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United We Transform, Divided We Fall!

A Proposal for an EU Synthesis of Ordoliberal and New Industrial Policies

Anselm Küsters, Patrick Stockebrandt, André Wolf

In the coming years, Europe must recalibrate its economic model in light of decarbonization and digitalization challenges, while striving to remain competitive in a world of increased economic and geopolitical rivalry. To face this unprecedented task, innovation must not be limited to the technological sphere but should also involve new policy answers which transcend traditional lines of thinking. The current transition phase provides a unique window of opportunity for the EU to develop the foundations of a new common "transformation policy" beyond piecemeal interventions. This cepInput sets out the underlying historical and future conditions for such an approach and develops general principles to guide policymakers.

Key Propositions:

- Neither the US nor China can be considered appropriate role models for a European transformation policy. Instead, EU policymakers should take inspiration from the diverse lines of economic policymaking in post-war Europe, which could potentially provide a synthesis of market-oriented regulation (*Ordnungspolitik*) and sector-oriented, well-informed industrial policy (new industrial policy).
- Success will require European policymakers, in the transition phase, to align all policy instruments with a long-term perspective on competitiveness, in order to discover and exploit potential for new comparative advantage arising from intense stakeholder cooperation, while ensuring that checks and balances are in place to cushion the risk of new market concentration and excessive public risk-taking.
- In general, a successful transformation policy should at least comply with the following five minimum principles: rule-bound consistency, market-based longtermism, contestability, proportionality, and transparency/accountability. These principles can collectively mitigate the credibility problem and ensure that the chosen policies align well with the ideas and motivations of both *Ordnungspolitik* and new industrial policy.

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1 Motivation

The overlapping of multiple disruptive long-term trends, first and foremost climate change and digitalization, poses a massive challenge to the established business models of European industries. An intuitive, and historically often observable, response to fundamental challenges is the triggering of innovation processes. Since the ongoing change is of a fundamental social nature, such an impetus will not be limited to the technological level. New concepts are also needed at the political level as a response to novel regulatory issues, without throwing established insights from past policy experience overboard. The US as well as the Chinese model looks superior to the European in terms of speed and determination but neither are compatible with the institutional settings and experiences of the EU countries. What is needed is a smart synthesis of innovative tailor-made incentive instruments and proven policy recipes for the current transition period. Where else but in Europe, with its great and diverse intellectual traditions, could such a synthesis be developed?

In the European Union (EU), the issue of targeted industrial policy is deeply connected with the legal and economic concept of state aid, defined as "any aid granted by an EU country […] which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods" and "affects trade between EU countries".[1] State aid can significantly disrupt competition through various means, such as subsidizing new market entrants or propping up underperforming firms, leading to adverse impacts on their competitors such as loss of market share, reduced profits, and diminished investment prospects (so-called crowding-out effect). As a consequence, societal resource use is distorted, harming aggregate productivity and weakening the innovative forces of competition.

While state aid is therefore banned by EU competition law in general, there are also certain exceptions and the Commission has repeatedly declared certain categories of aid to be compliant with the common market, typically related to "smart, sustainable, and inclusive growth".[2] In this context, recent econometric findings, which are based on a sample of 27 EU countries over the period 2007–2019, suggest that state aid – if targeted and managed properly – can also boost long-term growth and thus competitiveness.[3] A good example is the current trend towards "green industrial policy" directed at environmental protection and energy-saving, as this creates the need for new infrastructure and new jobs that could have positive effects on growth and economic sovereignty. Moreover, additional exceptions have recently been made possible as a consequence of the Covid pandemic and the Ukraine war (EU Temporary Framework for State Aid Measures). Finding the right mix between competition-oriented regulation and development-oriented industrial policy as well as mediating between the diverse economic traditions in Europe will be the key issue of this paper – and this depends, as we will argue, on the respective historical context and the pressing economic and political needs of the time.

At the same time, we put particular emphasis on the historical evolution of economic policy-thinking in Germany and France, not just because the economic weight of these two countries will remain key to the establishment of any Pan-European transformation policy, but also because they have (seemingly) represented opposing role models for economic policies in Western Europe since the end

1 Definition of State aid in Article 107(1) of the TFEU.

2 See Commission (2010), Europe 2020 Strategy.

3 Poulou, N., Polemis, M.L., and Oikonomou, A. (2023). The impact of state aid on economic growth: fresh evidence from a panel of 27 EU countries, European Competition Journal, 19(3), 359–379. In addition, and for comparison, see the evidence surveyed below in section 3.3.

of World War II. We start in Section 2 by briefly sketching the current external challenges and pressures the EU is facing, giving rise to the need for a green and digital transformation. Then, in Section 3, we take our analysis to the global level, examining practical transformation policy approaches in the US and China and discussing the theory and evidence of "new industrial policies", a currently increasingly influential school of economic thought. In Section 4, we apply the lessons learned to policy concepts for the EU. We first sketch the disparate developments of economic policies in Germany and France in recent decades, using this as a justification for the need for a joint European policy approach to the current transformation. Then, we briefly point to the legal restrictions and side conditions for an EU industrial policy. Finally, we provide concrete input for developing a united transformation policy merging the strengths of *Ordnungspolitik* and knowledge-based industrial policy by defining the general principles that any sound measure needs to comply with. In this way, we hope to stimulate a real European dialogue on future-oriented economic policy beyond the national clichés and ideological trenches so often encountered in the current policy circle.

2 The challenge: Staying competitive in the green-digital transformation

In the context of the current global landscape, which is rapidly evolving and undergoing tectonic geo-political shifts, Europe finds itself at a critical juncture, grappling with multiple crises and long-term challenges that demand strategic foresight. At the forefront of its transformation agenda lies the imperative to maintain competitiveness and sovereignty amidst the green and digital transformation sweeping across industries and societies. This transformation is characterized, above all, by the urgent need to address pressing issues such as climate change, the integration of digitalisation and Artificial Intelligence, and the complexities arising from the fragmentation of international supply chains. As external transformation pressures mount, Europe's capacity to navigate these three key challenges will undoubtedly shape its future standing in the world economy and its ability to carve out a sustainable and innovative path forward. In sum, all this calls for a new policy approach.

2.1 Climate change

Climate change, most likely driven by anthropogenic greenhouse gas emissions, poses significant challenges for the EU.[4] Europe has experienced warming at double the global average rate since the 1980s. This climate shift manifests itself in various ways, including ecosystem damage, biodiversity loss, desertification, ocean warming and acidification, polar ice melt, and a rise in sea levels, all contributing to extreme weather events like heatwaves, droughts, storms, and floods. The intensity, frequency, duration, and seasonal anomaly of these weather patterns characterize these extreme events, leading to substantial human, economic, and infrastructure damages. Due to its cross-sectoral effects on European industry, climate change poses a challenge that has led to calls for specific forms of green industrial policy.

The EU faces four principal climate change risks identified by the Intergovernmental Panel on Climate Change (IPCC), which are expected to worsen with increased global warming levels: health impairment

[4] This part of the analysis is based on the section "Wachsende Schäden aus dem Klimawandel", written by our cep colleague Götz Reichert, in: CEP/Feri (2023). Quo vadis, Europa? – Am Scheideweg: Globale Herausforderungen, interne Defizite und dringende Handlungsoptionen.

and deaths due to heat and drought, water scarcity, crop losses, and flood-induced damages.[5] In 2022, about 67% of the extreme weather events were floods and storms, accounting for the majority of economic damage and loss of life. Heatwaves, representing approximately 13% of these events, resulted in over 16,000 deaths. Europe's diverse regions experienced various climatic impacts, like consecutive drought years on the Iberian Peninsula and in the Alps and Pyrenees, extensive wildfires, and significant glacial ice loss in the Alps due to a combination of drought and extreme heat.

Addressing these challenges requires a green industrial policy that considers the intricate interconnections within the global climate system and between various spheres like atmosphere, hydrosphere, geosphere, biosphere, and anthroposphere. Climate change can influence every economic sector, most notably energy, where it affects consumption patterns, technology productivity, and infrastructure. These impacts also extend across different spheres and sectors, creating complex interdependencies. For instance, prolonged droughts can significantly reduce agricultural production, affecting food prices and inflation, while also limiting energy production capacities, leading to supply shortages and operational challenges in various industries. Therefore, any effort to mitigate climate change effects, through emission reduction or adaptation measures, must adopt a holistic approach which takes account of these interdependencies, since the direct and indirect consequences of climate change in one region can trigger significant damages in others due to the highly interconnected global economy.

To summarise, there are two key challenges for the EU in terms of climate change. First, the current quest for energy security is challenged by geopolitical vulnerabilities and a heavy reliance on non-renewable energy sources, which might necessitate a forward-looking industrial policy that not only diversifies energy portfolios but also reinforces the strategic autonomy of its member states. Secondly, the imperative of green innovation, which helps to counter climate change, calls for a strategy that accelerates the adoption of sustainable technologies and facilitates the shift towards a circular economy. This twin challenge of energy security and green innovation underscores the need for a nuanced policy mix which balances economic competitiveness with the EU's ambitious climate goals, ensuring a resilient and future-proof, green industrial base.

2.2 Digitalisation and AI

The exponential development of Artificial Intelligence (AI) is already impacting various sectors of the economy and geopolitics. AI's advancement is fuelled by machine learning techniques that allow computers to analyse large sets of data, identify hidden patterns, and draw novel conclusions. This enables modern AI systems to perform tasks, like speech recognition, image processing, and decision-making, rapidly and automatically with extraordinary speed and (above-)human-level skill. For Europe, AI represents a game-changing opportunity as it can combat some of the above-mentioned issues related to climate change, adapt healthcare to demographic changes, and strengthen stressed supply chains. For example, researchers estimate that using AI for environmental applications could generate an economic value of up to $5.2 trillion by 2030 and reduce global greenhouse gas emissions by 4%.[6]

[5] Intergovernmental Panel on Climate Change (2021). Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Summary for Policymakers]. https://www.ipcc.ch/report/ar6/wg1/chapter/summary-for-policymakers/.

[6] Herweijer, C., Combes, B., & Gillham, J. (2019). How AI can enable a Sustainable Future. PwC UK & Microsoft.

The increasing adoption of AI has substantial macroeconomic implications for Europe, with the potential to significantly enhance labour productivity.[7] However, it also presents risks for some sections of the job market.[8]

Driven by these technological and political developments, Europe is now focusing on increasing its digital sovereignty and developing new professional, AI-related roles, for instance related to the metaverse ecosystem.[9] However, despite Europe's aspirations, leading AI systems are still largely developed by American and Chinese undertakings with unparalleled human capital. Data, computing power, talent pools, and institutions are critical determinants of AI leadership, and Europe currently lags in some of these areas compared to the USA and China.[10] In particular, Europe faces a relative disadvantage in the data market, with the USA leading in innovative language technologies concentrated in domestic private companies. China, on the other hand, focuses on state sovereignty and localization of data. Europe is now shifting its view on data, with initiatives like the Data Act and Data Governance Act aiming to minimize the dominance of American and Chinese big tech companies and provide European companies with easier access to data. The EU is also implementing measures to secure a continuous supply of computing power, though it currently lags in both chip manufacturing and supercomputing compared to the USA and China.

Overall, the institutional embedding of AI and the development of norms differ between the USA, China, and Europe in crucial way. As of now, it is unclear which approach will yield the best results in terms of competitiveness and overall welfare gains. The USA has introduced initiatives to regulate AI's ethical use and establish research and development strategies, while China has focused on its national development plan for AI and stringent regulations. Europe is developing its own approach, with a risk-based AI Act and liability directive, aiming to ensure trust in new AI technologies and attract investment and talent. Overall, Europe faces challenges in competing with American and Chinese dominance in AI, but – in the optimistic scenario – its institutional approach with a focus on risk minimisation and strong adherence to ethical guidelines could pave the way for a competitive advantage in the future through strong signalling effects and, ultimately, better datasets and more robust AI applications.

Again, the EU's position can be described as a twin challenge. Just as in other policy fields, the EU's digital policy must aim to ensure strategic sovereignty, which implies reducing dependency on non-EU technological infrastructures. Particularly in the realm of AI, the EU must confront a competitive disadvantage as American and Asian entities dominate the market. This underscores the urgency for a policy framework that not only ensures ethical standards and public trust, as currently planned for in the EU's AI Act, but also fosters AI innovation. Some forms of industrial policy might therefore be indispensable to bolster the technological capabilities and competitive stance of European tech companies as quickly as possible.

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7 Noy, S. and Zhang, W. (2023), Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence, MIT Working Paper (March), Noy_Zhang_1_0.pdf (mit.edu).

8 Eloundou, T., Manning, S., Mishkin, P., and Rock, D. (2023). GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models (arxiv.org).

9 See the action points on people and skills in: Communication COM(2023) 442 of 11 July 2023 for an EU initiative on Web 4.0 and virtual worlds: a head start in the next technological transition; see on this Küsters, A., Kullas, M., Stockebrandt, P. (2023), EU-Metaverse Strategy: WEB 4.0 & Virtual Worlds, cep**PolicyBrief** 14/2023.

10 This part of the analysis is based on: CEP/Feri (2023). Quo vadis, Europa? – Am Scheideweg: Globale Herausforderungen, interne Defizite und dringende Handlungsoptionen.

2.3 Fragmentation of international trade

For a long time, globalization appeared to be an indestructible phenomenon. After the end of the Second World War, the trade intensity of the world economy showed a positive trend which lasted for decades. Economic crises caused only temporary stagnation, and international trade returned to its growth path after only a short time. Since the last global financial crisis, however, this trend has been broken. Trade intensity now seems to oscillate around a fixed plateau. Singular shock events such as the recent CoViD19 pandemic and the Ukraine conflict have undoubtedly played their part, but the causes are also structural. This is evident in the bitterly fought tariff disputes, as in the case of the USA and China[11], but also in the stalemate in multilateral free trade rounds and the continuing blockade of the dispute settlement body of the World Trade Organization (WTO).[12] At the same time, an increase in non-tariff trade restrictions, i.e. trade-restricting measures going beyond tariffs such as import quotas, licensing systems and technical product specifications, is in evidence globally. Based on data from the Global Trade Alert Database, the International Monetary Fund (IMF) has identified a significant increase in such trade-distorting measures globally since 2018.[13] This is partly an expression of growing demands on product quality, safety, and environmental protection. In some cases, however, it is also a means of covertly raising the barriers to market entry for imported products, for example by deliberately complicating approval procedures.[14]

Consequently, the idea of thinking in terms of spheres of influence that originated in foreign and security policy is increasingly being transferred to the economic sphere. This is reflected in an increase in regional free trade agreements. The focus is shifting from tariff reductions to general regulatory convergence. The harmonization of regulations on product approval and environmental protection is intended to create common markets that increase the partners' clout in the international dissemination of standards.[15] Beyond the regulatory sphere, influence can also be exerted by building up a cross-border infrastructure geared to the needs of a country's own economic structure. The best example is China's Belt and Road Initiative, which is almost global in scope.[16] The associated lock-in effects for the partners involved further deepen the rifts between the economic integration areas. In this context, the IMF speaks of a threatening geoeconomic fragmentation.[17]

Taken together, the EU faces pressing challenges in ensuring both the stability and the security of supply chains, a concern accentuated by a recent series of disruptions that underscore the vulnerability of cross-border networks and infrastructure and have led to reductions in trade intensity. Today's interdependence of global suppliers, particularly in critical sectors such as semiconductors and pharmaceuticals, reveals systemic risks that can undermine the economic sovereignty of the EU. This, in turn, has led to calls for a new policy mix in Europe that should encourage regulatory convergence,

11 Plummer, M. G. (2019). The US-China Trade War and Its Implications for Europe. Intereconomics, 54(3), 195–196.
12 Pauwelyn, J. (2019). WTO dispute settlement post 2019: what to expect?. Journal of International Economic Law, 22(3), 297-321.
13 IMF (2022). Regional Economic Outlook for Asia and Pacific. International Monetary Fund, Washington D.C.
14 Niu, Z., Liu, C., Gunessee, S., & Milner, C. (2018). Non-tariff and overall protection: Evidence across countries and over time. Review of World Economics, 154(4), 675–703.
15 Yanase, A., & Kurata, H. (2022). Domestic product standards, harmonization, and free trade agreements. Review of World Economics, 1-31.
16 OECD (2018). The Belt and Road Initiative in the global trade, investment and finance landscape. In OECD, OECD Business and Finance Outlook 2018.
17 IMF (2023). Geoeconomic Fragmentation and the Future of Multilateralism. International Monetary Fund, Washington D.C.

trade clubs, resilient supply networks, and a strengthened internal market to mitigate external dependencies.

3 Lessons from policy experience

3.1 Current policy approaches in the US and China

From the perspective of Europe, as well as of most emerging countries, the economic policies of China and the USA represent a major restriction to the development of a future-oriented policy mix. This is due, on the one hand, to the strong direct links with these countries through trade and direct investment, as well as to the dominance of American and Chinese giants on global markets. On the other hand, it is also due to the strong signal effect emanating from the success and failure of economic policy strategies in these countries. From the perspective of traditional economic policy thinking, the current policy mixes pursued by both countries appear exotic and experimental. Notwithstanding the existing interdependencies, a closer analysis of these real-world experiments can yield crucial learning effects for Europe.

Barry Eichengreen (2023) describes the current economic approach of the Biden administration as a combination of the following elements: a Keynesian expansive fiscal policy, a rigorous internal competition policy, and a geostrategic trade policy.[18] Fiscal policy is based on the idea of a demand-pull effect through increased government spending and tax cuts. However, the goals pursued are not purely growth-oriented, as in economic textbooks. Instead, the idea is to combine the goal of a short-term growth stimulus with the long-term goals of modernizing and transforming the economy. For example, measures such as the Inflation Reduction Act do not simply aim to stimulate investment in general, but rather specifically in sectors and technologies that are necessary for the transition toward a climate-neutral economy.[19] The extensive infrastructure spending is also aimed in this direction.[20] At the same time, Eichengreen (2023) sees distributional motives at work. The demand pull is intended to raise wages and improve employment opportunities specifically for groups with poor access to the labour market. This is intended to increase incentives for education and thus create long-term opportunities for advancement for underprivileged classes in American society. This form of fiscal policy thus attempts to combine growth-related with transformative goals.

At the level of competition policy, Eichengreen (2023) sees a strong anti-trust attitude. This applies to both traditional industry and the digital sector. On the one side, this is expressed in stricter guidelines for mergers and acquisitions.[21] However, according to observers, the monopoly suit filed against Google shows that the efforts in this area go much deeper.[22] It is about altering the general way in which certain businesses and markets work. Competition rules are to be changed in such a way that tendencies to create market power are eliminated, even if this puts limits on the growth of national

[18] Eichengreen, B. (2023). Bidenomics. Intereconomics, 58(4), 227-228.

[19] Larsen, J., King, B., Kolus, H., Dasari, N., Hiltbrand, G., & Herndon, W. (2022). A turning point for US climate progress: assessing the climate and clean energy provisions in the Inflation Reduction Act. Rhodium Group, 12

[20] Kilanko, V. (2021). The potential effects of Biden's infrastructure bill on the American economy. International Journal of Scientific Advances, 2(5).

[21] Portuese, A. (2021). Biden antitrust: The paradox of the new antitrust populism. Geo. Mason L. Rev., 29, 1087.

[22] McKabe, D., Kang, C. (2023). In Its First Monopoly Trial of Modern Internet Era, U.S. Sets Sights on Google. The New York Times, September 12th, 2023.

champions. This progressive US antitrust approach is known as the "New Brandeis Movement".[23] The link between this antitrust policy and the demand pull is the impact on inflation. Only if there is a sustained increase in real wages will the measures retain an expansionary effect. For this, the inflation pressure must be kept in check. Competition policy will contribute to this by eliminating price setting power and thus reducing the opportunities for suppliers to respond to demand increases with higher mark-ups.

In the area of trade policy, there is no clear departure from the "America First" policy pursued by Donald Trump. It is true that the Biden administration is generally demonstrating a greater willingness to cooperate with its traditional allies from Europe, as can be seen, for example, in the talks on a joint raw materials club.[24] However, we seem to be a long way from a serious resumption of deep transatlantic free trade talks as in the days of the Obama administration. At the same time, the will to contain China's increasing global economic dominance remains unabated, as demonstrated by the export ban on technology goods for the chip industry in China,[25] recently extended to an important segment of semiconductors themselves.[26] The pro-competitive view of the national economy is therefore in no way transferred to the area of international economy policy. Instead, the trade policy of the Biden administration is dominated by geostrategic interests rather than committed to the traditional American idea of safeguarding an international division of labour based on cost advantages.

In this sense, the Biden approach ("Bidenomics") can be understood as picking up and combining elements from quite different, sometimes opposing, schools of political and economic thought. It operates within a triangle of Keynesian fiscal policy, ordoliberal promotion of competition and "America First" trade policy, while attempting to steer structural change toward a green future. Whether this heterogeneous mix is actually an expression of a conscious economic strategy, a pragmatic approach to political survival, or simply a cacophony of individual interests is difficult to judge from the outside. In any case, the sheer global investment power of the US implies that this policy twist poses an enormous economic and regulatory challenge to international competitors, which is also reflected in the heated debates which the Inflation Reduction Act has triggered in Europe.[27]

Similarly, scholars and policymakers frequently turn to the case of China when discussing industrial policy in the digital age due to the nation's significant strides during the past decade, illuminating a potentially replicable model of success. China's proactive and strategic government interventions have facilitated the rapid expansion and integration of digital technologies within its industrial sector, as suggested by frequently discussed examples such as electronic vehicles (EVs), AI, and, recently, even chip manufacturing. Through a meticulous amalgamation of protectionist policies, substantial investment in innovation and technology, and the fostering of domestic tech giants like Alibaba and Huawei, China has cultivated a vibrant digital ecosystem that supports its industrial and geopolitical ambitions. Additionally, the "Made in China 2025" initiative exemplifies a robust policy framework aimed at achieving dominance in high-tech industries, underlining the government's commitment to

[23] Khan, L. (2018). The New Brandeis Movement: America's Antimonopoly Debate, Journal of European Competition Law & Practice 9(3), 131–132.

[24] Stewart, E.I. (2023). The EU and US Make a Bid for the World's Critical Raw Materials. Foreign Policy in Focus. October 6st, 2023.

[25] Sheehan, M. (2022). Biden's unprecedented semiconductor bet. Carnegie Endowment for International Peace. October 27th, 2022.

[26] Ton, M., Tausche, K. (2023). US escalates tech battle by cutting China off from AI chips. CNN. October 18th, 2023.

[27] Kleimann, D., Poitiers, N., Sapir, A., Tagliapietra, S., Véron, N., Veugelers, R., & Zettelmeyer, J. (2023). How Europe should answer the US Inflation Reduction Act. Bruegel.

digital industrialization. When discussing lessons for a new type of European industrial policy, one thus needs to consider the Chinese model and ask whether it is indeed providing valuable lessons on the synergies between government policy, industrial development, and digital technology in a global landscape.

However, despite the apparent successes in fostering digital applications, such as EVs and AI-driven super-apps, China is currently facing several post-pandemic challenges, including a property crisis and weak consumer spending.[28] The recent slump in demand for Chinese-made goods in the wake of coronavirus and the ongoing trade dispute with the US casts doubt on whether China's industrial policy approach is indeed a suitable role model for EU policymakers. Indeed, a recently growing body of academic literature suggests that China's industrial policy and economic framework in the digital age is ultimately unsustainable, as evidenced by the flawed execution of financial favour targeting, diminishing productivity, and declining business dynamism, particularly in the private sector.

Firstly, the sub-optimal targeting of financial favours by local officials, driven by short-term career incentives, has been detrimental to the country's growth and transition to the digital economy. Financial supports are disproportionately allocated to loss-making, larger, older, and less productive firms, as noted by the analysis of firm-level data from annual tax surveys in China spanning from 2007 to 2015.[29] This misallocation not only suppresses the entrance of new firms into the market but also inhibits productivity growth. This points to a larger failure common to many industrial policy projects, namely that the distributors of money are incentivized to grant excess financial favours, especially to loss-making entities. Consequently, this practice contributes to market distortions and undermines the process of creative destruction essential for fostering innovation and efficiency in the economy, which is of particular importance in the rapidly evolving digital economy.

Moreover, the post-2007 era witnessed a slowdown in China's productivity growth, accompanied by decreased returns of capital due to robust investments in infrastructure and housing. A lack of resource allocation to productive firms and limited market entry and exit mechanisms have been correlated with slower total factor productivity (TFP) growth in the manufacturing sector.[30] Although earlier reforms initiated a convergence process in productivity between state-owned enterprises (SOEs) and private companies, the momentum was lost as early as 2007. The imperative for achieving China's sustainable growth is to reverse the downward trajectory in TFP growth, which is fundamental for maintaining high growth potential in the long term. However, it is questionable whether this can be achieved purely with industrial policy spending.

The evidence is not favourable in this respect, as the period from 2003 to 2018 saw a marked decline in China's business dynamism, reflected in the falling revenue share of young firms, slowed life-cycle growth of young firms relative to older incumbents, and capital constraints experienced more acutely by smaller and younger firms.[31] The diminished business dynamism is particularly evident in regions where SOEs dominate the capital stock. Data also reveals significant productivity gaps persisting between SOEs and private entities. For China to revive its sluggish TFP growth, it must rejuvenate

[28] China exports fall again as economy struggles - BBC News.

[29] Bulman, D., Yan, X, and Zhang, Q. (2022). Picking Losers: How Career Incentives Undermine Industrial Policy in Chinese Cities, The Journal of Development Studies, 58 (6), 1102–1123.

[30] Brandt, L. et al. (2022). Recent Productivity Trends in China: Evidence from Macro- and Firm-Level Data (jhu.edu), China: An International Journal 20(1), 93–113.

[31] Cerderio, D.A., and Ruane, C. (2022). China's Declining Business Dynamism (imf.org), IMF Working Paper No. 2022/032.

private sector dynamism and would need to implement comprehensive SOE reforms – in short, the type of dynamism required is not something that can be achieved with classic industrial policy but requires more fundamental structural reforms.

In conclusion, China's current model for conducting industrial policy in the digital age is unsustainable due to the short-term incentivization of officials leading to misallocated financial supports, the decline in productivity growth, and the weakening of business dynamism, primarily in the private sector. For China to sustain its growth in the digital era, significant policy adjustments and reforms are imperative, aimed at rectifying the allocation of financial favours, improving productivity, and revitalizing business dynamism. In their attempt to increase European competitiveness, EU policymakers should remember these lessons and focus on enhancing the efficiency and innovative capacities of younger and private firms while ensuring that industrial policy measures do not lead to uncompetitive incumbents ("European champions"), as has happened in the case of Chinese SOEs.

3.2 The recent debate on new industrial policies

In academic circles, the renaissance of state-driven economic development policies has sparked a debate on the theoretical foundations and justification. In recent years, influential economists such as Dani Rodrik[32] and Mariana Mazzucato[33] have laid the foundation for a new way of thinking about industrial policies beyond classic lines of reasoning like infant industries arguments or import substitution goals.

The starting point of their thinking is an institutional-systemic view of the economy, in which macroeconomic growth is seen as the result of a complex interaction process between private and public agents – not unlike the assumptions behind *Ordnungspolitik* and its focus on the interdependencies between the economic, political and legal order. The task of regulators in such a system is not only to eliminate possible sources of market failure, but also to actively shape the underlying conditions for markets and competition in cooperation with private agents. The welfare objective is not simply to maximize income growth. The type of global economic growth observed in recent decades is being critically evaluated in terms of its social and environmental side effects. The basis for this assessment is not the neoclassical concept of negative externalities but the notion of a "common good". This "common good" is defined much more broadly than just the avoidance of non-compensated damages caused by market processes (e.g., negative environmental externalities). It also encompasses the notion of equality of access to productive resources (ex-ante equality) as well as a fair distribution of returns to growth (ex-post equality).[34] On this basis, a targeted form of economic growth ("directionality") striving to simultaneously overcome environmental issues and economic inequality is propagated as the ultimate welfare goal.[35]

[32] Rodrik, D. (2004). Industrial policy for the twenty-first century. John F. Kennedy School of Government Working Paper Series rwp04–047.

[33] Mazzucato, M. (2011). The entrepreneurial state. Soundings 49, 131–143.

[34] Dolderer, J., Felber, C., & Teitscheid, P. (2021). From neoclassical economics to common good economics. Sustainability, 13(4), 2093.

[35] Mazzucato, M., Rodrik, D. (2023). Industrial policy with conditionalities: a taxonomy and sample cases. September 2023 — Working paper WP 2023/07. Institute for Innovation and Public Purpose.

To achieve this goal, proponents of new industrial policies believe that active strategy-building in the form of a clear industrial policy agenda is required on the part of policymakers. A prerequisite for such an endeavour is the endowment of public organizations with sufficient planning capacities.[36] Unlike traditional socialist thinking, however, this is not about maximizing societal control over productive resources or the pursuit of absolute planning sovereignty. Competition and market interaction are recognized as necessary elements of a public welfare-oriented economy. In addition, there is the notion of information asymmetries as a restriction on public agents. From their own experience, private market actors have much better information about technologies, competitive structures, and environmental effects. This industry- and product-specific information is indispensable for the welfare-optimal design of regulation. It is therefore reasonable for the state not to act as an autonomous planner. Instead, the formation of an industrial policy strategy is to be the result of an intensive exchange process between state and private actors.[37] Due to constant technological and institutional change, such strategy formation is necessarily a never-ending evolutionary process.

This exchange has a mutual character. The interaction is conceptualized as a negotiation process based on the ideas of game theory. In this negotiation process, the state offers private entrepreneurs regulatory conditions that promote industrial growth, while the private actors offer the state the necessary information. The goal of the state actors in this process will be to steer it toward the joint development of a policy design that favours public welfare-oriented forms of growth. The fiscal support tools used for this (taxes, subsidies, loans) are not necessarily limited to risk-neutral start-up financing for private investment but can also include the deliberate assumption of entrepreneurial risks by public budgets ("entrepreneurial state"). However, the willingness to accept such public risk will always be linked to case-specific conditions.

Guidelines for this employ the concepts of "Reciprocity" and "Conditionality".[38] Reciprocity means that public risk-taking must never be one-sided: not only realized losses, but also parts of realized profits must be collectivized, be it through direct state participation or indirectly through the tax system. Conditionality means that state support for private companies must be linked to concrete conditions in the form of behavioural commitment. Supported companies are expected to comply with a public welfare-oriented economic approach that promotes the welfare goals described above. Such conditions are not necessarily limited to the means offered by economic incentive policies or industrial self-commitments; the application of binding regulation is also regarded as a legitimate tool.

Another characteristic of the new industrial policies is their emphasis on economic dynamics and the focus of welfare considerations on the long-term perspective. This relates on the one hand to the goal of avoiding irreversible welfare damage (e.g. in the context of climate change), and on the other hand to the focus on innovation as the key to sustainable growth. The concept of innovation is understood holistically, encompassing not only the technological side but also the institutional setting necessary for successful market integration. Successful innovation is thus interpreted as the result of cooperation between private and state actors. In this respect, too, it is claimed to be the task of an industrial policy strategy to guide the direction of private activities through a "mission-oriented" approach.[39] The risk

[36] Mazzucato, M., Kattel, R., & Ryan-Collins, J. (2020). Challenge-driven innovation policy: towards a new policy toolkit. Journal of industry, competition and trade, 20, 421-437.

[37] See Rodrik (2004).

[38] See Mazzucato & Rodrik (2023).

[39] Mazzucato, M. (2018). Mission-oriented innovation policies: challenges and opportunities. Industrial and corporate change, 27(5), 803-815.

that too narrow specifications could hamper the discovery of efficient solutions is recognized by the proponents, who therefore propose a middle course. Instead of concrete technology specifications, instruments of innovation policy should be calibrated to make a contribution to public welfare-oriented growth. The principle of technology openness is thus not completely abandoned but is at least undermined.

In their policy recommendations, these concepts reveal a very different view of addressing market failures than in the neoclassical or ordoliberal schools of thought. The propagated approach does not consist of discrete autonomous interventions by policymakers to resolve specific forms of misallocation (e.g. introducing a carbon price to internalize climate damage), but of the development and application of a coherent "policy package" through a collaboration of state and private actors. From an institutional perspective, this may represent a more accurate conception of real-world policy processes than the notion of an external intervention. At the same time, however, it raises the question of whether such a theory does not de facto legitimize the de-democratization of decision-making processes in the field of economic policies. A necessary ex-post approval of negotiation results by democratically elected parliaments is not a sufficient shield against this danger. After all, a prerequisite for efficient negotiations is that sufficient negotiating scope exists on both sides to reach a satisfying compromise. For this reason, ex ante constraints imposed by parliaments on state negotiators can never be fully comprehensive.

Another strain of criticism that could be levelled against new industrial policy and its recommendations comes from a Hayekian perspective, which became increasingly influential in post-war German economic thought (Section 4.1). As this constitutes a characteristic element of *Ordnungspolitik* to this day,[40] finding common ground in Europe necessitates dealing with it. From the Hayekian perspective, the proposed "mission-oriented" approach to guiding industrial policies, particularly in the sphere of innovation, inherently undermines the concept of competition as a process of discovery.[41] Especially in his later works, Hayek emphasized the spontaneity of market systems, viewing competition as a process that discovers and disseminates diffuse knowledge among individual actors within the market.[42] Accordingly, the direct alignment of private activities by state actors may potentially stifle the organic evolution of market processes that could otherwise create unforeseen opportunities and innovative pathways. Additionally, the policy recommendations of the new industrial policy assume that the state can gain a degree of foresightedness in navigating long-term welfare considerations which is ultimately incompatible with Hayek's scepticism of centralized knowledge and the ability of state actors to effectively coordinate complex economic activities.

To a certain extent, Hayek's general scepticism about the state's level of information vis-à-vis the market is shared by the new industrial policy: it is precisely that constant interaction between regulators and companies which is supposed to facilitate the collection of market and technology information, otherwise only available in a decentralised manner, and make it usable for precisely

[40] Küsters, A. (2023). Ordering ORDO: Capturing the Freiburg School's Post-war Development through a Text Mining Analysis of its Yearbook (1948–2014), Economic History Yearbook 64(1), 55–109.

[41] Maskin, E.S. (2015). Friedrich von Hayek and mechanism design. Rev Austrian Econ 28, 247–252. We note that in addition to Hayek's bottom-up approach, a more top-down approach of "mission-oriented" policies can also lead to beneficial outcomes, as they also follow a competitive logic and can lead to valuable innovations (for example, if several innovative companies in the same sector are subsidised when several countries/blocs pursue the same goals). This argument could be expanded into a concept for a kind of European DARPA, but this is beyond the scope of this paper.

[42] Kolev, S. (2021). When liberty presupposes order: F. A. Hayek's learning ordoliberalism, Freiburger Diskussionspapiere zur Ordnungsökonomik 21(2).

tailored regulation (see above). Therefore, the core disagreement seems to be whether transformation can be controlled centrally on this basis of constant interaction or only as a process of evolutionary adaptation via the decentralised selection mechanism of winners and losers on the market. By attempting to orchestrate innovation through cooperation between private and state actors, there is a risk of encouraging conformity and limiting the competitive freedom essential for developing adaptive economic structures and institutional structures.

Table 1: Features of traditional versus new industrial policy approaches

Feature	Traditional industrial policy	New industrial policy
Market failures targeted	R&D; innovation; learning externalities; coordination failures in investment	Traditional market failures, plus good-job externalities, direction of innovation, and missing public inputs
Sectors	Manufacturing; tradable sectors	Services in addition to manufacturing
Firms	Large, globally competitive firms	All sizes of firms, including SMEs
Assumptions about the government	Governments can identify market failure ex ante and are sufficiently insulated from capture	Knowledge about location and magnitude of market failures is widely dispersed; government faces substantial uncertainty; state capacity is endogenous
Types of incentives	Tax, credit subsidies	A portfolio of business services
Selection criteria	Pre-specified	Voluntary buy-in and specification
Conditionality	Hard; rigid ex-ante criteria	Soft; provisional, open-ended and evolving
Relationship with recipients	Distant	Collaborative, iterative; active project management

Source: Rodrik (2022).[43]

Table 1 provides an overview of distinct features of new industrial policies as compared with traditional approaches. At the empirical level, the school of new industrial policies faces the challenge of reconciling its theories with the widespread failure of industrial policy experiments in regions such as Latin America.[44] In this context, proponents point to the impeding roles of initial local conditions,[45] internal social conflict,[46] or insufficient conditionality of support measures.[47] In contrast, South Korea and Japan are often cited as success stories for well-organized and tailor-made industrial policy.[48] However, given the complex real-world interplay of policymaking with technological and cultural factors, the question of true causality is especially pressing in this context. And even if a positive impact

[43] Rodrik D. (2022). An industrial policy for good jobs. Policy Proposals. Hamilton Project.
[44] Robinson, J. A. (2009). Industrial policy and development: A political economy perspective. Washington, DC: The World Bank.
[45] Mukand, S. W., & Rodrik, D. (2005). In search of the holy grail: policy convergence, experimentation, and economic performance. American Economic Review, 95(1), 374–383.
[46] Rodrik, D. (1999). Where did all the growth go? External shocks, social conflict, and growth collapses. Journal of economic growth, 4, 385–412.
[47] Bulfone, F. (2023). Industrial policy and comparative political economy: a literature review and research agenda. Competition & Change, 27(1), 22–43.
[48] Aiginger, K., & Rodrik, D. (2020). Rebirth of industrial policy and an agenda for the twenty-first century. Journal of industry, competition and trade, 20, 189–207.

can be diagnosed, proven effectiveness alone is not a sufficient criterion for a sound economic policy. In view of the various alternative uses for public resources, such resources must also be used efficiently. This criterion requires the amount of societal resources invested to be justified by the extent of the welfare impact achieved. The following section provides some insights into recent findings from the vast amount of empirical literature on the impact of state aid in fostering economic development.

3.3 Evidence on industrial policies and economic development

The empirical literature on measuring the impact of industrial policy on macroeconomic indicators is about as diverse as the theoretical views. This is partly due to differences in the object of study. Earlier research can broadly be divided into specific country studies and econometric cross-country evidence. Country studies examined the success or failure of industrial policy interventions in the respective countries, largely based on sectoral or macroeconomic indicators of success such as output or productivity growth. This targeted look at individual countries allowed an intensive examination of the local institutional framework and the specifics of the national policy mix. However, conclusions on the causal impact of interventions were particularly difficult and debateable. Restricting the studies to individual countries meant that the effect of individual instruments in the national policy mix could not be identified and be isolated from the role of the overall social framework. Comprehensive cross-country studies offered the prerequisites for more reliable statistical inference through larger sample sizes and more variation in national policies. However, the bird's eye view taken by these studies meant that the role of the institutional specificities of the countries was often omitted from the analysis, as it could not be expressed in the form of measurable indicators.

A fundamental problem of both approaches is insufficient knowledge of counterfactuals. The economic development which specific countries would have experienced in the absence of industrial policy measures is not observable. This deficiency cannot be remedied by a comparison with a control group of countries that employ other forms of economic policy as the choice of policy instruments is not arbitrary but is itself a result of the initial economic conditions in a country. If this fact cannot be properly recorded and represented in the estimated model, as is often the case, the estimated policy effect will be biased.

Recent methodological approaches attempt to overcome or at least mitigate this selection problem. One strategy is to estimate the impact of industrial policy using company data.[49] This is a more direct form of impact measurement, since the desired effects of industrial policy are supposed to emerge via the advancement of companies (e.g. in the form of an increase in company-level productivity). The larger number of observations allows for more reliable inference. Since policy measures are not usually decided based on the performance of a single group of companies, the selection problem is also likely to be less severe. Another strategy is to conduct historical case studies, where the examples exhibit the character of "natural experiments". These are cases where industrial policy measures were born solely out of historical interruptions in the development of a country and could not therefore be predicted based on past economic development. Examples include the situation of countries in or after

[49] See, e.g., Amiti, M., Konings, J. (2007). Trade liberalization, intermediate inputs, and productivity: evidence from Indonesia, American Economic Review, 97(5), 1611–1638; De Loecker, J., Goldberg, P., Khandelwal, A., Pavcnik N. (2016). Prices, markups, and trade reform. Econometrica 84(2), 445–510.

wars or political revolutions. Such cases provide unique insights into the undistorted impact of structural change interventions.

Overall, this recent body of work in economic history illustrates the diverse strategies that states utilized globally in the 19th and early 20th century to cultivate domestic economic development.[50] Going beyond the conventional focus on protective import tariffs, this research identifies a spectrum of complementary policies, such as state-led technology acquisition, human capital development at the higher end of the skill distribution, intellectual property rights protection, and subsidies for prioritized industrial activities. Quantitative results provide discernible support for infant industry type mechanisms. More importantly, in diverse historical and geographical contexts, ranging from colonial Ghana to industrially advanced Britain, the establishment of integrated national markets, particularly through infrastructural development like railways, has been highlighted as a transformative lever in economic advancement. This is noteworthy, as it suggests that the EU could achieve at least some of its industrial policy goals also by strengthening the internal market and supporting digital infrastructure that reduces information and price gaps and helps European firms to innovate and modernise. Surprisingly, this literature on economic history finds that "accidental" industrial strategies such as fostering education or allowing for migration have often demonstrated a more significant positive impact on economic trajectories than intentional industrial policy strategies devised by governments – a point that would surely reverberate with Hayek. In the following, we point to individual studies in this body of work that are of particular interest in the context of this study.

In a seminal approach, Juhász (2018) examined mechanisms of technology adoption in the French Empire at the time of the Napoleonic Wars (1803-15) as an example of the effect of infant industry policies.[51] The Continental Blockade imposed by Napoleon against Great Britain represented the natural experiment in this case. Since this trade blockade was imperfect in its success and highly heterogeneous in its local implementation, this episode allows a comparison of the economic development of continental regions strongly shielded from trade with Britain with those less strongly shielded. In the field of cotton production, Juhász (2018) shows that in more shielded continental regions the adoption of the mechanised cotton spinning technology took place at a much faster pace. Moreover, the long-term view showed that these differences had a lasting impact on the development of comparative advantages as regions that were more protected at the time of the war still had larger cotton spinning industries in 1850. This indicates that protectionist measures in the phase of industry development can, at least under certain conditions, contribute to a long-term geographic shift in competitive advantages.

More recently, this empirical strategy has been taken up by several other studies. Giorcelli (2019) exploited the special economic situation in Europe after WWII to conduct a natural experiment.[52] She compared the long-term performance and survival rate of Italian firms receiving aid from the US through the Marshall Fund, during the 1950s, with those who were dropped from the program due to spending cuts. She showed that support in the form of sponsored management-training trips to the US had a long-lasting impact on survival chances and success indicators like employment and

[50] See the recent literature review in: Juhász, R. and Steinwender C. (2023). "Industrial Policy and the Great Divergence." SocArXiv. September 21.

[51] Juhász, R. (2018). Temporary protection and technology adoption: Evidence from the Napoleonic blockade. American Economic Review, 108(11), 3339–3376.

[52] Giorcelli, M. (2019). The long-term effects of management and technology transfers. American Economic Review, 109(1), 121–152.

productivity in the Italian firms. This impact exceeded the period of support by at least fifteen years, again providing evidence that temporary industry promotion policies can alter competitive conditions in a long-lasting manner. At the same time, however, an alternative form of support, the transfer of new machines, was proven to have no comparable long-term impact.

The recent empirical literature thus demonstrates the potential effectiveness of industrial policy instruments specifically for those historical periods in which the external framework conditions make an economic realignment necessary. However, the transferability of these experiences to Europe's current transformation phase is limited because neither climate change nor digitalization can be seen as natural experiments. Neither are exogenous disruptive events, but direct results of long-term economic and technological development. Moreover, the infant industry scenarios often examined in this literature are misleading for the transformation task. This is because the industrial transformation challenge is fundamentally different from the build-up challenge in several respects. On the one hand, the existing stock of capital and knowledge can be at least partially transferred to the new era, which reduces the amount of adaptation required. On the other hand, the existence of outdated industrial structures implies higher costs for any given level of adaptation, and thus a tendency toward weaker dynamics.

The view on competition also differs. The fact that the European industries concerned are already involved in intense global competition puts transformation under particular cost pressure. At the same time, however, the function of competition as a signalling and steering device for capital flows is essential for successful transformation because it points the way for the necessary investments. **As a rule, therefore, it is neither technically feasible nor economically desirable to shut out international competition during the transition stage. Instead of isolation, the focus must be on targeted compensation for those competitive disadvantages that are directly transformation-related, and thus aligned with the incentives to convert business models.** What the literature can teach us, however, is that cleverly designed support policies are apt to initiate successful structural change without causing disproportionate social costs. A prerequisite is that they address hurdles to competitiveness in a tailor-made way. First, policymakers need to anticipate a country's scope for the development of new long-term comparative advantages and/or the formation of new competitive markets. Then, they need to choose support instruments specifically focused on these goals.

Such a notion synthesizes the traditional opposition between sector-oriented industrial policy and market-oriented *Ordnungspolitik*. The key idea is to view successful sectoral restructuring and the development of new markets as a dynamic interplay. At the same time, however, it is not yet to be found anywhere as a fully developed concept. Our view is that the perfect place for this development is Europe, where the different traditions of economic policy thinking converge. In the next section, we will illustrate this by comparing the post-war approaches to economic policy in France and Germany, and then propose a synthesis aimed at supporting a united EU transformation policy.

4 Scope for a European transformation policy

4.1 German and French post-war economic thought on competition and innovation

Ideas about good competition act like a sponge absorbing the respective economic contexts and societal needs of a time. In past decades, characterised by growing globalisation, regulatory stability, and relative security, policymakers have rightfully focused on the traditional problem of decentralized, partial knowledge, which can be solved best by using competition as a discovery instrument. However, as the dependencies of Western societies and the needs of their citizens dramatically change, the political approach to competition needs to be updated, as argued above. The current polycrisis, in which economic outcomes are inherently linked to security and geopolitical goals, gives rise to trade-offs that go beyond questions of efficiency and the optimal allocation of resources. This creates a new knowledge problem, as politicians suddenly must deal – after many decades of abstinence – with industrial policy tasks. To remedy this knowledge gap and accelerate the necessary conceptual shift in competition thinking, an intense dialogue between German *Ordnungspolitik* and French industrial policy thinking is required. Based on a common language, the new knowledge problem can be efficiently tackled on the European level. To make this case, it helps to begin by looking back at previous stages of economic thinking in Europe, reflecting how positions on technological change have evolved over time, how they have differed between major Member States like Germany and France, and how they have adapted to the pressing needs of their respective eras.[53]

While economists and legal scholars typically prefer strict definitions and clear-cut categories, any discussion of how to adapt our understanding of industrial policy in times of economic transformation and global upheaval must begin by stressing that, from a historical perspective, focusing on economic thought, fair and mutually beneficial competition is not a fixed concept but rather an evolving one. The way in which competition is theoretically understood and legally regulated is influenced by historical developments, cultural norms, and political ideologies. The concept of competition acts like a "sponge" that absorbs these factors and thus shapes economic policymaking according to the prevailing ideas and values of a society.[54] For example, the understanding of competition in the early days of capitalism was heavily influenced by the classical liberal ideas of Adam Smith and David Ricardo, who argued that the "invisible hand" of competition would lead to greater prosperity.[55] This understanding of competition reflected the prevailing laissez-faire stance of the time, which favoured minimal government interventions in the economy.

In the immediate post-war years, both German and French economic thinking regarding achieving technological progress was heavily influenced by the need for reconstruction and recovery after the devastation of World War II. During this period, both countries focused on adopting and adapting existing technologies from other advanced economies, particularly the US, to rebuild their industries and infrastructure. However, there were also crucial differences in how this transformation process was put into place.

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[53] This section has benefited greatly from correspondence and exchanges with our cep France colleague Victor Warhem, whom we would like to thank for helpful comments.

[54] Ezrachi, A. (2017). Sponge, Journal of Antitrust Enforcement 5, 49–75.

[55] Van Bavel, B. (2016), The Invisible Hand (Oxford: Oxford University Press).

Focussing on the dominant understanding of competition at that time, and the historical context which encouraged it, allows a better understanding of the origins and aims of German *Ordnungspolitik*, as it is nowadays known – and often criticized – throughout Europe. The ordoliberal approach to economics emerged in Germany after World War II and advocated policies that would promote more competitive market structures, such as the strict enforcement of a cartel ban, the prevention of mergers and acquisitions that would lead to undue concentration, and the promotion of small and medium-sized enterprises. Early ordoliberals frequently used the expression of "complete competition" to emphasise that more competitive market structures would promote freedom, allocative efficiency, and innovation, rather than relying on market concentration to reap economies of scale or maintain high profits.[56] This approach was in stark contrast to the industrial policy approach that was being pursued by many other countries at the time, which involved direct government intervention in the economy to promote specific industries or sectors.

A typical example is France, a country that saw a focus on state-led economic planning and a commitment to building a strong national industry in the immediate post-war years. The French government played a central role in directing investments and creating industrial policies to support key sectors. In the field of telecommunications, for instance, France aimed for national independence in telecommunications through the *Direction générale des télécommunications* (telecommunication branch of the PTT) and the newly established public research center dedicated to telecommunications (CNET), prioritizing military and industrial aspects.[57] However, lowering rates for trans-European telecommunications raised concerns about reduced revenues, as international calls were the most profitable service and had subsidized lower rates for national and imperial traffic for many years. The state invested in research and development of new technologies, leading to advancements in long-distance communication and the growth of the telecommunications industry. This was epitomized by the "Minitel", a precursor of the modern computer, prevalent in France from the 1980s until the 2000s, before eventually succumbing to American technological dominance. Additionally, in response to the oil shock, strategic investments were made in the nuclear energy sector, driving France towards energy autonomy. Concurrently, the aerospace sector saw robust enhancement, aligning with public objectives such as bolstering the national defence apparatus through the development of advanced aircraft systems. These initiatives underscore the French state's pivotal role in steering industrial innovation to fulfil overarching public goals and national interests. In Germany's "social market economy", by contrast, the state also played a significant role in guiding economic development and technological progress, but this happened mainly through more targeted investments and subsidies. In the steel industry, for example, Germany invested heavily in modernizing and expanding steel production facilities.[58] This was, of course, also related to the initial impetus for European post-war cooperation, i.e. the creation of the European Coal and Steel Community in 1952 (see Section 4.2 below). Overall, Ludwig Erhard's social market economy framework aimed to combine free market principles with social welfare measures and targeted technological policy.

[56] Küsters, A. (2022). The Making and Unmaking of Ordoliberal Language. A Digital Conceptual History of European Competition Law (PhD dissertation, Frankfurt am Main, University of Frankfurt).

[57] Laborie, L. (2011). Fragile links, frozen identities: the governance of telecommunication networks and Europe (1944–53), History and Technology, 27(3), 311–330, here: p. 322.

[58] Technological advancements, such as the adoption of the oxygen steelmaking process, helped increase productivity and efficiency.

It is crucial to emphasise that from a contemporary point of view there were several reasons – both economic and societal – why the ordoliberal focus on competition law made sense in post-World War II Germany. First, the devastation caused by the war had left Germany with a severely damaged economy, and there was a pressing need to rebuild and modernize the country's infrastructure and industries. The ordoliberals recognized that a market-oriented approach was the most efficient way to allocate resources and promote economic growth. More significantly, they believed that more competitive market structures would help to prevent the re-emergence of monopolies and other market distortions that had contributed to the rise of Nazism and the devastation of the war. In this way, the dispersion of economic power would also benefit a society's political system and foster social harmony. To a certain extent, this strategy of *Ordnungspolitik* worked well: After the horrors of World War II and the initial reform period, relatively vibrant competition, together with extraordinary investment incentives, formed the basis for economic growth and prosperity.

However, the ordoliberal school – and the world itself – was not static and underwent significant changes. Gradually, the significance of competition in the German economy started declining due to increasing concentration, monopolization, and market agreements among other things.[59] The weakening of competition and the reduction of profitable investment opportunities led to a reduction in economic growth and an increase in the inflation rate. Eventually, the unique reconstruction mentality decreased, and the contradictions and inequalities in West German society became increasingly apparent. In particular, the experience of the economic crisis in 1966/67 played a significant role in influencing intellectual approaches to growth and innovation. This crisis significantly refuted the politics of overtly liberal *Ordnungspolitik* in public awareness, especially the widespread belief in continuous, stable, and crisis-free economic development. Short-time working hours, layoffs, and unemployment led to a mobilization of the workforce. Even among entrepreneurs, due to decreasing profit opportunities and investment and growth rates, there was a noticeable change of opinion. There was an increasing demand for state intervention in the Keynesian sense, meaning stabilization of profits through additional state orders. Here, the "global control" approach based on Keynesian ideas and propagated by the Social Democratic Minister for the Economy, Karl Schiller, was relatively successful in overcoming the crisis of 1966/67.[60] Subsequently, however, the problems of this Keynesian-oriented economic policy soon became apparent.

During the 1970s and 1980s, both German and French economic thinking again underwent significant shifts due to changes in the global economic landscape. The oil crises of the 1970s, the ensuing "stagflation", and increasing global competition challenged their earlier approaches to achieving technological progress. In German economic thinking, there was a corresponding shift away from the traditional ordoliberal focus on market structures and towards a new approach that emphasized unregulated, open competition as a discovery tool.[61] Adopting the Hayekian idea that the problem of diffuse knowledge is best solved by using the price mechanism as a summary statistic, the ordoliberals became, over time, more sceptical of the ability of regulators to make informed decisions about the

[59] This paragraph is based on: Nutzinger, H.G. (1975). Vom Wirtschaftswunder zur Globalsteuerung. In: R. Picht (ed.): Deutschlandstudien II, Bonn: DAAD, 129–171.

[60] For an overview, see: Hochstätter, M. (2006), Karl Schiller - eine wirtschaftspolitische Biografie (d-nb.info), Hannover: Gottfried Wilhelm Leibniz Universität, PhD thesis.

[61] Küsters, A. (2023). 'Ordering ORDO: Capturing the Freiburg School's Post-War Development through a Text Mining Analysis of Its Yearbook (1948–2014)', Economic History Yearbook 64(1), 55–109.

appropriate number of competing firms, concrete market definitions, or quantitative merger control thresholds. Similarly, they argued that government officials were unlikely to have the necessary information or expertise to support certain industries or sectors through industrial policy, and that attempts to do so would lead to inefficiencies and distortions in the economy. According to this Hayekian paradigm, any planned order eventually slides into dysfunctionality.[62] Overall, German economic thinking – and policy-making – therefore experienced a shift towards more liberal economic policies during this period. The emphasis on state intervention lessened, and there was a growing belief in the importance of market forces and competition to drive technological progress and innovation. To a certain extent, this was a global phenomenon in the "free world", which followed the end of the Bretton Woods Agreement, i.e., the start of the liberalisation of the capital account and financialization. Similarly, France also began to open its economy and promote market-oriented policies, but in a more restrained fashion. Tellingly, the French "Commissariat au Plan" was used until the middle of the 1980s. Grossly welfare-reducing decisions like the subsidizing of sunset industries including steelmaking led to its quasi-abandonment. The end of planification was official in 1993. Still, the state continued to play a large role in supporting strategic industries and technological research.

Again, there were several reasons why this conceptual and policy shift made sense at the time. With globalization returning, increasingly open economies, and the progress of European integration, the complexity of modern markets meant that it became less important to artificially increase competition within nation-states, not least since it became more difficult to anticipate the unintended consequences of regulatory actions. In this context, ordoliberal scholars supported an approach that recognized the limitations of policymakers' knowledge and emphasized the importance of allowing worldwide market forces to operate. In addition, there was a growing belief in the 1970s and 1980s that regulation had become overly burdensome, and that deregulation could lead to greater efficiency and innovation. Finally, the privatization of state-owned enterprises was seen as a way to introduce competition into previously monopolistic sectors, which could lead to lower prices and better service for consumers. For instance, in the late 1980s and 1990s, the German government began to deregulate the telecommunications industry, allowing private companies to enter the market and compete with the state-owned *Deutsche Bundespost*.[63] Empirically, this move led to reduced prices, increased innovation, and the introduction of new technologies and services.[64]

In the 2010s, German and French economic thinking continued to evolve in response to globalization, digitalization, and the challenges posed by emerging economies. Germany strengthened its position as a leader in technological innovation and industrial production. The government and private sector collaborated closely to invest in research and development, particularly in areas such as renewable energy, advanced manufacturing, and digital technologies. Meanwhile, France adopted policies to encourage entrepreneurship and support start-ups, promoting innovation in key sectors such as biotechnology, aerospace, and information technology. Overall, German and French economic thinking regarding achieving technological progress evolved over the post-war years, transitioning from state-led reconstruction to more market-oriented and innovation-driven approaches. The

[62] Aß, S.-M. (2023), 'Individualismus ohne Individuen', Jacobin (blog), 19 April 2023, https://jacobin.de/artikel/individualismus-ohne-individuen-friedrich-von-hayek-ludwig-von-mises-neoliberalismus-thatcherismus-thatcher/.

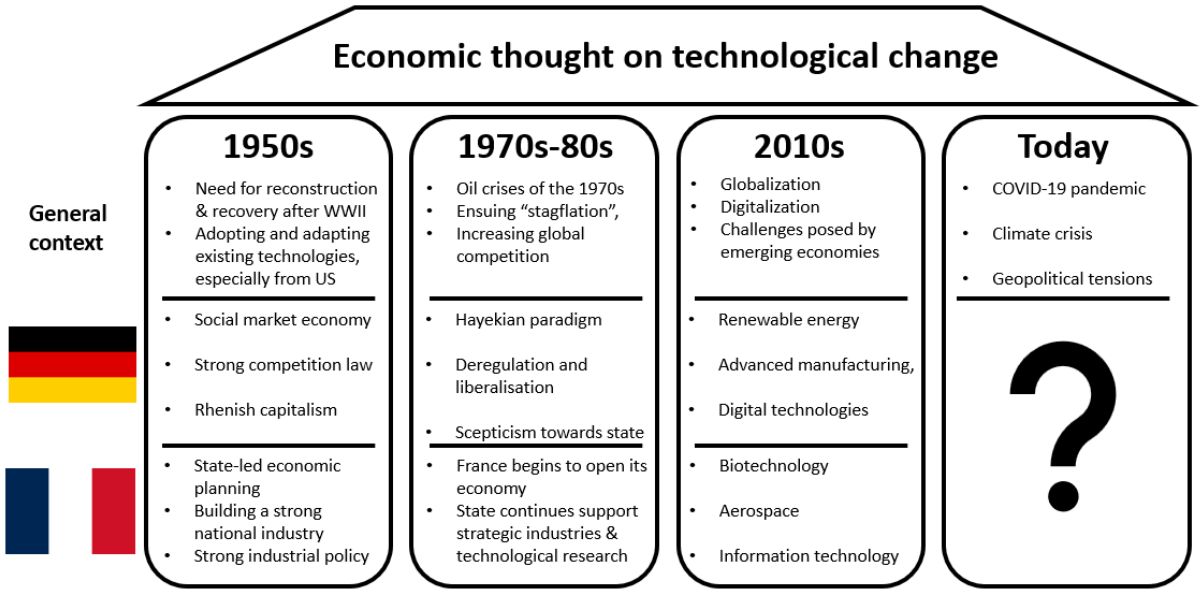
[63] Brandt, T., Drews, K., and Schulten, T. (2007), Liberalisierung des deutschen Postsektors – Auswirkungen auf Beschäftigung und Tarifpolitik, WSI Mitteilungen 5/2007 (boeckler.de).

[64] Deutsche Bundesbank (2000). Preiswirkungen der Deregulierung und Privatisierung auf den Gütermärkten - Dezember 2000 (bundesbank.de).

emphasis on adapting existing technologies in the immediate post-war years gave way to a focus on research and development, promoting home-grown innovation and sustainable technologies in the later years. However, recent years indicate the need for a massive transformation policy, which raises the question of whether this process must be reversed again – at least to a certain extent.

In recent years, the economic and societal context has once again significantly changed due to multiple crises, including the pandemic, the climate crisis, and growing geopolitical tensions. As these crises expose novel, interconnected challenges that are not fully anticipated by the two previous approaches to competition law and industrial policy, we need another conceptual shift that reflects this context of polycrisis (see Figure 1). As the political scientist Henry Farrell recently noted with respect to the success of the Hayekian paradigm: "Decades of assuming that government actors don't know enough to intervene in the marketplace have created a self-fulfilling prophecy in which government actors actually don't know, because they have never done industrial policy, have never been taught to do industrial policy, and lack the appropriate institutions and information to do it well, even if they abstractly knew how."[65] This new knowledge problem not only increases the probability of conducting sub-optimal industrial policy but also raises the spectre of powerful industry groups influencing European policy to an outsized degree, as regulators struggle to get the necessary knowledge and data about appropriate subsidies in short periods of time.

Fig. 1: Three stages in dealing with technological progress in post-war economic policy



Source: Own illustration.

Some conceptual inspiration could come from ordoliberalism (*Ordnungspolitik*), which has always viewed regulation as necessary to prevent market failures but has also recognized the risk of regulatory capture through vested interests. At the same time, the current state of confusion about the best European approach for a transformation policy makes clear that we lack research and concepts that could help policymakers to gain more precise insights about how to maintain competitive structures and innovative capabilities in very specific markets – while at least partly protecting them from the

[65] Farrell, H. (2023). 'Industrial Policy and the New Knowledge Problem', Crooked Timber (blog), 13 April 2023, https://crookedtimber.org/2023/04/13/industrial-policy-and-the-new-knowledge-problem/.

perfect storm of multiple crises. In addition to classic industrial policy, regulatory laboratories could play an important role here, offering scope for experiments limited in time, space, or subject matter, under changed rules.[66] **In short, we need a dialogue between German *Ordnungspolitik* and French industrial policy in order to update our understanding of competition for the challenges of the polycrisis. This requires, above all, developing joint concepts and a shared vocabulary, as any effective European transformation program can only work if it is based on a common language.** Before sketching some proposals for the way forward, in terms of the concrete policy mix and guiding principles that should be adopted by European policymakers to make this transformation successful, we must consider the legal scope and challenges for conducting industrial policy in the EU context.

4.2 Legal scope and challenges for an EU Industrial policy

The first European integration treaty, the Treaty establishing the European Coal and Steel Community of 1951, **clearly entailed industrial policy objectives**.[67] Although other objectives were also pursued,[68] **the Coal and Steel Community was granted powers to direct investment with the aim of an orderly expansion of production and the modernisation** of coal and steel production.[69]

In parallel, the Treaty of Rome of 1957 created the European Economic Community (EEC).[70] The non-sector-specific EEC Treaty did not, in principle, contain any competences with a specific industrial policy background.[71] The **focus was on opening the national markets** with the aim of creating a common market – **the internal market** –[72] with physical barriers, technical barriers, fiscal barriers, and currency-related barriers removed step-by-step over the course of time.[73] The internal market with the fundamental freedoms became – and remains – the central pillar and a core principle of the EU.[74]

To protect competition on the internal market, **rules on state aid were also introduced** into EU primary law at that time. European state aid control is historically and globally unique as it has neither models nor equivalents at the national level.[75] Alongside cartel law, European supervision of state aid is the second pillar in a system of rules that protects competition from distortions within the internal market.[76]

The **starting point for a European industrial policy** can be seen in the so-called Colonna Memorandum sent by the Commission to the Council in 1970, according to which **a policy of industrial development was indispensable for the economic unification of Europe**.[77] However, these developments were not

[66] Andritzky, J and Hesse, N. (2023), Gastbeitrag ‚Experimentierrepublik Deutschland', Wirtschaftliche Freiheit, 1 May 2023.
[67] Classen, in: von der Groeben / Schwarze / Hatje, Art. 173 AEUV, para. 11.
[68] See Bundeszentrale für politische Bildung (2021), Vor 70 Jahren: EGKS-Vertrag: "Coal and steel were the central economic fields of industrialised economies at that time. Warfare without these two industries was considered unthinkable. Robert Schuman confessed in his government declaration that he wanted to communitise coal and steel so that 'any war between France and Germany would not only be unthinkable but materially impossible'".
[69] Classen, in: von der Groeben / Schwarze / Hatje, Art. 173 AEUV, para. 11.
[70] In short: the decisive predecessor of the European Community (EC) and subsequently the European Union (EU).
[71] Classen, in: von der Groeben / Schwarze / Hatje, Art. 173 AEUV, para. 13.
[72] Classen, in: von der Groeben / Schwarze / Hatje, Art. 173 AEUV, para. 13.
[73] Piepenschneider, in: Bergmann, Handlexikon der Europäischen Union, 6th ed. 2022, Binnenmarkt.
[74] Art. 3 TEU and Art. 26 TFEU et seq.; see altogether Ruffert, in: Calliess/Ruffert, Art. 3 EUV, para. 22.
[75] Art. 92 et seq. EEC Treaty (1957); see altogether Götz, in: Dauses/Ludwigs, Handbuch des EU-Wirtschaftsrechts, April 2023, H. III. Staatliche Beihilfen, para. 1
[76] Piepenschneider, in: Bergmann, Handlexikon der Europäischen Union, 6th ed. 2022, Binnenmarkt.
[77] Ruffert, in: Calliess/Ruffert, Art. 173 AEUV, para. 2. See there for further developments between 1970 and 1993.

initially reflected in European primary law, as the EEC Treaty did not provide an explicit legal basis for a Community industrial policy.[78]

The Maastricht Treaty of 1992 inserted the predecessor of today's **Art. 173 TFEU**. In 2007, however, the Treaty of Lisbon made it clear that the measures based thereon must not include any harmonisation of the laws of the Member States.[79] Thus, **industrial policy is assigned to the "weakest" kind of EU competence** as the primary responsibility remains with the Member States and the harmonisation of Member States' law is not possible.[80]

By default, there is a **strong tension between special support measures for industry and undistorted competition** as a core principle of the internal market.[81] Another problem of industrial policy interventions is **the question of resources** as appropriate funds must be raised from the general budget. **Industrial policy is thus also closely linked to** efforts to curb the indebtedness of **public budgets**.[82]

The industrial policy competence of Art. 173 TFEU allows for the coordination of national industrial policies, in particular through benchmarking and the exchange of best practices.[83] As an act of support, in addition to proposals by the Commission **including the provision of financial resources**, Art. 173 in principle also allows for **the awarding of aid**, which **must not**, however, **lead to distortions** of competition and **must comply with EU state aid law**.[84] The **establishment of the European Institute of Innovation and Technology (EIT)** with its seat in Budapest was also based on a predecessor of Art. 173 TFEU.[85] In essence, though formally a "weak" EU competence, **the possibility to steer the coordination process should not be underestimated**.[86]

Yet, it is not so much its enshrinement in the treaties as the actual political development that shapes the discussion on an EU industrial policy.[87] **Its development is essentially independent of the EU industrial policy competence** and takes practical shape by way of the **open method of coordination**[88].[89] European primary law does not therefore hinder the development of joint concepts and a shared vocabulary to build an effective European transformation program.

This **broad scope for coordination and cooperation** finds its limitations though, principally when it comes up against fundamental freedoms and fundamental economic rights.[90] Beyond this and especially with regard to its connection with competition and public budgets, it is – and remains – important to have benchmarks for "effective" and "efficient" – and therefore "correct" – industrial

78 Ruffert, in: Calliess/Ruffert, Art. 173 AEUV, para. 3.
79 Ruffert, in: Calliess/Ruffert, Art. 173 AEUV, para. 3.
80 Lurger, in: Streinz, Art. 173 AEUV, para. 1.
81 Lurger, in: Streinz, Art. 173 AEUV, para. 2.
82 Ruffert, in: Calliess/Ruffert, Art. 173 AEUV, para. 14.
83 Ruffert, in: Calliess/Ruffert, Art. 173 AEUV, para. 25.
84 Lurger, in: Streinz, Art. 173 AEUV, para. 31; Gundel, in: Grabitz / Hilf / Nettesheim, Art. 173 AEUV, para. 21.
85 Lurger, in: Streinz, Art. 173 AEUV, para. 31.
86 Ruffert, in: Calliess/Ruffert, Art. 173 AEUV, para. 25.
87 Ruffert, in: Calliess/Ruffert, Art. 173 AEUV, para. 7 et seq.
88 A form of intergovernmental policy-making that does not result in binding EU legislative measures and it does not require EU countries to introduce or amend their laws; see https://eur-lex.europa.eu/DE/legal-content/glossary/open-method-of-coordination.htm
89 See Ruffert, in: Calliess/Ruffert, Art. 173 AEUV, para. 8.
90 Ruffert, in: Calliess/Ruffert, Art. 173 AEUV, para. 8.

policy state interventions.[91] In other words, a balance between ensuring competition – both now and in the future – and an effective industrial policy to support a European transformation programme must be found. In the following, and final, section, we aim to distil several principles that could guide European policymakers wanting to implement such a comprehensive transformation programme in the coming years.

4.3 Opportunities for synthesis: Principles for high-quality transformation policy

In the current polycrisis, the pursuit of achieving sustainable growth and welfare-enhancing digitalisation has become a pressing concern for Europe (see Section 2). To secure Europe's prosperity in a future digital and climate-neutral age, fundamental restructuring will be necessary in most sectors of the economy. In macroeconomic terms, this will require the replacement of significant parts of the capital stock as well as strong efforts in the upskilling and reskilling of Europe's workforce. From the perspective of policymakers, the most critical part of this endeavour will be to establish a delicate balance between direct government control, e.g. in the form of regulatory laws (bans) and policies preserving the role of competitive forces.

Within this spectrum between sovereign control and the reign of free markets, industrial policy and *Ordnungspolitik* traditionally occupy different positions. Industrial policy does not regard it as the state's job to exercise direct control over productive resources, as envisaged by the ideal image of the "**engineer**" in the centralized interventionist state. It does, however, see it as its responsibility to steer the direction of structural change in the economy through targeted financial incentives for companies (grants, tax cuts, public loans), infrastructure investment or other forms of capacity-oriented support – akin to a "**gardener**" who lets the plants grow by themselves, but sometimes has to prune them or give them fertiliser. Classic *Ordnungspolitik* basically sees the state in a "**referee**" role. Unlike the "**night-watchman**" state of laissez-faire neoliberals, it is not fundamentally opposed to policy incentives for companies. However, the prerequisite for intervention is a clearly identifiable market failure and a restriction of incentives to the magnitude necessary to remedy this failure. **Thus, the key difference is not in the pool of regulatory instruments, but in the aspirations underlying their use**. In the case of traditional industrial policy, the strategy could be characterized as "confident-creative", and *Ordnungspolitik* as "cautious-conserving". In the same vein, based on Rodrik's argument (see Section 3.2), the new industrial policy could be described as "cooperative-creative". Using the metaphors described above, one could also say that Europe needs to find a balance between "refereeing" and "gardening".

In today's debate, German *Ordnungspolitik* and French industrial policy are often described – as we have seen – as two fundamentally opposed policy approaches towards transformation, and most of the literature surveyed sympathises with one approach or the other (Section 4). In other words: it seems that one can have only one or the other. Our discussion so far indicates that this is to some extent a distorted perception. In every country, the practically relevant question to answer is whether state actors can be expected to make a meaningful proactive contribution to shaping structural change under the given set of challenges. It is obvious that this question cannot be answered simply with a blanket "yes" or "no".

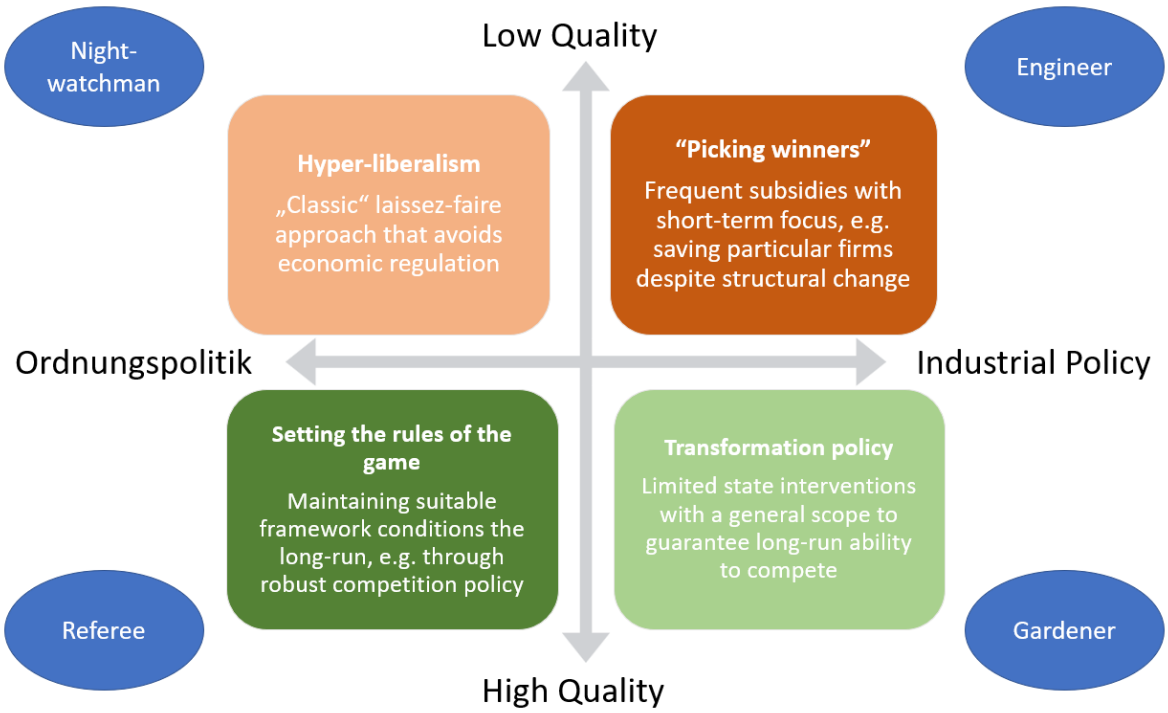
[91] Ruffert, in: Calliess/Ruffert, Art. 173 AEUV, para. 12.

Four essential preconditions that build on one another must be met. Research in the field of new industrial policy (see Section 2.3) points us to the first precondition: the state must possess the necessary detailed information on technologies and market structures. The extent to which this is the case depends crucially on the existence of communication channels with private stakeholders. The second prerequisite is that the external conditions do actually provide some positive scope for action. A main factor here is competitive pressure on global markets, but in the EU context also the role of European law (e.g. state aid rules). The third prerequisite is that the collective risks (e.g. for national budgets) associated with a policy initiative are considered acceptable/manageable based on scientifically well-founded risk assessment. If the first three conditions are met, there is a prospect of a welfare-optimal policy intervention under the given restrictions. However, a fourth condition remains to be fulfilled: policymakers must have sufficient incentive to actually choose this welfare-optimal measure from among the set of alternatives.

Measures that meet these requirements can rightly be called high-quality transformation policy, regardless of the individual ideological viewpoint on the economic role of the state. **Hence, the simple dichotomy between *Ordnungspolitik* and industrial policy appears inadequate in these times of dramatic, exponential change in the economic landscape and global geopolitics that are resulting in major external and internal challenges for the EU (Section 2). We need a more fine-grained approach to find the required policy mix in this new world, going beyond old antagonisms in European economic thinking.** To do this, we can rely on some of the ordoliberal insights presented at the beginning of this section (Section 4.1). In particular, we highlight the following ordoliberal principle: "**To ask whether we need less or more state activity, is missing the point. It is a matter of quality not quantity.**" These were the words of Walter Eucken, one of the founders of the Freiburg School, at the end of his last lecture given in London, shortly before he unexpectedly passed away there.[92] This principle could gain renewed relevance in a political debate that in Europe too often juxtaposes *Ordnungspolitik* and industrial policy in a binary and ideological way, leaving no room for shades of grey and conceptual innovation.

[92] Oswalt, W. (2001). Die falschen Freunde der offenen Gesellschaft, Münster, p. 117.

Fig. 2: Four styles of conducting transformation policy



Source: Own illustration. Note: The square boxes indicate the respective style for transformation policy; the blue circles reflect the implicit understanding of the state and the design approach of the implementing actors.

If we apply Eucken's insight to the usual policy spectrum between *Ordnungspolitik* and industrial policy, we end up with a matrix containing four different styles, of conducting economic transformation policy (see Figure 2). One axis represents the ambition and self-perception of the public actors behind economic policy, as outlined above, with a laissez-faire "night watchman" role and the more passive "referee" role, as envisaged in classical *Ordnungspolitik*, at one end of the spectrum, and the centralized interventionist state ("engineer" role) and the strategic user of industrial policy ("gardener") at the other. The other axis refers to the quality of policy instruments in the sense of the aforementioned quote from Eucken, approximating the effectiveness and nature of instruments varying from low-quality and haphazard interventions at one extreme to high-quality, well-designed interventions at the other. Sometimes, these high-quality interventions are necessary to ensure an economy's long-term prospects, so one criterion for recognising them is their temporal horizon (short-term vs long-term).[93] In addition, sound *Ordnungspolitik*, especially the criterion of rule-based regulation, requires these interventions to be as neutral in scope as possible with respect to the resulting allocation effect. In other words, the state should avoid "picking winners" and instead use incentives, e.g. from the tax system, to support a wide range of industries involved in the digital and green transformation. However, this is often contradicted by the simultaneous desire for a "tailor-made" and thus limited intervention with a specific externality (e.g. targeted compensation of a population group affected by local environmental damage). In short, we substitute Eucken's high

[93] Küsters, A. and Andritzky, J. (2023). Die ZF.2050 Zukunft-Analyse: Wie zukunftsorientiert ist der Bundestag? (cepStudie), https://www.cep.eu/eu-themen/details/cep/die-zf2050-zukunft-analyse-wie-zukunftsorientiert-ist-der-bundestag-cepstudie.html.

quality policy instruments with the two criteria of long-term focus and generality, while defining low-quality instruments through their short-sightedness and non-neutrality.

The resulting policy options in this matrix can be interpretated as follows.

- **Hyper-liberalism (state as "night-watchman")**: The upper left box in Fig. 2 refers to a situation of minimal government control (*Ordnungspolitik*) of the economy, with policy instruments that are of low quality and effectiveness. This approach is generally associated with laissez-faire (or neoliberal) economic policies, where the government's role is limited, and the small number of market interventions that take place lack direction and coherence. The result might be inefficiencies, market failures, and a lack of support for long-term competitiveness. While this type of regulatory politics avoids both burdening companies with detailed regulations as well as so-called crowding out of private activities, it might be insufficient in times of strong external and internal pressures for change, due to the crippling presence of disincentives such as coordination and information externalities (see Section 3.2).
- **Setting the rules of the game (state as "referee")**: The lower left box represents a situation where the state has a limited role (*Ordnungspolitik*) in the economy, but the policy instruments implemented are of high quality and well thought out, such as securing an appropriate legal system and implementing strong competition laws. Even with a small government presence, these well-designed instruments can address market failures, support necessary infrastructure, and foster long-term competitiveness – especially in rather static times without structural breaks or fundamental changes in the economy or political environment.
- **"Picking winners" (state as "engineer")**: The upper right box focusses on planning and "picking economic winners", indicating a higher level of state involvement in the economy. However, the policy interventions implemented are of low quality and may suffer from lack of information, rent-seeking by industries, a lack of strategic foresight and short-term thinking. A classic example would be unconditional subsidies given to a sector impacted by structural change in order to save jobs, typically before an election. This approach can lead to market distortions and a potential misallocation of resources with respect to long-term comparative advantages – in short, it is inadequate for dealing with the current transformation.
- **Transformation policy (state as "gardener")**: Finally, the lower right box represents a situation with significant state involvement in the economy through industrial policy, but the policy interventions are of high quality, address the underlying levers of the economy through broad generality, and focus on establishing long-term competitiveness. This is what we call in this paper high-quality transformation policy. In this case, the state aims to create a conducive environment for businesses to thrive, as well as investing in infrastructure, promoting innovation, and providing targeted support to strategically important industries. More specifically, this style of transformation policy sets out targeted, well-designed measures to promote the development and growth of those digital and green industries which exhibit a credible perspective for long-term competitiveness. This includes, for example, tax incentives, government investment in research and development, subsidies for capacity building and training, access to cheap credit and, most importantly, investment in skills training and cooperation between industry and universities. Overall, using such measures in a limited and circumscribed way can support sustainable economic growth, increased competitiveness, and

long-term prosperity – which is why it aligns, ultimately, with the long-term goal of *Ordnungspolitik*.

The key question thus becomes how policymakers can determine whether a specific proposal for conducting this new transformation policy, e.g. subsidising the construction of a particular type of semiconductor facility, actually falls into the "Industrial Policy, High-Quality Interventions" box and can be used by the state in its function as "gardener". We therefore close this discussion by outlining five key principles for assessing the "quality" dimension of industrial policy interventions based on rule-based economic thinking, such as *Ordnungspolitik*, resulting in an efficient transformation policy (see Figure 3). These principles collectively ensure that the policies are robust, sustainable, and efficient in resource use, aligning well with the principles of both *Ordnungspolitik* and new industrial policy. Obviously, each of these principles can be operationalized to achieve more specific indicators and ensure a comprehensive evaluation of the policy instruments' quality. And, needless to say, the design of actual industrial policy measures in Europe must consider the specific opportunities and constraints, including legal constraints, presented by sectoral needs as well as the national and even local contexts of Member States.

1. **Rule-bound consistency**: The chosen policy measure must adhere strictly to a predefined set of rules and guidelines that ensure consistency. In line with the economic doctrine advocated by ordoliberals (especially Public Choice), these rules should be clear, objective, and not easily manipulated for short-term gain or political purposes. To evaluate adherence to this criterion, there must be clear and scientifically well-founded regulatory frameworks guiding the selection of the instruments to be supported, such as by means of a listing of regulatory focus areas established on the basis of transparent and objective criteria. Such lists have recently been proposed by the Commission for critical raw materials, such as rare earths, and for strategic technologies such as semiconductors. Indirect evidence of rule-bound consistency in conducting transformation policy would be provided by the medium-term stability of the chosen policy in the absence of external shocks, indicating resistance to manipulations. At the same time, within these rule-based regimes, policies should be updated based on institutionalized monitoring processes (e.g. regular updating of a list of critical technologies based on technological progress reports).

2. **Market-based longtermism**: The proposed policy instruments should be designed with a long-term vision of a future division of labour, creating structural change that will benefit global competitiveness in the long run. For this to succeed, the Commission must formulate its vision for the long-term future instead of merely responding to crises.[94] Clearly articulating a vision which centres on a strong, precisely defined notion of future specialization, while leaving space for Hayekian how-to experimentation and discovery, is the best way forward, as "too much micromanaging with a shopping list of conditions"[95] can stifle innovation. On this basis, one can conduct scenario planning and regular empirical evaluation to make necessary adjustments that ensure continued relevance and effectiveness. Moreover, as stressed by the recent research on new industrial policies (see Section 3.2), continuous information exchange with industry stakeholders is also vital for strategic

[94] Küsters, A. and Andritzky, J. (2023). Die ZF.2050 Zukunft-Analyse: Wie zukunftsorientiert ist der Bundestag? (cepStudie), https://www.cep.eu/eu-themen/details/cep/die-zf2050-zukunft-analyse-wie-zukunftsorientiert-ist-der-bundestag-cepstudie.html.

[95] Mazzucato, M. and Rodrik, D. (2023). Industrial Policy with Conditionalities: A Taxonomy and Sample Cases. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2023-07), p. 7.

policymaking. In this exchange, policymakers must maintain a balance between involvedness and distance, avoiding the creation of channels for rent-seeking activities. To match the vision of self-sustaining business models, all support measures to industry must be of a transitory nature and time-limited ex ante. To mitigate the time inconsistency problem of policy commitments, the institutional framework must guarantee maximum transparency and accountability (see Point 5). Moreover, the unintended promotion of market power through public support can be avoided by linking support to eligibility criteria that prevent firms from aspiring to market concentration (e.g. not buying up competitors, not licensing certain patents).[96]

3. **Analysis of market contestability**: Assessing the response of markets to industrial policy necessitates an analysis of the market structure and pricing in the specific industry that is to be targeted. This is well illustrated by a recent research paper that dives into the structural concerns in the US heat pump market in light of the subsidies introduced by the Inflation Reduction Act (IRA). It found that "[w]ithout detailed attention to the market structure of the industry, the subsidies' effectiveness in increasing production and lowering consumer prices will be blunted by problems of limited competition and investors' remarkably high expectations for financial returns".[97] This finding is relevant to markets other than heat pumps and also concerns the strategic sectors likely to be targeted by the new EU transformation policy. For instance, like the IRA, the EU and its Member States are implementing industrial policy measures (e.g. in the form of subsidies) for renewable technologies, advanced manufacturing, and semiconductor production. Therefore, before introducing a specific industrial policy measure, the Commission should conduct a thorough analysis of the market structure and pricing in the targeted industry as part of each impact assessment, including the development of forecast scenarios for the impact of structural change. Likewise, such an analysis can also be conducted to evaluate the likely "quality" dimension of a specific EU transformation policy measure.

4. **Proportionality**: As we noted earlier in the discussion on natural experiments that illustrate the benefits of transitory industrial policy measures, the chosen policies not only have to be judged based on their likely effectiveness. In the current transformation phase, various stakeholders and industries are competing for increasingly scarce public resources to support transformation. In this situation, it is clear that every support measure comes with considerable societal opportunity costs. This must be reflected in policy evaluation by a deep and rigorous societal cost-benefit analysis, taking market interactions and general equilibrium effects into account. Only those measures considered proportional in this regard should pass the policy test. Moreover, given the particularly high degree of market uncertainty in transition times, every policy evaluation should specifically address the impact on risk distribution. Many industrial policy instruments (e.g. Carbon-Contracts-for-Differences) are associated with a considerable degree of risk transfer from private agents to public budgets (and thus the community of taxpayers). The expected extent of these transferred risks must be exposed by way of appropriate scenario-based forecasting technologies and scientifically well-established risk measures.[98] For this, policymakers need to rely on well-tested tools such as cost-benefit analysis, ensuring that the benefits significantly outweigh the costs, as well as monitoring and evaluation frameworks to track performance.

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[96] Mazzucato, M. and Rodrik, D. (2023). Industrial Policy with Conditionalities: A Taxonomy and Sample Cases. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2023-07), p. 6.

[97] Murry, M. (2023). Lessons From the Heat Pump Market, 072023_AELP_HeatPumps_R2-3.pdf (economicliberties.us).

[98] Wolf, A. (2023). Market instruments for a climate-neutral industry. cepInput No.7/2023.

5. Transparency and accountability: Transformation policy can only be consistent and successful in the long term if its measures gain social acceptance. After all, successful transformation is an endeavour which involves society as a whole, and whose benefits must be transparent to the population. An important prerequisite for this is the involvement of significant sections of the public in the policy debate. In communicating its visions to the public, government must be as transparent as possible, also sending clear signals about what kind of sectors and activities might not survive future structural change. As mentioned above, a scientifically well-founded impact assessment is essential for the decision-making process. This should not, however, replace democratic discourse about the political path to be taken, but provide a necessary information basis. For this to succeed, information on expected impacts must not only be available in full but also presented in a way that is as comprehensible as possible. At the EU level, the Commission should give more thought to how it can prepare the impact assessments on its legislative proposals not only in scientific documentation but also in formats that are more comprehensible to non-involved citizens. This would also be effective in making the decisive role of the EU in the transformation process even clearer to the public. For instance, the Commission's press releases employ unusually complex language, technical terminology, and a "nominal style", making them hard to comprehend, this is according to a text analysis of around 45,000 press releases over the past 35 years.[99] When contrasted with other forms of media such as political magazines, newspapers, or UK press releases, the Commission's communications contain fewer commonly used words and verbs that would make reading easier. Coupled with thorough ex-post evaluations, changing to a clearer, non-academic style of language and communication would also serve the accountability of decision-makers, which is also essential in achieving acceptance.

Fig. 3: General criteria for assessing the quality of transformation policies

Source: Own illustration.

[99] Rauh, C. (2023). Clear messages to the European public? The language of European Commission press releases 1985–2020, Journal of European Integration, 45:4, 683–701.

Overall, the conceptualisation proposed in this section helps us to go beyond the simple dichotomy between *Ordnungspolitik* and industrial policy and explains why interventions might be beneficial for competition in the long run, while creating market distortions in the short term. In other words, qualitatively good industrial policy (option 4 in our matrix) recognizes the importance of state intervention in fostering economic development in certain situations. **The focus is on creating a supportive framework for a wide range of strategic businesses to remain (or become) competitive in the long run. This requires avoiding ad-hoc interventions and instead implementing well-designed policies that address structural challenges and promote innovation and productivity. By establishing a predictable economic environment, such an approach can attract investment, encourage entrepreneurship, and ultimately enhance European competitiveness in the global economy.**

5 Conclusion

The diversity of challenges facing Europe's economic model is also having a significant impact on economic policy debates. Conventional patterns of thought that were seen as certainties are being called into question, and ideological doctrines are losing their importance as yardsticks. In such a situation, there is great need for intellectual (re-)orientation. Such a need cannot be satisfied by means of rhetoric alone, i.e., by simply coming up with colourful expressions for the purpose of political communication. There is a need for consistent and experience-rooted concepts to provide an EU transformation policy that puts an end to the predominance of reactive piecemeal instruments. Europe, with its wealth of policy experience and intellectual diversity, is just the right place to develop such concepts.

This cepInput aims to initiate a pan-European debate on common principles for a united transformation policy in the EU, i.e. on the part of Brussels and in the Member States. Based on the findings of recent literature on the effectiveness of policy instruments in shaping transformation outcomes, we propose five basic principles that should always be met, i.e. regardless of the concrete object of regulation: rule-based consistency, market-based longtermism, contestability, proportionality, and transparency/accountability. At the same time, we make clear that these principles do not correspond to a simple dichotomy between traditional ordoliberal and industrial policy lines of thought. The evaluation of transformation policy has at least two dimensions. It is not just a matter of how much reliance can be placed on the creative power of the market versus the state. It is also about how persistent a policy's effect is in terms of future competitiveness. In this respect, the distinction between the short and long term is essential. Policies must be anticipatory with respect to the exploration of future comparative cost advantages and the development of new market structures. Moreover, the literature on new industrial policy teaches us that successful transformation policy cannot be understood as an autonomous process. It requires permanent exchange with affected stakeholders to overcome the public-private information gap and to provide continuous feedback on the impact of policy.

Such a new way of thinking must, however, avoid any naïve denial of the collective risks associated with long-term transformation policies. This refers to the risk of cooperating on policy too closely or too one-sidedly with certain stakeholder groups, which manifests itself in rent-seeking activities. It also refers to the fiscal risks for taxpayers that result directly or indirectly from risk-taking government interventions. Permanent external policy monitoring and the accountability of decision-makers are therefore of vital importance, as reflected in our principles. In general, a scientific and transparent approach to policymaking, ensuring the reign of fact-based reasoning over manipulative narratives is currently more important for Europe than ever.

Centrum für Europäische Politik
FREIBURG | BERLIN

Authors:

Dr. Anselm Küsters, Head of Division Digitalisation & New Technologies
kuesters@cep.eu

Dr. Patrick Stockebrandt, Head of Division Consumer & Health
stockebrandt@cep.eu

Dr. André Wolf, Head of Division Technology, Infrastructure and Industrial Development
wolf@cep.eu

Centrum für Europäische Politik FREIBURG | BERLIN
Kaiser-Joseph-Straße 266 | D-79098 Freiburg
Schiffbauerdamm 40 Räume 4205/06 | D-10117 Berlin
Tel. + 49 761 38693-0

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