does not require other policies to share the same goals as cohesion policy but to acknowledge their positive or negative effects on cohesion. Strategic planning is needed and must be based on a rigorous analysis of the heterogeneous effects of policies. This is especially important in a time of narrowing fiscal space.

National policies

Cohesion policy is not the only instrument for structural development in Europe; most member states also implement their own policies on a national scale. However, these national policies are often imperfectly aligned with EU cohesion policy – or vice versa.

Fiscal equalisation schemes also play a crucial role in promoting equity. But these schemes fail to serve as proactive tools for structural development. Instead, they function as compensation mechanisms, akin to a “solidarity tax”.

Improved coordination between national and EU policies, alongside effective use of fiscal equalisation, can significantly enhance structural development and cohesion in Europe. Combining resources can boost financial leverage and ease administrative burdens.

Outlook

The current debate on the future of cohesion policy is effectively a search for redefining its identity amid evolving objectives and increasing pressure for rapid results.

Cohesion policy is relevant for mastering global challenges

At first glance, cohesion policy may seem outdated in a changing world. However, regional development remains an overarching issue crucial to addressing global challenges.

Competitiveness. Intensified global competition demands a robust industrial strategy. Cohesion policy’s long-term investments in infrastructure, human capital and innovation are essential for fostering competitiveness across all European regions. In this sense, cohesion policy functions as a long-term industrial policy and promotes economic security.

Green transition. The shift to renewable energy and the broader green transition have varying impacts across regions. A just transition, supported by cohesion policy, is fundamental to achieving Europe’s climate neutrality goals by 2050 and preventing a regional backlash against green policies.

Digital transition. Cohesion policy plays a key role in connecting Europe, fostering collaboration, and driving innovation to address major societal challenges. In an enlarged EU, this role becomes even more critical, offering new perspectives and opportunities.

Thus, cohesion policy is essential to helping Europe tackle the grand challenges of our time by fostering economic, social and territorial resilience. It addresses the fears of economic deprivation across Europe, ensuring no one is left behind. Cohesion policy is crucial for addressing existing and emerging regional disparities, ensuring that all regions and people benefit from European policies. Without this, embracing the European project wholeheartedly is at risk, leading to what has been termed the “geography of discontent”.

Future directions for cohesion policy

The future of cohesion policy stands at a pivotal juncture. As the EU faces new policy priorities, an evolving global landscape and the prospect of further enlargement, refining and enhancing it is imperative. Current outcomes indicate that cohesion policy is not yet fully delivering on its promises, highlighting the need for substantial reform. Key areas of focus include its mission, financing, optimal policy design and synergies with other policies.

The ongoing debate on cohesion policy and forthcoming decisions by policymakers, including negotiations surrounding the MFF, will be crucial in shaping the way forward. The principle of cohesion should remain a central tenet of the EU’s growth and integration strategy, as it is a prerequisite for mastering the challenges of our time.

References

- Bachtler, J. (2022). Cohesion policy – Where has it come from? Where is it going? *European Court of Auditors Journal*, 1, 7–12.
- Bachtler, J., & Mendez, C. (2020). Cohesion Policy. In H. Wallace, M. A. Pollack, C. Roederer-Rynning, & A. R. Young (Eds.), *Policy-Making in the European Union* (8th ed.), Oxford University Press. <https://doi.org/10.1093/hepl/9780198807605.003.0010>
- Bachtröglger-Unger, J., Balland, P.-A., Boschma, R., & Schwab, T. (2023). *Technological capabilities and the twin transition in Europe – Opportunities for regional collaboration and economic cohesion*. Bertelsmann Stiftung.
- Benford, J. (2023). *Cohesion Policy’s Blind Spot – Strong Regional Institutions are Crucial to Implementing Effective Growth Strategies on the Ground*. *Global & European Dynamics*. <https://globaleurope.eu/europes-future/cohesion-policys-blind-spot-strong-regional-institutions-are-crucial-to-implementing-effective-growth-strategies-on-the-ground/>
- Calipel, C., Bizien, A., & Pellerin-Carlin, T. (2024). *European Climate Investment Deficit report – An investment pathway for Europe’s future*. Institute for Climate Economics (I4CE). https://www.i4ce.org/wp-content/uploads/2024/02/European-Climate-Investment-Deficit-report-An-investment-pathway-for-Europe-future_V1.pdf
- Cappellano, F., Molica, F., & Makkonen, T. (2024). Missions and Cohesion Policy – is there a match? *Science and Public Policy*, 51(3), 360–374.
- Cecchi, M. (2023). A Comparative Analysis of the European Recovery and Resilience Facility and Cohesion Policy – Lessons Learned and the Way Forward. *Astrid Ressagna*, 16. <https://www.astrid-online.it/static/upload/8a4f/8a4f9b1bfb57ae3b09d8310823c35795.pdf>
- Dall’Erba, S., & Fang, F. (2015). Meta-analysis of the impact of European Union Structural Funds on regional growth. *Regional Studies*, 51(6), 822–832.
- Diemer, A., Iammarino, S., Rodríguez-Pose, A., & Storper, M. (2022). The Regional Development Trap in Europe. *Economic Geography*, 98(5), 487–509.
- Eurofound. (2023). *Bridging the rural-urban divide: Addressing inequalities and empowering communities*. Publications Office of the European Union. <https://www.eurofound.europa.eu/en/publications/2023/bridging-rural-urban-divide-addressing-inequalities-and-empowering-communities>
- European Commission. (2009). *Knowledge for growth – Prospects for science, technology and innovation*. Directorate-General for Research and Innovation. Publications Office of the European Union.
- European Commission. (2021a). *The EU’s 2021-2027 long-term budget and NextGenerationEU – Facts and figures*. Directorate-General for Budget. Publications Office of the European Union.

- European Commission. (2021b). *Communication from the Commission to the European Parliament and the Council on a new funding strategy to finance NextGenerationEU*. https://commission.europa.eu/document/download/a42a05ab-e656-4cf4-9d0b-b4d2825618ee_en?filename=com2021_250_en_act_part1_v3.pdf
- European Commission. (2022). *Commission welcomes political agreement on REPowerEU under the Recovery and Resilience Facility* [Press Release]. https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7717
- European Commission. (2023). *2023 Strategic Foresight Report – Sustainability and people's wellbeing at the heart of Europe's Open Strategic Autonomy*.
- European Commission. (2024a). *Forging a sustainable future together – Cohesion for a competitive and inclusive Europe – Report of the High-Level Group on the Future of Cohesion Policy*. Directorate-General for Regional and Urban Policy. Publications Office of the European Union.
- European Commission. (2024b). *Ninth report on economic, social and territorial cohesion*. Publication Office of the European Union.
- European Committee of the Regions. (2024). *Implementation of the Recovery and Resilience Facility at Local and Regional Level Results of the CoR-CEMR targeted consultation*. <https://cor.europa.eu/en/news/Documents/RRF-consultation-2024%20final.pdf>
- European Council. (2024). *Mid-term revision of the EU long-term budget 2021-2027*. <https://www.consilium.europa.eu/en/policies/eu-long-term-budget/mid-term-revision-of-the-eu-long-term-budget-2021-2027>
- European Court of Auditors. (2023). *EU financing through cohesion policy and the Recovery and Resilience Facility – A comparative analysis*. https://www.eca.europa.eu/Lists/ECADocuments/RW23_01/RW_RFF_and_Cohesion_funds_EN.pdf
- European Investment Bank. (2023). *Cohesion and regional development – Overview*. https://www.eib.org/attachments/lucalli/20230145_cohesion_and_regional_development_overview_2023_en.pdf
- European Parliament. (2013). *The (low) absorption of EU Structural Funds* [Library Briefing]. [https://www.europarl.europa.eu/RegData/bibliotheque/briefing/2013/130544/LDM_BRI\(2013\)130544_REV1_EN.pdf](https://www.europarl.europa.eu/RegData/bibliotheque/briefing/2013/130544/LDM_BRI(2013)130544_REV1_EN.pdf)
- European Parliament Research Service. (2021). *Cohesion policy and climate change* [Fact Sheet]. [https://www.europarl.europa.eu/RegData/etudes/ATAG/2021/690514/EPRS_ATA\(2021\)690514_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/ATAG/2021/690514/EPRS_ATA(2021)690514_EN.pdf)
- Gerland, C., & Schwab, T. (2022). *Upward Convergence? The History of EU Cohesion. Global & European Dynamics*. <https://globaleurope.eu/europes-future/upward-convergence-the-history-of-eu-cohesion/>
- Hunter, A. (2024). *An EU era of heightened security: What role for the future of Cohesion Policy?* In *Discussion Paper Europe's Political economy programme*. <https://epc.eu/content/Alison-Hunter-Cohesion-Future-Heightened-Security.pdf>
- Idczak, P., Musiałkowska, I., & Kociuba, D. (2024). *The origins of the EU Cohesion Policy – from regional economic development to the place-based approach*. In N. Dotti, I. Musiałkowska, S. De Gregorio Hurtado & J. Walczyk (eds.), *EU Cohesion Policy* (pp. 10–29).
- Jouen, M. (2017, 3 March). *La future politique de cohésion doit symboliser la solidarité européenne en action*. Warsaw Conference The future of Cohesion Policy post-2020, co-organised by the European Committee of the Regions and the Region of Mazovia. <https://institutdelors.eu/en/publications/the-future-cohesion-policy-should-represent-eu-solidarity-in-action/>
- Kopiński, D., Lubasiński, J., Michalski, B., Pilszyk, M., Świącicki, I., & Wąsiński, M. (2024). *The Big Bang Enlargement – 20 Years of Central Europe's Membership in the EU*. Polish Economic Institute. https://pie.net.pl/wp-content/uploads/2024/04/The-Big-Bang-Enlargement_20-years-of-Central-Europes-membership-in-the-EU.pdf
- Lang, V., Redeker, N., & Bischof, D. (2022, 3 August). *Place-Based Policies and Inequality Within Regions* [OSF Preprints].
- Letta, E. (2024). *Much more than a Market – Speed, Security, Solidarity – Empowering the Single Market to deliver a sustainable future and prosperity for all EU Citizens*.
- Lindner, J., Nguyen, T., & Hansum, R. (2023). *What does it cost? Financial implications of the next enlargement*. https://www.delorscentre.eu/fileadmin/2_Research/1_About_our_research/2_Research_centres/6_Jacques_Delors_Centre/Publications/20231213_LindnerNguyenHansum_Enlargement.pdf
- Marzinotto, B. (2012). *The growth effects of EU cohesion policy – a meta-analysis*. *Bruegel working paper*. <https://www.bruegel.org/working-paper/growth-effects-eu-cohesion-policy-meta-analysis>
- Maucorps, A., Römisch, R., Schwab, T., & Vujanovic, N. (2023). *The Impact of the Green and Digital Transition on Regional Cohesion in Europe*. *Intereconomics*, 58(2), 102–110. <https://www.intereconomics.eu/contents/year/2023/number/2/article/the-impact-of-the-green-and-digital-transition-on-regional-cohesion-in-europe.html>
- Núñez Ferrer, J., Schreiber, M., & Moreno, G. (2024). *Furthering cohesion in an enlarged Europe – Impacts of enlargement on regional Cohesion Policy allocations*. <https://cpmr.org/wpdm-package/cpmr-study-impacts-of-enlargement-on-cohesion-policy-and-the-eu-regions-april-2024/?wpdmid=37681&ind=1712648197999>
- Núñez Ferrer, J., & Ruiz de la Ossa, T. (2022). *Administrative capacity risk considerably reducing actual investments under cohesion policy and NGEU/RRF*. *European Court of Auditors Journal*, 1, 118–124.
- OECD. (2020). *Strengthening Governance of EU Funds under Cohesion Policy – Administrative Capacity Building Roadmaps*.
- Ragnitz, J. (2018). *European Cohesion Policies – The Need for Reform*. *ifo DICE Report*, 16(3).
- Rodríguez-Pose, A., Dijkstra, L., & Poelman, H. (2024). *The Geography of EU Discontent and the Regional Development Trap*. *Economic Geography*, 100(3), 213–245.
- Schwab, T. (2023a, 5 December). *The renewable energy transition can reduce economic disparities in Europe*. *Bertelsmann Stiftung Policy Brief*. <https://www.bertelsmann-stiftung.de/en/publications/publication/did/the-renewable-energy-transition-can-reduce-economic-disparities-in-europe>
- Schwab, T. (2023b, October). *Zukunftstechnologien für mehr Kohäsion in Europa*. *Bertelsmann Stiftung Policy Brief Nachhaltige Soziale Marktwirtschaft*. <https://www.bertelsmann-stiftung.de/de/publikationen/publikation/did/policy-brief-2023-10-zukunftstechnologien-fuer-mehr-kohaesion-in-europa>
- Tarschys, D. (2008). *The Budget Review and the Committee on Budgetary Control: Coping with Multiple Agents and Multiple Goals*. <https://www.europarl.europa.eu/cmsdata/177395/20080701ATT33215EN.pdf>
- Többen, J., Banning, M., Hembach-Stunden, K., Stöver, B., Ulrich, P., & Schwab, T. (2023). *Energising EU Cohesion – Powering up lagging regions in the renewable energy transition*. Bertelsmann.
- von Ehrlich, M. (2024). *The Importance of EU Cohesion Policy for Economic Growth and Convergence*. In *The Future of EU Cohesion – Final report of the research project "Ausrichtung der europäischen Strukturpolitik in der nächsten Förderperiode 2028-2034 aus finanzpolitischer Sicht"* commissioned by the German Federal Ministry of Finance. https://ftp.zew.de/pub/zew-docs/gutachten/EUCohesionPolicyFinal-Report_ZEW2024.pdf
- World Bank. (2018). *Rethinking Lagging Regions: Using Cohesion Policy to Deliver on the Potential of Europe's Regions*. *World Bank Report on the European Union*. <https://thedocs.worldbank.org/en/doc/739811525697535701-0080022018/original/RLRFULLonline20180501.pdf>

Paul Egan, Kieran McQuinn and Conor O'Toole

Credit and House Prices in the Irish Residential Market

Many countries experienced a residential credit bubble prior to the global financial crisis; however, by most criteria, the Irish residential and financial sector witnessed one of the most significant imbalances across contemporary western economies. The Irish property market had experienced a significant increase in activity as the economy was transformed during the Celtic Tiger era. However, hand in hand with the increase in housing demand came a major credit market liberalisation, which resulted in a substantial increase in mortgage credit. This, in turn, additionally fuelled the emerging house price bubble by 2005, resulting in the Irish financial sector being especially vulnerable to the global financial crisis of 2007/08 due to its substantial liabilities in the property market. A period of significant reform in credit availability followed, as evidenced by the adoption of the Central Bank of Ireland of macroprudential rules in early 2016. Now, 17 years after the crisis first impacted the Irish market and given the persistent increase observed in Irish house prices since 2012, it is prudent to examine the interrelationship between credit availability and house price movements to see how the residential and financial markets are evolving. This article uses a recently developed model of the Irish housing and credit sector to assess the contribution of changing credit standards to recent house price developments. The developments in the Irish market offer lessons for other EU member states.

The Irish housing and banking crash of 2008–2012 was one of the most substantial experienced by any western economy. On the heels of the rapidly growing economy from the early 1990s, there was a rapid increase in housing demand and, subsequently, activity levels in the Irish housing market. By 2005, both price and supply levels were rising sharply, and concomitantly mortgage credit levels were also rising significantly (McCarthy & McQuinn, 2017). A number of studies indicated the presence of a

dangerous link between house prices and mortgage credit (Fitzpatrick & McQuinn, 2007), and when the global financial crisis (GFC) emerged in 2007/08, the Irish financial system, which was particularly exposed to the bubble in the residential market, was especially vulnerable. The fortunes of the domestic financial sector and the state were intertwined via the guarantee of the Irish Government of the entire domestic banking sector in October 2008.¹ Subsequently, over the period 2008–2012, the Irish economy and financial sector experienced a profound downturn, culminating in Ireland entering a programme of support in October 2010 with the European Union, the European Central Bank and the International Monetary Fund (collectively known as the “Troika”). The costs of the crisis were substantial in terms of lost economic activity and the erosion of wealth: house prices fell by 54% in nominal terms between 2007 and 2012, net household wealth declined by 40% over the same period while unemployment, which had been averaging just over 4.5% between 2000 and 2007, quickly jumped to nearly 14% by early 2010.

The post-GFC period has been characterised by a significant overhaul of financial regulation at both a national

© The Author(s) 2024. Open Access: This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>).

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

Paul Egan, Economic and Social Research Institute, Dublin, Ireland.

Kieran McQuinn, Economic and Social Research Institute, Dublin, Ireland.

Conor O'Toole, Economic and Social Research Institute, Dublin, Ireland.

¹ For more on the Irish Government guarantee, see Honohan et al. (2010).

and EU level. The Troika specified particular targets for deleveraging in the financial sector while the adoption by the Central Bank of Ireland of macroprudential measures in early 2016 saw upper limits set for loan-to-income and loan-to-value ratios as part of the domestic regulatory framework. However, notwithstanding the contraction in total lending by the Irish financial sector and the adoption of specific macroprudential measures, housing demand, in response to the general economic recovery, has recovered robustly post-2012 in the Irish market. At the same time, housing supply struggled significantly to respond; supply levels, which had averaged some 85,000 units between 2005 and 2007, fell away to just over 4,500 units by 2013 and failed to surpass 20,000 units until 2022. This can be compared with estimates of the structural demand for Irish housing (Bergin & Garcia-Rodriguez, 2020), which suggest that approximately 30,000 units a year are required just to meet the increase in demand due to trends in demography and household formation. Consequently, since 2012, house prices in nominal terms have increased by 126% while rent levels have increased by 108%.

This surge in house prices has given rise to some concern that part of the recent increase in prices may be unsustainable in nature or that it may be fuelled once again by a mortgage credit – house price spiral (OECD, 2017).² Therefore, given the profound difficulties experienced by the Irish financial sector and the related implications for the state, an examination of the interrelationship between mortgage credit and house prices is warranted. In this paper, we use a recently developed model of the Irish housing and financial sector, described in Egan et al. (2022), to characterise Irish house price movements over the period 1980-2023. We pay particular attention to the recent post-GFC recovery in house prices and assess whether changes in the credit market, in and of themselves, have had a significant impact on house prices. This new model resides within COSMO, the core structural model of the Irish economy (see Bergin & Egan, 2022). A significant number of studies have examined Irish house prices over the past 25 years (e.g. Roche, 1999, 2001; McQuinn & O'Reilly, 2008; Kelly & McQuinn, 2014; Cronin & McQuinn, 2021; Egan et al., 2023).

The results of our analysis are sobering and suggest that the credit channel has once again in recent years become somewhat influential in impacting Irish house prices. The loan-to-income ratio on average, within the Irish mortgage market, is now back to multiples previously seen

only at the peak of the Celtic Tiger boom. Results from the econometric application indicate that exogenous movements in credit conditions have become quite notable since 2021 and are consequently now having an impact themselves on house prices. However, one crucial difference between the present and the Celtic Tiger period is that of scale. A significant number of mortgages were issued in the 2005-2007 period when credit conditions were loosened considerably, whereas fewer are available now. Nonetheless, this suggests that there is a growing cohort of mortgage holders in the Irish residential market who are taking out highly leveraged positions. A significant deterioration in economic fundamentals such as reduced income levels or higher mortgage rates could result in these households experiencing some difficulties in repaying their mortgages. At this point, the risk does not appear to be systemic in nature.

While our results are estimated in an Irish context, the implications are also of interest from a broader European perspective. After the global financial crisis of 2008, a number of European housing markets in addition to Ireland experienced significant corrections and a prolonged period of adjustment. Many homeowners in Spain and Greece also found themselves in negative equity with mortgage defaults and foreclosures surging. The recovery in markets was uneven across the continent; while countries like Germany and the Nordic nations saw a steady rebound and even growth in property prices, others struggled with high levels of bad debt and sluggish economic recovery. However, one of the economic legacies of the COVID-19 pandemic observed across countries is an acceleration in house price inflation. According to the IMF's Global House Price Index,³ of the over 60 countries participating in the survey, three-quarters witnessed increases in prices in 2020, with the trend continuing into 2021. Indeed, house prices increased by over 5% for 23 of the 60 countries. On a cross-country basis, house prices have not experienced such a sustained increase since the period preceding the GFC.

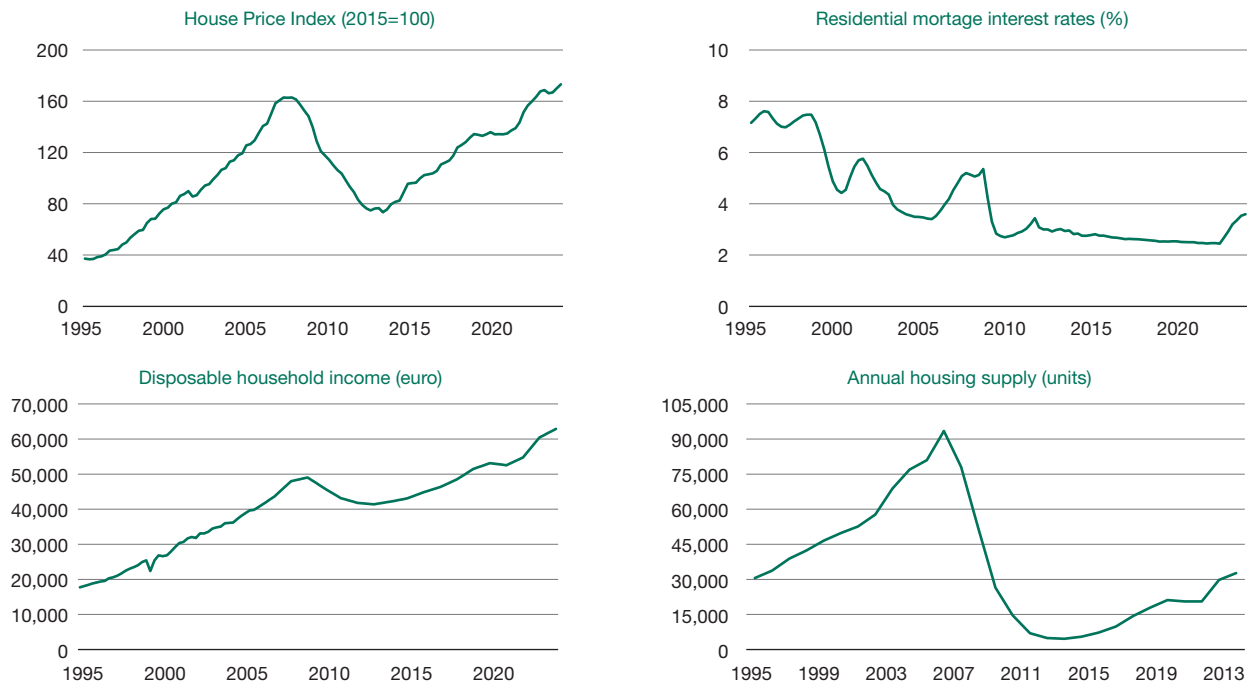
The Irish housing and mortgage market

Figure 1 plots Irish house prices and housing supply levels along with key macroeconomic data such as disposable household income and residential mortgage interest rates from 1995 to 2023. As can be seen, and, as noted by Cronin and McQuinn (2022), house prices over the period can be characterised by three distinct sub-periods: the Celtic Tiger period (1995-2007), the post-GFC period (2008-2012) and the recovery period (2013-2023). Income

² In its economic outlook for Ireland, OECD (2017) noted that "the sharp rise in prices and lending raises concerns that another bubble may be forming, and the authorities should stand ready to tighten prudential regulations if needed".

³ <https://blogs.imf.org/2021/10/18/housing-prices-continue-to-soar-in-many-countries-around-the-world/>.

Figure 1
Irish housing market variables, 1995Q1-2023Q4



Source: Central Statistics Office.

levels followed a broadly similar trajectory, although without the same variability, while interest rates, apart from the 2005-2007 period, followed a distinct downward path. Clearly, the improvement in economic circumstances greatly influenced the increase observed in housing demand.

This combination of macroeconomic factors that influence housing demand can be neatly summarised via the affordability variable introduced by McQuinn and O'Reilly (2008). This approach assumes that the demand for housing is mainly a function of the amount that prospective house purchasers can borrow from financial institutions, and this, in turn, is dependent on current disposable income and the existing mortgage interest rate. The relationship between income levels, interest rates and the typical amount of a mortgage offered by a financial institution is generally based on the present value of an annuity. The annuity is the fraction ϕ of current disposable income pdr_t , which is determined endogenously within COSMO, that goes toward mortgage repayments and is discounted at the current mortgage interest rate, rmt_t for a horizon equal to the term of the mortgage τ . Thus, the amount that can be borrowed $afford_t$ is given by

$$afford_t = \phi pdr_t \left(1 - \frac{(1 + rmt_t)^{-\tau}}{rmt_t} \right) \quad (1)$$

This mimics the reality that people seek to maximise the amount they can borrow subject to the lending criteria of mortgage lending institutions. Figure 2 plots the affordability variable in the Irish mortgage market over the period 1995-2023. The substantial increase in the variable is evident over time, highlighting the role that changes in key fundamental, economic variables played in underpinning the movements in house prices for the period.

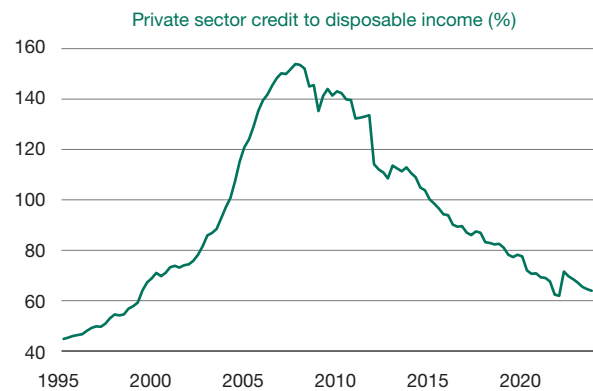
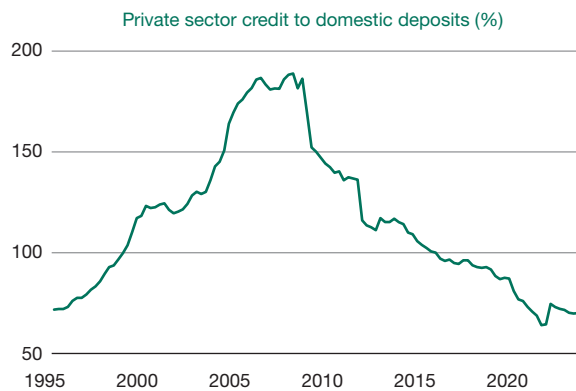
However, it was not just key economic variables that registered significant change over time. Credit conditions and the availability of mortgage credit also witnessed substantial variations over the period 1995-2023. This sharp

Figure 2
Affordability variable in the Irish mortgage market, 1995Q1-2023Q4



Source: Authors' own calculations.

Figure 3
Irish aggregate credit market variables, 1995Q1-2023Q3



Source: Central Bank of Ireland.

rise in credit reflected both deregulation and liberalisation in Ireland (see Kelly & Everett, 2004) and the Irish retail banks being able to access additional funds from abroad following the adoption of the euro. These developments were a feature of European intermediation more generally, with less regulation, financial innovation and cross-border lending occurring at that time (Le Leslé, 2012; McCarthy & McQuinn, 2017). These changes allowed European financial institutions with a surplus of funds to lend to those in deficit. Figure 3 plots two commonly used macroprudential credit measures aimed at capturing the sustainability of financial sector developments: the ratio of domestic credit to domestic deposit and the ratio of the same credit variable to overall economy-wide output.

A consequence of the reliance on overseas funding in Ireland was a rise in the ratio of private sector credit to the domestic retail deposit base, to close to 189% by 2008Q1 (the left-hand side of Figure 3). Using household disposable income as a proxy for overall output (given the well-known issues of using Irish GDP for that purpose),⁴ the right-hand side panel of Figure 3 shows the credit-to-output ratio experiencing a sharp increase through the mid-2000s, reaching a value of 153% in the third quarter of 2007. Both the increase in this ratio and the gap that emerged between retail loans and retail deposits left the Irish economy vulnerable to a change in international financial conditions. When such a change occurred in 2007/08, the vulnerabilities in the Irish financial system led to a steep downturn in economic and housing market performance.⁵ In the post-

GFC period, what is noticeable is that the recovery in the Irish economy occurred alongside little change in the value of outstanding mortgages and an ongoing reduction in the Irish retail banks' loans-to-deposits ratio. The ratio of private sector credit to total household disposable income also continued to decline through the end of 2023.

The specific manner in which increased credit levels impacted the Irish residential mortgage market can be gleaned from Figure 4, which plots the average loan-to-income ratio and the average loan-to-value ratio. McCarthy and McQuinn (2017), availing of detailed bank level loan data, noted the importance of changes in the loan-income ratio in the greater provision of mortgage credit in the Irish market. The figure shows that the ratio of the average loan amount to household disposable income increased to 4.7 in the last quarter of 2006 before falling considerably in the post-GFC era. In addition to regulatory reforms introduced at the EU level, the Central Bank of Ireland introduced its own macroprudential mortgage measures in 2016. These placed specific limits on loan-to-income and loan-to-value ratios in the Irish market. However, notwithstanding the presence of these limits, it is evident that since 2020 the loan-to-income ratio has been increasing somewhat and by the end of 2023 the average loan size was back to a rate of 4.6 times disposable income.

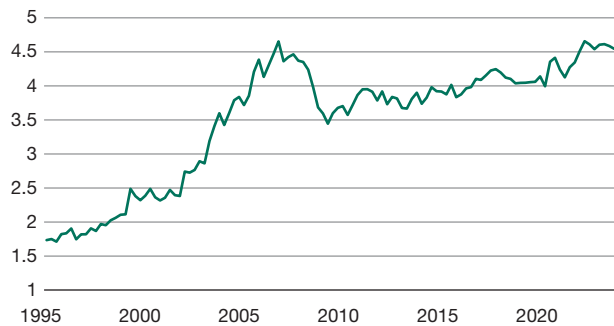
A model of house prices and mortgage credit

In terms of specifying a house price model, we adopt the model outlined in Egan et al. (2022). This is rooted in the standard approach in the literature, where the housing demand function is inverted and rearranged such that the dependent variable is the house price, as opposed to the quantity of housing. Similar applications are found in Peek and Wilcox (1991), Muellbauer and Murphy (1997), Meen (1996), Meen (2000), Cameron et al. (2006), Kelly and McQuinn

⁴ See Lane (2017), FitzGerald (2018, 2020) and Honohan (2021) for more on this.

⁵ Honohan (2010) takes the view that the scale of the Irish banking crisis in 2008 was principally owing to domestic determinants with policy failures on the part of the Irish retail banks and government contributing strongly.

Figure 4
Average loan-income ratio (average loan-to-income multiple), 1995Q1-2023Q4



Source: Authors' own calculations.

(2014) and Cronin and Quinn (2021). The model, which assumes that the demand for housing services is proportional to the housing stock, is usually derived in log-linear fashion. According to this equation, house prices are positively related to real income per capita and are negatively related to the per capita housing stock and the user cost of capital.

Following Egan et al. (2022), we also use the affordability variable outlined in equation (1) above. This is because, as noted in McQuinn and O'Reilly (2008), estimates of the standard inverted demand functions for housing often have a relatively small effect for either the nominal or real interest rate or the user cost of capital. This is a particularly important consideration if the model is to be used for assessing monetary policy simulations. Therefore, the affordability variable is used to capture both the income and interest rate effects together.

The link between house prices and credit has been noted in a wide variety of studies such as Tsatsaronis and Zhu (2004), Goodhart and Hofmann (2008), Cerutti et al. (2017), Duca et al. (2021) and in Irish-based approaches such as Kelly et al. (2011), McCarthy and McQuinn (2017), and Cronin and Quinn (2021). To allow for the impact of changing credit conditions in the model, we employ the approach in Duca et al. (2011), who address the issue in the US housing market. Namely, we first construct an *adjusted* loan-to-income, lti_t , series for the Irish housing market over the period. This is achieved in the same way as in Duca et al. (2011) by estimating the following regression:

$$lti_t = \beta_0 + \beta_1 \frac{afford_t}{pcd_t} + ltires_t \quad (2)$$

The residuals from the regression, $ltires_t$, can be considered as the exogenous shift in credit conditions in the Irish market, i.e. those changes in credit conditions which

Table 1
Summary of main variables used in the analysis, 1980Q1-2023Q4

Variable	Mean	Std. error	Minimum	Maximum
hp_t	€188,804	€112,843	€38,230	€400,165
lti_t	2.91	1.09	1.62	4.66
pcd_t	0.781	0.255	0.241	1.246
$afford_t$	€148,021	€107,210	€11,016	€330,042
$pop2544_t$	1,165,154	227,117	802,125	1,451,825
$tpop_t$	4,069,704	571,043	3,394,850	5,257,200
rmt_t	6.83	4.31	2.45	16.43
cap_t	1,845,117	156,293	1,650,000	2,056,924
pdr_t	€31,732	€17,341	€5,593	€62,286

Note: lti_t is measured in actual multiples, pcd_t is in index form, $pop2544_t$, $tpop_t$ and cap_t are in actual units and rmt_t is in interest rates.

Source: Authors' own calculations.

are not captured by the endogenous factors contained in $afford_t$. These residuals are then included in the house price equation to allow for the presence of changing credit conditions. The house price model also includes the stock of housing, cap_t , which evolves according to the standard perpetual inventory method:

$$cap_t = cap_{t-1} \times (1 - \psi) + hs_{t-1} \quad (3)$$

where ψ is the rate of obsolescence in the Irish housing market, and hs_t is the level of new dwelling completions. The stock of housing is included to allow for supply-side effects in the house price model and provides a link with the housing supply equation in the broader COSMO framework. The house price equation also includes a demographic variable. The long-run specification can therefore be written as:

$$\frac{hp_t}{pcd_t} = \beta_0 + \beta_1 \frac{afford_t}{pcd_t} + \beta_2 ltires_t + \beta_3 \frac{pop254_t}{tpop_t} + \beta_4 cap_t + \varepsilon_t \quad (4)$$

where $afford$ is the affordability measure outlined in equation (1), $pop2544/tpop$ is the proportion of the population between the ages of 25 and 44, capturing the main house purchasing cohort, and cap is the measure of supply. All monetary variables are deflated by the personal consumption deflator (pcd_t). We would expect all variables to exhibit a positive sign with the exception of the supply of the housing variable.

Results

Table 1 presents summary statistics on all the relevant variables used in the analysis. It is evident that a number of

Table 2
Initial long-run regression results, 1980Q1-2023Q4

Dependent Variable	$\log(lti_t)$		$\log\left(\frac{hp_t}{pcd_t}\right)$	
	Estimate	t-Stat.	Estimate	t-Stat.
Constant	-5.358	-27.093	76.075	-11.489
$\log\left(\frac{afford_t}{pcd_t}\right)$	0.538	-32.181	0.986	-16.309
$\log(lti_{res_t})$			1.390	-13.329
$\log\left(\frac{pop_{2544_t}}{tpop_t}\right)$			1.082	-5.051
$\log(cap_t)$			-5.137	-10.294
\bar{R}^2	0.855		0.885	
DW	0.086		0.191	

Note: N = 176 observations in both cases.

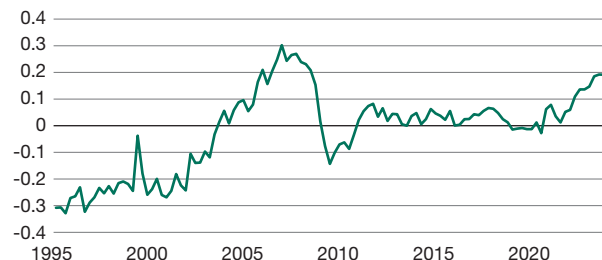
Source: Authors' own calculations.

the variables have witnessed significant variation over the period 1980-2023, particularly given the period of elevated growth in the Irish economy from the early 1990s onwards.

Long-run estimates of the loan-to-income (equation (2)) and house price (equation (4)) models are presented in Table 2. All variables are in logs so the coefficients may be interpreted as elasticities. The results from equation (2) are of particular interest given the importance of changing credit conditions. As is evident from the estimates, changes in key macroeconomic variables such as disposable income and mortgage interest rates, as captured by the affordability variable, have a significant impact on credit conditions. However, what is of particular interest is the role played by the residuals from equation (2), the unexplained change in credit conditions, or the exogenous shift in lending standards.

The results for the residuals are displayed in Figure 5. The substantial shift in credit conditions in the pre-GFC period

Figure 5
Residuals from loan-to-income regression, 1995Q1-2023Q4

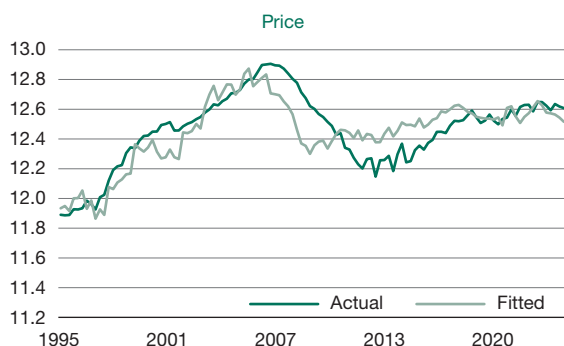


Source: Authors' own calculations.

is evident, with the residuals exceeding 20% from mid-2006 to early 2008. From 2009 onwards, the residuals displayed a significant downward trend and remained practically static between 2011 and 2021. Thereafter, they have increased somewhat through 2022 and 2023, suggesting that there is an exogenous shift in credit conditions over this period. Consequently, a growing portion of the increase in the actual loan-to-income ratio illustrated in Figure 4 from 2021 onwards is not explained by movements in macroeconomic variables such as income levels and interest rates.

The subsequent effect of the change in credit conditions can be observed from the house price model in Table 2; the coefficient on the residuals from the loan-to-income model is a sizeable 1.4. Therefore, a significant increase in exogenously determined credit conditions has a non-trivial effect on house prices. The results for the house price model can be gleaned from Figure 6, which plots both the actual and fitted price from the model (on the left side) as well as the re-

Figure 6
House price model results, 1995Q1-2023Q3



Source: Central Statistics Office and authors' calculations.

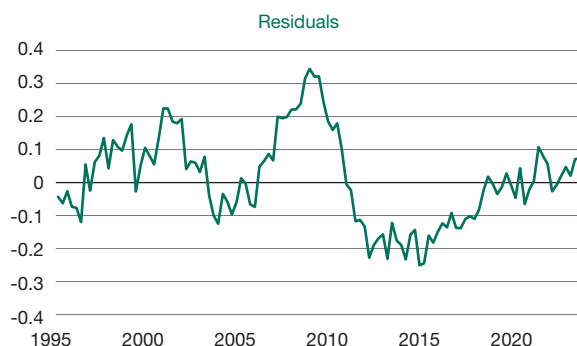
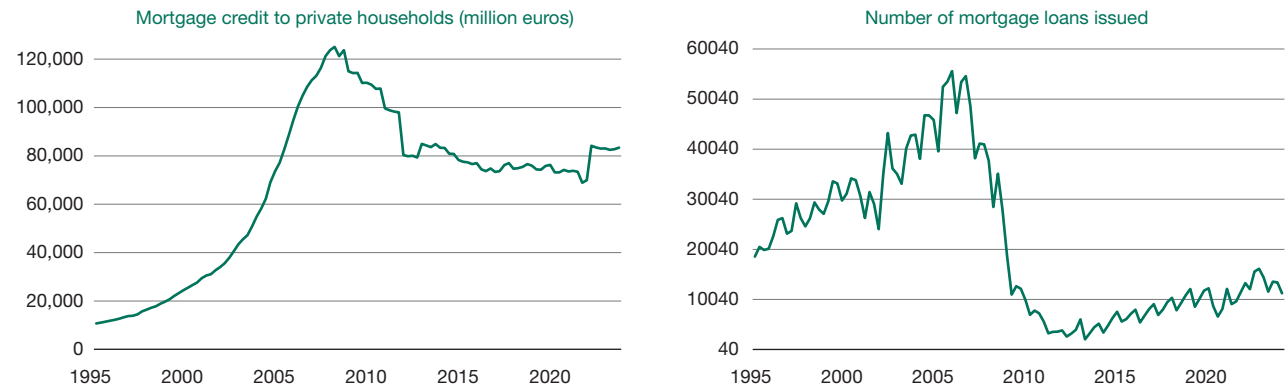


Figure 7
Aggregate mortgage credit market variables, 1995Q1-2023Q3



Source: Central Bank of Ireland.

sulting residuals (right side). From the residuals, it is evident that the recent increase in house prices is somewhat unexplained even when the exogenous shift in credit conditions is allowed for. The scale of the residuals at around 10% is still somewhat less than the 30% at the peak of the Celtic Tiger.

Overall, therefore, the results suggest that some of the recent increases in house prices may be due to an exogenous shift in credit conditions along the lines of what happened in the mid-2000s. This is despite the presence of the Central Bank's macroprudential framework that was introduced in 2016 and has placed specific limits on metrics such as loan-to-income and loan-to-value ratios.

It is important to place the scale of such a development in context. Figure 7, for example, plots both the total stock of mortgage credit issued to Irish households (on the left side) and the number of new mortgages issued (right side). It is clear that the number of mortgages and general level of credit is substantially lower now than what it was at the peak of the Celtic Tiger. However, it is evident that there are a certain number of households in the Irish residential market that have particularly elevated leveraged positions, which renders them especially vulnerable to a sudden sharp economic shock in terms of either income loss or interest rate increases.

In the interests of robustness, an alternative long-run estimator (FM-OLS) was used to estimate the house price regression. The estimated coefficients are broadly the same. For the corresponding short-run regression for the long-run house price model, general-to-specific Hendry (2000) approach is adopted. There is clear evidence of error-correction with the ECM_{t-1} variable having a coefficient value of -0.08. The residuals for the short-run model are, in general, well behaved.⁶

6 For more information, please contact the authors.

Concluding thoughts

The exceptional cost of the intertwined nature of credit conditions and house prices in an Irish context means that the relationship must be consistently evaluated, particularly from a financial stability perspective.⁷ Quite apart from the fiscal cost of the financial crash to the state, the associated impact on households in terms of mortgage arrears and negative equity as well as the knock-on implications for the domestic economy were substantial in nature.

It is evident that much of the increase observed in Irish house prices post-GFC can be attributed to economic factors such as the recovery in the economy or the absence of a significant response from the supply side of the housing market. However, over the past few years, it would appear that changes in credit standards are once again beginning to have an impact on residential prices. This is particularly evident via an exogenous change in lending standards since 2021. These results do suggest that it may have been linked to changes in the credit conditions by the Central Bank of Ireland, which eased its mortgage-based macroprudential measures in 2022. These changes included a movement of maximum loan-to-income ratios for first-time buyers from 3.5 to 4 times income as well as changes allowable to loan-to-value ratios for second and subsequent buyers from 80% to 90%. Enabling prospective house buyers to borrow more at a time when there was considerable savings already built up in the Irish economy due to COVID-19 has almost certainly put upward pressure on house prices.⁸

7 The latest estimated net cost to the Irish state of the bank stabilisation measures is in the region of €41.7 billion (Office of the Comptroller and Auditor General, 2019).

8 Fitzgerald et al., (2021) note that when European consumers were similarly rationed during the Second World War, excess savings were subsequently converted into physical assets in the housing market.

While there is not yet a systemic risk to the domestic financial system, it is important that this trend in changing credit conditions and the resulting impact on house prices be carefully monitored. With actual levels of housing supply in the Irish market somewhat below estimates of the structural demand for housing (Bergin & Garcia-Rodriguez, 2020), it is particularly important that any upward movements in house prices are not additionally fuelled by changes in credit conditions.

Our research has a number of broader implications for other European economies and for the relationship between housing markets and access to credit. Many small open economies like Ireland introduced stringent macroprudential measures into mortgage markets with the aim of breaking the pro-cyclical links between house prices and credit and building resilience in the banking sector. In recent years, the European Systemic Risk Board (2024) has noted that the increase in residential real estate risks in a number of countries due to high levels of household indebtedness. Our research is important as it directly shows the link between rising loan-to-income ratios and house prices and provides further evidence that maintaining strong and stable leverage ratios is important for financial stability. Indeed, the ESRB note that improving housing affordability, likely through supply side measures, is a critical way to break the link between higher leverage and higher house prices. A number of recent studies (OECD, 2021; Frayne et al., 2022) highlight the relatively low level of supply in the European residential market vis-a-vis the level of housing demand. Ensuring that borrower-based measures remain strong and well calibrated will be a critically important aspect of ensuring stable credit markets for other European economies, and, more globally, small open economies.

References

- Bergin, A., & Garcia-Rodriguez, A. (2020). Regional demographics and structural housing demand at a county Level. *Research Series*, ESRI, RS111.
- Egan, P., & Bergin, A. (2023). The impact of government spending on Ireland's housing and residential market – Targeted vs economy-wide stimulus. *Journal of Policy Modeling*, 45(3), 552–569.
- Egan, P., McQuinn, K., & O' Toole, C. (2022). A Revised Financial Satellite Model for COSMO. *ESRI Working Paper*.
- European Systemic Risk Board. (2024). *Follow up Report on the Vulnerabilities in the Residential Real Estate Sector*.
- Cameron, G., Muellbauer, J., & Murphy, A. (2006). Was there a British house price bubble? Evidence from a regional panel. *CEPR Discussion Paper Series*, 5619.
- Cerutti, E., Claessens, S., & Laeven, L. (2015). The use and effectiveness of macroprudential policies: New evidence. *IMF Working Paper*, 15/61.
- Cronin, D., & Quinn, K. M. (2021). "House prices and the credit driven household demand channel: The case of the Irish economy. *Credit and Capital Markets*, 54(2), 199–221.
- Cronin, D., & Quinn, K. M. (2022). Household consumption and the housing net worth channel in Ireland. *Economic and Social Review*, 54(2), 125–147.
- Duca, J. V., Muellbauer, J., & Murphy, A. (2011). Shifting credit standards and the boom and bust in U.S. house prices. Federal Reserve Bank of Dallas. *Working Paper*, 1104.
- Duca, J. V., Muellbauer, J., & A. Murphy. (2021). What Drives House Price Cycles? International Experience and Policy Issues. *Journal of Economic Literature*, 59(3), 773–864.
- FitzGerald, J. (2018). National accounts for a global economy: The case of Ireland. Special Article. *Quarterly Economic Commentary*, Economic and Social Research Institute, Summer.
- FitzGerald, J. (2020). Understanding recent trends in the Irish economy. Special Article. *Quarterly Economic Commentary*, Economic and Social Research Institute, Autumn.
- Fitzgerald J., Kenny S., & Lopez Cermeno, A. (2021). Household behaviour in Ireland, Sweden, the US and the UK under rationing. *Trinity Economics Paper*, tep1221.
- Fitzpatrick T., & McQuinn, K. (2007). House prices and mortgage credit: Empirical evidence for Ireland. *The Manchester School*, 75(1), 82–103.
- Frayne, C., Szczypińska, A., Vašiček, B., & Zeugner, S. (2022). Housing Market Developments in the Euro Area: Focus on Housing Affordability. *European Commission Discussion paper*, 171.
- Hendry, D. F. (2000). Epilogue: The Success of General-to-specific Model Selection. In D. F. Hendry (ed.), *Econometrics: Alchemy or Science? Essays in Econometric Methodology* (pp. 467–490). Oxford University Press.
- Hoffman B., & C. Goodhart (2008). House prices, money, credit and the macroeconomy. *Oxford Review of Economic Policy*, 4(1), 180–205.
- Honohan, P., Donovan, D., Gorecki, P., & Mottiar, R. (2010). The Irish banking crisis: Regulatory and financial stability policy. *MPRA Paper*. University Library of Munich.
- Honohan, P. (2021). Is Ireland really the most prosperous country in Europe? *Central Bank of Ireland Economic Letter Series*, 2021(1).
- Kelly, J., & M. Everett (2004). Financial Liberalisation and Economic Growth in Ireland. *Central Bank of Ireland, Quarterly Bulletin*, Autumn, 91–112.
- Kelly, R., & McQuinn, K. (2014). On the hook for impaired bank lending: Do sovereign-bank interlinkages affect the net cost of a fiscal stimulus? *International Journal of Central Banking*, 10(3), 95–128.
- Kelly, R., McQuinn, K., & Stuart, R. (2011). Exploring the steady-state relationship between credit and GDP for a small open economy: The case of Ireland. *The Economic and Social Review*, 42(4).
- Lane, P. (2017). The treatment of global firms in national accounts. *Central Bank of Ireland Economic Letter Series*, 2017(1).
- Le Leslé, V. (2012). Bank debt in Europe: Are funding models broken? *IMF Working Paper*, 12/299.
- McCarthy, Y., & McQuinn, K. (2017). Credit conditions in a boom-and-bust property market: Insights for macro-prudential policy. *The Quarterly Review of Economics and Finance*, 64, 171–182.
- Meen, G. (1996). Ten propositions in UK housing macroeconomics: An overview of the 1980s and early 1990s. *Urban Studies*, 33(3), 425–444.
- Meen, G. (2000). Housing cycles and efficiency. *Scottish Journal of Political Economy*, 47(2), 114–140.
- Muellbauer, J., & Murphy, A. (1997). Booms and busts in the UK housing market. *Economic Journal*, 107(445), 1701–27.
- OECD. (2017). Economic outlook, 2017(2). https://www.oecd-ilibrary.org/economics/oecd-economic-outlook-volume-2017-issue-2/ireland_eco_outlook-v2017-2-26-en
- OECD. (2021). Brick by brick: Building better housing policies. <https://doi.org/10.1787/b453b043-en>
- O'Reilly G., & K. McQuinn (2008). Assessing the role of income and interest rates in determining house prices. *Economic Modelling*, 25, 377–390.
- Peek, J., & Wilcox, J. A. (1991). The measurement and determinants of single-family house prices. *Real Estate Economics*, 19(3), 353–382.
- Roche M. J. (1999). Irish house prices – will the roof cave in? *The Economic and Social Review, Economic and Social Studies*, 30(4), 343–362.
- Roche M. J. (2001). The rise in house prices in Dublin: Bubble, fad or just fundamentals?. *Economic Modelling*, 18(2), 281–295.
- Tsatsaronis, K., & Zhu, H. (2004, March). What drives housing price dynamics: Cross-country evidence. *Bank of International Settlements Quarterly Review*.

Christian Pfister*

Green ECB Credit: One Step Too Far

Refinancing of green credit by the European Central Bank at favourable conditions has received the backing of some economists and policymakers. The article examines the motives put forward to support this proposal, as well as how it could be implemented and how its proponents try to ward off potential criticisms. A number of the issues raised by the proposal are then discussed from a logical, economic and a legal point of view. The article concludes that adopting the proposed measure would be going one step too far.

There have been recent calls to “green” monetary policy through the refinancing of “green” firms at privileged conditions by the European Central Bank (Colesanti Senni et al., 2023, 2024; Kedward et al., 2022a, 2022b; Monnet & van ’t Klooster, 2023). In France, this proposal has been supported at the head of state level (Macron, 2023) and echoed in columns in the daily newspaper *Le Monde* (van ’t Klooster & Monnet, 2023; Collectif, 2024). In the following, I refer to this proposal as “the proposed measure”.

The proposal

Motives

The motives that are put forward to justify the proposed measure vary from one publication to the other. However, most, but not all, motives relate to the conduct of monetary policy.

Monetary policy motives

From a historical point of view, Colesanti Senni et al. (2023) point out that the targeted longer-term refinancing operations (TLTROs) of the ECB have been successful in supporting the distribution of credit but that the carbon emission intensity of the second tranche of the TLTRO III

programme was high. The instrument would thus be intrinsically good but its design would have to be amended to take climate change into account. However, the authors identify green credit as credit distributed to firms that belong to green sectors and brown credit is distributed to firms in brown sectors. This is an oversimplification that I elaborate on in the second part of this article. Monnet and van ’t Klooster (2023, p. 6) also mention targeted credit policy that favoured exports in Europe in the past. However, they neither evaluate these policies, nor explain why they were in part implemented by central banks, with investment banks or government agencies also contributing in some cases, nor why they were discontinued.

From a geographic point of view, the literature supporting the proposed measures points to various programmes, mostly in Asian emerging economies (China, India, Malaysia, Singapore, South Korea), but also in Japan, involving central bank refinancing at privileged rates under the condition that credit is granted to green projects. However, in most of these economies, the institutional settings differ from those in Europe, with less central bank independence, and less developed and more tightly administered financial markets – differences the proponents of the measure do not mention.¹

From a topical point of view, the need to protect green credit is often related to the high level of interest rates (Colesanti Senni et al., 2024; Monnet & van ’t Klooster, 2023). However, withdrawing the proposed measure when interest rates fall is not suggested.

From a more structural point of view, Monnet and van ’t Klooster (2023) argue, in a slightly paternalistic tone, that “a lack of sufficient green investment is undesirable in

© The Author(s) 2024. Open Access: This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>).

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

* The views expressed are the author’s alone and do not necessarily reflect those of the Orléans Economics Laboratory. The author would like to thank Françoise Drumetz and Pierre Jaillet for their remarks. The author remains solely responsible for any error.

Christian Pfister, University of Orléans, France.

¹ China, for instance, is not necessarily a model to follow, particularly as far as the fight against climate change is concerned. Furthermore, the People’s Bank of China submits all sorts of credit, and not just green credit, to interest rate ceilings and floors.

terms of ensuring long-term price stability” (p. 1). This would call for a “disinflationary credit policy” (Monnet & van ’t Klooster 2023, p. 4), as embodied in the proposed measure. However, this belongs to a non-monetary approach of inflation discussed in the second part of this article. Monnet and van ’t Klooster (2023) also insist that credit policy would be needed because “undifferentiated interest rates are far from neutral” (p. 4). However, neutrality is a myth if it is understood as taking decisions that have the same or very comparable effects on all or most of economic agents and projects, as is seemingly implied by the authors. What central banks refer to regarding neutrality is rather making decisions that do not deliberately aim at having distributive impacts: the reference is thus taken from market allocation, rather than a supposed ideal allocation by a social planner.

Other motives

Another motive relates to financial stability considerations. For instance, Colesanti Senni et al. (2023) state that “[b]y introducing a green TLTRO, the ECB can incentivize banks to lend to green firms and thus induce a transformation in the economy. This ultimately reduces financial stability risks.” However, in contrast to Pfister and Valla (2021), the authors do not explain why such an incentive could not be provided more directly and efficiently by prudential policies.

A more or less explicit motive is that of a market failure. Kedward et al. (2022b) suggest to not just rely on price incentives, but also to direct credit creation in favour of sectors dictated by green industrial strategy, banning any distribution of credit for dirty sectors, defined by a public taxonomy. Again, this approach is in stark contrast with Pfister and Valla (2021), who instead suggest that economic agents should be provided with the right incentives, thus allowing financial markets to play a useful role in allocating saving in line with social welfare.

One last sort of motive is of a legal nature: the ECB would have no choice because, according to Article 127(1) of the Treaty on the Functioning of the European Union (TFEU), “Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Union”.² Among these policies are those aiming at the improvement of the quality of the environment. This point is discussed below.

² The European System of Central Banks (ESCB) comprises the European Central Bank (ECB) and the National Central Banks (NCBs) of the member states participating in the euro area.

Implementation

In the simplest form, as in Colesanti Senni et al. (2023), the ECB would conduct green TLTROs, imposing differentiated interest rates depending on the emission intensity of banks’ loans.

Monnet and van ’t Klooster (2023) propose a more complex arrangement which could include: a credit line provided by the central bank at a concessional rate to a government agency or investment bank distributing green loans accepted as collateral; green refinancing credit at a long maturity (thus very similar to green TLTROs, although the maturity could seemingly be even longer); green asset purchase programmes and green reserve requirements, with differentiated deposit rates based on the volume of green lending by the bank.³

Finally, Kedward et al. (2022a, 2022b) propose a grandiose construction, which would apply to both banks and what they call “institutional capital” (i.e. insurance companies, funds, etc.). It would combine indirect price-based policies, including sector-targeted refinancing lines by the central bank; direct price-based policies, such as interest rate floors and ceilings or subsidised credit to households, SMEs or priority sectors; and direct quantity-based policies, such as portfolio restrictions, credit quotas, large scale public investment through investment banks. In line with their lack of confidence in market adjustments, the authors express a clear preference for direct policies.

Dismissal of potential criticisms

The supporters of a green ECB credit try to present their proposal as compatible with both democracy and the independence of the central bank.

Democracy

A debatable reference to “democracy” is often put forward as a justification of the proposed measure. However, this measure would delegate a distributive role to the central bank, which is not an elected body, at the expense of parliaments and governments, as shown below, with the attending risk of politicising its decision-making process. Monnet and van ’t Klooster (2023) try to solve this issue

³ In the case of differentiated deposit rates, the rates would have to be higher for green banks in order to reward them. However, by increasing the level of market interest rates in the current context of excess liquidity supply, this would be tantamount to a tightening in the monetary policy stance, a point which seemingly escapes the attention of the authors.

through the creation of credit councils.⁴ Kedward et al. (2022b) also suggest that “to ensure the effective design and coordination of green credit policy, new national public agencies comprised of representatives from central banks and relevant financial supervisory bodies and ministries of finance, industry and environment/climate may be needed” (p. 8). In both instances, the body in charge of implementing the policy would basically be an unelected administrative committee, even if some members are parliamentarians, as was the case with the French Conseil National du Cr dit (see footnote 4). This body would mimic the behaviour of a parliament or government, without having the same legitimacy.

Independence of the central bank

Rather euphemistically, Colesanti Senni et al. (2023) state that “since ample existing policies exist on the EU-level concerning the overall orientation of climate policy, there is no need for the ECB to make policy on these topics autonomously” (p. 25), which clearly means, in the context of their paper, that the ECB would merely act as a printing press. Monnet and van ’t Klooster (2023) give the example of the Deutsche Bundesbank giving exemptions to its discount policy in favour of export credit in the 1970s and 1980s as evidence that an independent central bank can implement a credit policy. However, the authors do not put these decisions in the context of the Bundesbank monetary policy framework. In fact, as in almost all other developed economies, the discount rate provided the floor to money market rates, implying that access to the discount window had to be rationed and that the discount rate moved in tandem with the Lombard rate, which was the ceiling to money market rates. The refinancing of export credit was thus not sheltered from interest rate hikes.

Monnet and van ’t Klooster (2023) also mention the Banque de France as an example of a central bank using credit policy in favour of exports, which can be interpreted in two ways. Firstly, there must have been economic pressure on the Bundesbank to do the same, especially in recession periods, since France and Germany are each other’s main economic partner. Secondly, since the Banque de France was made independent only in 1993, this tends to show that the Bundesbank’s independence

4 This proposal is largely inspired by the example of the French Conseil National du Cr dit (CNC). The CNC was a government agency, created in 1945, as a part of an act that also nationalised the Banque de France and the main French banks. It was chaired by the Ministry of Finance and composed of nearly fifty members, most of them being civil servants and representatives of banks and their employees, with five members from the legislative (National Assembly and Senate) and consultative (Economic and Social Council) assemblies. It had a chiefly consultative role, but also had, until 1984, a limited jurisdictional and regulatory power. It was abolished in 2003.

should perhaps not be overrated. To be fair, Monnet and van ’t Klooster (2023) suggest that the creation of credit councils would certainly not fully suppress the independence of the central bank. However, it would curtail the prerogatives of the central bank, which would amount to a partial suppression of its independence. Finally, Kedward et al. (2022a, 2022b) do not even refer to the notion of central bank independence. This makes their approach more consistent than those of the other proponents of the measure, but also more disconnected from reality.

Issues

From a logical point of view

The proponents of the measure implicitly assume that the central bank would have better information on the climate risks incurred by banks than the banks themselves (of course they also implicitly assume that, for some reason, it should not share this information with the banks). However, as Dudi et al. (2021) put it: “In the absence of a consistent definition of environmental sustainability and of a reliable system of verification, it is unclear how to ensure that the fungible funds provided by banks are correctly and effectively used by individual borrowers to finance green projects” (p. 153). In other words, we cannot at the present stage identify what green or brown credit is, a point supporters of the proposed measure do not mention. Furthermore, there is no necessary negative relation between banks’ exposure to brown firms and investment to limit carbon emissions (Pfister and Valla, 2021). In fact, the relation could even be positive, with the more carbon-emitting firms needing to make the largest investments in order to reduce their carbon footprint and thus needing more support from banks.

If the ECB is to subsidise the fight against climate change, should it not also subsidise loans that supposedly create employment and increase productivity, thereby weighing on inflation when it is high, and conversely lower productivity when inflation is low, support diversity and reduce inequalities?⁵ This would transform the central bank into a development bank. To avoid such an outcome, secondary objectives of monetary policy would have to be ranked, which supporters of the proposed measure do not do. Monnet and van ’t Klooster (2023) do suggest such a

5 De facto, Monnet and van ’t Klooster (2023) suggest that “it is desirable to protect some sectors during a tightening cycle because certain types of investment prevent, rather than cause, inflation” (p. 1). In the same vein, Colesanti Senni et al. (2023) suggest that “the ECB could also link its refinancing operations to more targeted programs, such as the May 2022 REPowerEU action plan, which seeks to address the climate-crisis while also ending the EU’s dependence on Russian fossil fuels” (p. 25) as well as “targeted housing and energy programs” (pp. 26-27).

ranking, in which the fight against climate change would come first, as they write: “the failure of central banks to consider the environmental impact of their instruments can undermine the broader role for monetary policy in supporting financial stability, government economic policy, stable employment and other central bank objectives” (p. 1). However, they do not justify this assertion, which thus seems to reflect their own personal judgement. In fact, excluding supposedly brown firms from access to green TLTROs (or for that matter corporate bond purchases) could create a stigma effect. This could lead these firms either to lay off workers or even to default, implying an increase in unemployment, and thus creating a conflict between the two secondary objectives of fighting climate change and supporting full employment.

From an economic point of view

As explained above, especially in the case of Kedward et al. (2002a, 2022b), the proponents of a green credit policy tend to downplay the role of market adjustments.

Furthermore, the proposed measure amounts to a fiscal transfer. Indeed, the same policy could be implemented by government agencies or development banks, which would distribute credit to finance the deserving projects with a subsidy financed by the budget allowing for the lowering of the cost of credit. The costs of this policy would be discussed by the legislature, which would be far more democratic than a discussion in a credit council (see above). The consequences for public finances would also be roughly identical, since the profit made by the ECB is distributed to the member states of the participating countries. It is telling that, in an article on loans distributed in the United States through government-backed direct loan and loan guarantee programmes – most notably from student loan programs Fannie Mae and Freddie Mac, and the Federal Housing Administration – Lucas (2016) refers to “credit policy as fiscal policy”. The proposed measure does not complement government action but rather replaces it. This could also raise a legal issue.

In the case of Monnet and van 't Klooster (2023), as hinted above, the proposed measure is also part of a non-monetary approach to inflation. At least since the first oil shock, now more than half-a-century ago, it has been widely accepted that monetary policy's role is to smooth aggregate demand and that there is little it can do against supply shocks, other than try to avoid a slippage in inflationary expectations, in the form of, e.g. a wage-price spiral. By contrast, within an approach of monetary policy that is reminiscent of the thesis of cost-push inflation in vogue until the early 1970s, the authors refer to credit in favour of green projects as disinflationary credit policy. However,

this is a fallacy: according to the same logic, in the face of a positive wage shock, the authors might as well recommend that the ECB distribute credit to firms at below-market rates to avoid price increases.

The administrative costs of implementing the proposed measures could be very high. They would be incurred at the level of firms, banks and the central bank. These costs would result from the collection of appropriate information, of declaring and processing it, and of controlling both the allocation of credit to genuinely green projects (i.e. projects undertaken by firms which have a credible commitment to net-zero carbon emissions) and the pass-through to borrowers of privileged interest rates. To avoid the gaming of the measure, borrowing firms being granted the funds at privileged conditions would need to be checked in order to ensure that they do not have, nor will they have in the future, other projects that have a detrimental effect on the climate that they finance with other sources of funds. In fact, the administrative costs of implementing the measure could make the distribution of green credit more costly at the social level than that of refinancing banks using standard refinancing operations, thus eliminating the need for the reform and suggesting that other, more efficient ways to fight climate change should be implemented. Increasing the spread with the policy rate to compensate for high administrative costs would in turn increase the risk that banks and borrowing firms capture rents, which could in turn justify stepping up surveillance measures, thereby increasing administrative costs. By contrast, a carbon tax would dispense with the collection of data at the micro level, instead verifying the fulfilment of the commitment to net-zero carbon emissions at the aggregate level of countries, as is currently the case (Pfister & Valla, 2021).

Finally, one can question whether there really is a need for low interest rates to foster the fight against climate change. In the public debate, investment in decarbonisation is often characterised as a supplementary investment (i.e. it does not displace other investments). As a result, this investment is the marginal one, envisaged only when all other (by construction more profitable) investments have been undertaken. Rather paradoxically, this view is also held by the proponents of the measure. However, investment in the fight against climate change would be very beneficial from a social point of view. Consequently, the real issue is to align private interests with the social one. This is the starting point of the thrust of the economic literature on the subject and can be done in the most neutral and efficient manner through the imposition of a social price for carbon, as has been demonstrated a long time ago (Nordhaus, 1977). In line with this approach, banning securities issued by member states that do not

implement policies consistent with the Paris Agreement on climate change from Eurosystem's portfolios, as suggested by Pfister and Valla (2021), would arguably be a much more powerful measure than the proposed one, even though it could be more challenging to implement.

From a legal point of view

To start with, what supporting other EU policies means exactly should be clarified. Is it taking these policies into account when making decisions or serving them directly? Indeed, at the possible cost of oversimplifying, two different approaches to the contribution of all EU institutions to its objectives can be envisaged. The first one is "Napoleonic", with all institutions implementing the policies determined by the centre. The second one relies on checks and balances, with the different institutions not opposing common objectives within their own realm, and contributing directly to them only when this does not infringe on the prerogatives of the other institutions. The proposed measure belongs clearly to the first approach.

It may also create difficulties with so-called monetary financing and conformity with market principles.

In relation to so-called monetary financing, Article 123(1) TFEU states:

Overdraft facilities or any other type of credit facility with the European Central Bank or with the central banks of the Member States (hereinafter referred to as "national central banks") in favour of Union institutions, bodies, offices or agencies, central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of Member States shall be prohibited, as shall the purchase directly from them by the European Central Bank or national central banks of debt instruments.

This seems unrelated to the proposed measure, but the above has shown that green credit policy could very well and more democratically be implemented at the member state level. Thus, should the ECB take on responsibilities that can be assumed by member states, it could be seen as circumventing Article 123(1).

In relation to conformity with market principles, Article 127(1) TFEU states: "The ESCB shall act in accordance with the principles of an open market economy with free competition, favouring an efficient allocation of resources, and in compliance with the principles set out in Article 119". However, Drudi et al. (2021) suggest that potential green TLTROs could raise level playing field issues for participating banks due to their differing ability to obtain

and disclose relevant information as well as cross-country differences. In fact, these operations could also raise level playing field issues for firms that would be expected to benefit from the pass-through of subsidy interest rates granted to the banks having access to TLTROs.

Conclusion

There is a risk that the proposed measure might be well received by central banks, to the extent that the current context might be that of "mission creep" (Cochrane, 2020). The ECB announced on 30 January 2024 its intention to step up climate work with a focus on the green transition, climate and nature-related risks, and to explore the case for further changes to its monetary policy instruments and portfolios in view of this transition (ECB, 2024a). On 13 March 2024, the ECB announced changes to the operational framework for implementing monetary policy, including its intention to introduce new structural longer-term refinancing operations and a structural portfolio of securities (ECB, 2024b). On 27 March 2024, Elderson (2024) recalled that the ECB had in place a methodology to tilt the purchase of corporate bonds (but not that of public bonds) towards issuers with a better climate performance and that it was looking at setting limits on the share of assets issued by entities with a large carbon footprint. He also mentioned that climate change-related considerations would be incorporated into the design of future structural monetary policy operations, without specifying how this could be done.

If the latter measure were to amount to the introduction of green TLTROs, and thus incorporate the provision of liquidity at below-market rates, there would be a risk of a loss of credibility of the central bank. Indeed, the ECB would then interpret its contribution to EU policies in an extensive manner and intervene deliberately in the allocation of resources in the economy. This could be seen as a partial return to practices that were common in a period of high financial repression (Reinhart, 2012), when most central banks were not independent. In turn, this potential loss of credibility could contribute to making the ECB's policies, particularly its monetary policy, less efficient and thus result in a loss of social welfare. In other words, adopting the proposed measure would be going one step too far.

References

- Cochrane, J. H. (2020, 13 November). *Central Banks And Climate: A Case Of Mission Creep*. Hoover Institution.
- Colesanti Senni, C., Pagliari, M. S., & van 't Klooster, J. (2023). The CO₂ content of the TLTRO III scheme and its greening. *DNB Working Paper*, 792.

- Colesanti Senni, C., Pagliari, M. S., & van 't Klooster, J. (2024). Central banks' targeted refinancing operations and the climate transition. *SU-ERF Policy Brief*, 793.
- Collectif. (2024, 2 March). La BCE pourrait appliquer des taux d'intérêt moins élevés au refinancement des prêts bancaires alloués à la transition écologique. *Le Monde*.
- Drudi, F., Holthausen, C., Moench, E., & Weber, P.-F. (2021). Climate change and monetary policy in the euro area. *European Central Bank Occasional Paper*, 271.
- Elderson, F. (2024, 27 March). Taking into account climate and nature in monetary policy and banking supervision around the world. Remarks at an event on climate-related financial risks, hosted by the Central Bank of Brazil.
- European Central Bank. (2024a, 30 January). ECB steps up climate work with focus on green transition, climate and nature-related risks [Press release].
- European Central Bank. (2024b, 13 March). *Changes to the operational framework for implementing monetary policy* [Statement by the Governing Council].
- Kedward, K., Gabor, D., & Ryan-Collins, J. (2022a). Changes to the operational framework for implementing monetary policy. *UCL Working Paper WP*, 2022/11.
- Kedward, K., Gabor, D., & Ryan-Collins, J. (2022b). A modern credit guidance regime for the green transition. *SUERF Policy Note*, 294.
- Lucas D. (2016). Credit Policy as Fiscal Policy, *Brookings Papers on Economic Activity*, 47(1), 1-57.
- Macron, E. (2023, 27 December). The Pillars of Green Wisdom. *Project Syndicate*.
- Monnet, E., & van 't Klooster, J. (2023). Using green credit policy to bring down inflation: what central bankers can learn from history. *Inspire Policy Briefing Paper*, 13.
- Nordhaus, W. D. (1977). Economic Growth and Climate. *American Economic Review*, 67(1), 341-346.
- Pfister, C., & Valla, N. (2021). Financial Stability Is Easier to Green Than Monetary Policy. *Intereconomics*, 56(3), 154-159. <https://www.intereconomics.eu/contents/year/2021/number/3/article/financial-stability-is-easier-to-green-than-monetary-policy.html>
- Reinhart, C. (2012). The Return of Financial Repression, *Banque de France. Financial Stability Review*, 16, 37-48.
- Van 't Klooster, J., & Monnet, E. (2023, 11 September). La Banque centrale européenne pourrait accompagner la hausse des taux d'un taux spécial pour le financement des investissements favorables à l'environnement. *Le Monde*.

OLECON: SUSTAINABLE FINANCING FOR YOUR MAGAZINE

OLEcon, an initiative of the ZBW – Leibniz Information Centre for Economics, is committed to non-commercial Diamond Open Access in economics.

What does that mean?

- No fees for authors (article fees or APCs).
- No fees for readers (no paywall).

OLEcon offers support in setting up sustainable alternative funding for your journal by involving a consortium of libraries.

OLECON.ZBW.EU/EN

ZBW Leibniz-Informationszentrum
Wirtschaft
Leibniz Information Centre
for Economics

How the US Dollar's Dominance Negates Fears About Debt and Deficits

The 2024 presidential election presents Americans with perhaps the starkest choice in our entire political history. On the one hand, Kamala Harris and the Democratic Party are running on a platform reflecting their position as a normal, pro-democracy, center-left political party. Although the Vice President has staked out some modest policy differences with Joe Biden (e.g. her trade policy seems likely to be a bit less protectionist than that of her current boss), her domestic and foreign policy positions clearly signal that a Harris presidency would effectively be a second Biden (or a fourth Obama) administration in policy, tone and governance.

On the other hand, Donald Trump and the Republican Party have now crossed one Rubicon after another, embracing levels of authoritarianism, racism, anti-Semitism and xenophobia once thought to be beyond the pale of modern political discourse. A second Trump administration would push the US further down the road of democratic backsliding, endangering the civil rights of minorities, women and immigrants, and ushering in potentially massive reversals on a range of foreign policy issues, including NATO and Ukraine, Israel-Gaza and US-China relations. Trump's return to the White House would set America on a starkly different path, on both domestic and foreign policy, than it followed under Joe Biden or would under Kamala Harris.

Yet amid these stark differences, the 2024 election also highlights a striking commonality between Democrats and Republicans. On economic policy, despite their many differences, neither party really cares about debt and deficits, even though both regularly claim they are one of America's most urgent problems.

The idea that the federal debt is a looming national crisis has been a near-permanent, bipartisan feature of US politics for decades. It was a central topic of discussion in the 1980s, when debt-to-GDP was 40%; in the 1990s, when it was 60%; and in the 2010s, when it was 100%. Panic about US national debt has returned, now that the debt-to-GDP ratio is 120% and the Congressional Budget Office's latest forecast¹ has it on track to reach 166% by 2054.

To be sure, US debt levels are historically high, surpassing even those during WWII. Yet we continue to borrow in effectively unlimited quantities at historically low interest rates. None of the deficit hawks' dire predictions – hyperinflation, default, capital flight or currency debasement – have come true. Of course, high debt levels may involve real costs (e.g. larger debt payments) and politically sensitive future tradeoffs (e.g. choices between raising taxes and reducing spending). But the idea that the US faces an imminent “sudden stop” fiscal crisis, like developing countries in the 1980s or 1990s, is a category mistake.

So why does the debt remain a central issue in American politics? One answer is that most politicians and voters view government spending through the lens of the “household analogy.” Few beliefs are more widespread in American politics than the belief that the government, like a household, should cut back spending, balance the budget and reduce debt. This was perhaps illustrated most clearly by President Barack Obama during his 2010 State of the Un-

1 The Long-Term Budget Outlook: 2024 to 2054. Congressional Budget Office. <https://www.cbo.gov/publication/59711>

© The Author(s) 2024. Open Access: This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>).

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

Mark Copelovitch, University of Wisconsin, Madison, USA.

ion address, at the height of the Great Recession, when he assured Americans that “families across the country are tightening their belts and making tough decisions. The federal government should do the same.”

The household analogy “feels” right and responsible. But sovereign debt is not a morality play, and we have known since the time of Keynes and the Great Depression that this is exactly the wrong way to think about fiscal policy, especially during crises. Households do not live forever. They cannot tax their neighbors, or issue bonds due decades from now. They do not issue their own currencies. And they do not (as the US does, given that the Federal Reserve and private American investors hold two-thirds of US Treasuries) owe most of their debt to themselves.

A second answer is that pretending to be a fiscal hawk is good politics. Americans regularly tell pollsters they are deeply concerned about debt and deficits, even as they also overwhelmingly favor increased spending on nearly everything in the federal budget. And voters have repeatedly rewarded the politicians responsible for the massive tax cuts and large spending increases that are the main drivers of the debt. Consequently, it is not surprising that both parties love to claim concerns about the debt and offer promises of reducing it without imposing any real costs – either tax increases or budget cuts – on the public. Indeed, we are seeing this once again in the 2024 campaign. Kamala Harris has reiterated Joe Biden’s promise not to raise taxes on those earning less than \$400,000, while Donald Trump promises further massive tax cuts, in line with Republican policies popular since the Reagan era. Neither of these positions is consistent with sincere philosophical concerns about debt and deficits, nor will they reduce America’s debt levels over the next four or eight years.

However, a deeper and more convincing answer is that neither Democrats nor Republicans act as if they were sincerely concerned about debt because it simply is not a major concern for the country issuing the world’s dominant international currency. The dollar remains king not only because of the size of the US economy, but because of America’s unparalleled deep, liquid private financial markets, international investors’ almost insatiable demand for “safe assets” in an era of unprecedentedly large global financial flows, the US government’s willingness to act as the lender of last resort in global crises, and the fact that neither the euro nor the renminbi are remotely likely to challenge the dollar anytime soon, if ever, for global dominance.

The truth is that dollar hegemony enables the US to finance itself with fewer constraints than any other country in the world. There is surely some level of debt that would be such a hard constraint, but we are nowhere near it now, and the idea that we are is an entirely political argument, not serious macroeconomics. Indeed, the very idea that US debt is “unsustainable” or at crisis levels is a category error. Japan has a debt-to-GDP ratio of 250% – more than twice that of the US – and borrows at lower interest rates. If the country issuing the world’s third international currency can sustain these numbers for decades, why do we fret over America’s ability to sustain a level less than half of that? This, of course, is not to say that we should abandon responsible fiscal policy, or that the future may eventually be different. It is merely to point out that the actual fiscal constraint for the US is not even visible on the horizon.

Ultimately, politicians respond to incentives, and both Democrats and Republicans are doing so once again in the 2024 election, using debt and deficits as political cudgels and girding themselves in the robes of fiscal responsibility by making vague but unserious promises to do something about them. The dollar’s unchallenged and overwhelming dominance in the global economy gives us this luxury. America’s real “exorbitant privilege,” to borrow the famous phrase of former French President Valéry Giscard d’Estaing, is the ability to make arguing about debt and deficits our national pastime without ever having to really face their consequences. Given the lack of any serious challenger to the dollar on the horizon, we are almost certain to keep doing this for decades to come, regardless of who wins the White House in November.

Intereconomics

Review of European Economic Policy

Issued by

ZBW – Leibniz Information Centre for Economics
CEPS – Centre for European Policy Studies

Editorial Board

Nicole Waidlein, ZBW Editor-in-Chief
Ekaterina Sprenger, ZBW Deputy Editor-in-Chief
Jiffer Bourguignon, ZBW Editor
Frauke Warmbier, ZBW Editor
Cinzia Alciadi, CEPS Editor

Website: intereconomics.eu

Twitter: twitter.com/Intereconomics_

Address of ZBW Editors

Neuer Jungfernstieg 21, 20354 Hamburg, Germany
Phone: +49-40-42834-303
Email: redaktion@zbw-workspace.eu

Address of CEPS Editor

Place du Congrès 1, 1000 Brussels, Belgium

Advisory Board

Eileen Appelbaum, Center for Economic Policy and Research, Washington, USA

Ulrich Blum, University of Halle, Germany

Ralf Boscheck, International Institute for Management Development, Lausanne, Switzerland

László Csaba, Central European University, Budapest, Hungary

Robert Czudaj, Technical University Bergakademie Freiberg, Germany

Sylvester Eijffinger, Tilburg University, The Netherlands

Daniel Gros, Bocconi University, Milan, Italy

Carsten Hefeker, University of Siegen, Germany

Arne Heise, University of Hamburg, Germany

Wim Kösters, Ruhr-Universität Bochum, Germany

Phedon Nicolaides, Maastricht University, The Netherlands

Jacques Pelkmans, Centre for European Policy Studies, Brussels, Belgium

Ronald Schettkat, University of Wuppertal, Germany

Gunther Tichy, Austrian Institute of Economic Research, Vienna, Austria

1 Copyright

Intereconomics is published Open Access with Sciendo (De Gruyter Group).

© Authors of articles published in *Intereconomics* retain the copyright of their articles and are free to reproduce and disseminate their work (for further details, see the copyright and license agreement). All articles published are distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, sharing, adaptation, distribution, and reproduction in any medium, as long as appropriate credit to the original author(s) and the source is given, a link to the Creative Commons license is provided, and any changes made are indicated. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

Abstracted/Indexed in:

SCOPUS, EBSCO EconLit with Full Text, Google Scholar, ABS Academic Journal Quality Guide, CAB Abstracts, CNKI, Current Abstracts, Directory of Open Access Journals (DOAJ), EBSCO Business Source, EBSCO Discovery Service, EBSCO TOC Premier, ECONIS, European Sources Online (ESO), Gale, Gale Academic OneFile, GeoRef, International Bibliography of Book Reviews (IBR), International Bibliography of Periodical Literature (IBZ), OCLC, PAIS International, ProQuest – Summon, ProQuest ABI/INFORM, ProQuest Business Premium Collection, ProQuest Central, ProQuest Military Database, ProQuest Pharma Collection, ProQuest Politics Collection, ProQuest SciTech Premium Collection, ProQuest SIRS, ProQuest Social Science Collection, ProQuest Technology Collection, Research Papers in Economics (RePEc), World Affairs Online

ISSN 1613-964X (electronic edition) 0020-5346 (print edition)

2 Electronic edition

An electronic edition of this journal is available at:

Intereconomics: intereconomics.eu/
Sciendo: <https://sciendo.com/journal/ie>

3 Print subscription

Editorial Board *Intereconomics*
ZBW – Leibniz Information Centre for Economics
Neuer Jungfernstieg 21
20354 Hamburg, Germany

Phone: +49 431 8814-332
Email: redaktion@zbw-workspace.eu

Subscription rates

Subscription is free of charge if mailing address is within Europe.

Back volumes

Single issues are available on request.

For full subscription information, visit intereconomics.eu/order.html

Printer

QUBUS media GmbH
30457 Hannover, Germany
Printed in Germany, on acid-free paper

Officially cited as: *Intereconomics*

