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Industrial policy analytics: conceptual foundations and lessons from EU experience [1]

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Abstract. *The purpose of the study is to determine the scientific and methodological foundations of industrial policy analytics and identify promising vectors of its development in the context of EU policy. Based on the use of analytical*

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tools, the authors examined industrial policy through the prism of sustainable development and identified the complex and multidimensional nature of the influences that determine its formation and results, in particular employment. The dynamics of the use of industrial policy instruments in the general set of policies were analyzed, which illustrates its growing strategic importance for economic development, competitiveness and structural transformations. The aspects that reflect the formation and implementation of industrial policy were summarized, the key ones and the relationship between them were considered. It was established that an important part of industrial policy analytics is the assessment of international experience and the adaptation of various models of industry management and support to national conditions. It was determined that modern industrial policy analytics should be focused on innovative transformations, digitalization, the "green" economy and their impacts. It is noted that a separate area of analytics is the study of economic security and industry resilience to crises, which is of key importance for countries in conflict or recovery, in particular for Ukraine. It is determined that industrial policy analytics requires a multidimensional and interdisciplinary approach that allows assessing the effectiveness of instruments, their impact in the short and long term, the resilience of policies to crisis impacts, and the distribution of benefits among different groups. It is substantiated that effective industrial policy research combines quantitative macroeconomic models, case studies for understanding decision-making processes, spatial and network methods for analyzing clusters and value chains, as well as scenario and forecasting approaches for planning under uncertainty. The authors systematize key approaches to industrial policy analysis, their goals, methods, expected results, strengths and weaknesses, and formulate practical recommendations for their application. Promising directions of industrial policy in the context of Ukraine's integration into the EU are considered.

***Key words**: industrial policy, analytics, sustainable development, data-driven*

approaches, indicators, EU industrial policy, innovation, «green» economy, digitalization.

Аналітика промислової політики: концептуальні засади та уроки з досвіду ЄС

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Анотація. *Мета дослідження полягає у визначенні науково-методичних засад аналітики промислової політики та ідентифікації перспективних векторів її розвитку в контексті політики ЄС. Авторами на основі використання аналітичних інструментів розглянуто промислову політику крізь призму сталого розвитку та визначено складний і багатовимірний характер впливів, що визначають її формування та результати, зокрема зайнятість. Проаналізовано динаміку використання інструментів промислової політики у загальному наборі політик, що ілюструє її зростаюче стратегічне значення для економічного розвитку, конкурентоспроможності та структурних трансформацій. Узагальнено аспекти, що відображають формування та реалізацію промислової політики, розглянуто ключові з них та взаємозв'язок між ними. Встановлено, що важливою частиною аналітики*

промислової політики є оцінювання міжнародного досвіду та адаптація різних моделей управління і підтримки промисловості до національних умов. Визначено, що сучасна аналітика промислової політики має бути орієнтована на інноваційні трансформації, цифровізацію, «зелену» економіку та їх впливи. Відзначено, що окремий напрям аналітики полягає у дослідженні економічної безпеки та стійкості промисловості до криз, що має ключове значення для країн у стані конфлікту або відновлення, зокрема для України. Визначено, що аналітика промислової політики потребує багатовимірного та міждисциплінарного підходу, що дозволяє оцінювати ефективність інструментів, їх вплив у коротко- та довгостроковій перспективі, стійкість політики до кризових впливів і розподіл вигід між різними групами. Обґрунтовано, що ефективне дослідження промислової політики поєднує кількісні макроекономічні моделі, кейс-дослідження для розуміння процесів прийняття рішень, просторові та мережеві методи для аналізу кластерів і ланцюгів створення вартості, а також сценарні та прогнозні підходи для планування в умовах невизначеності. Авторами систематизовано ключові підходи до аналізу промислової політики, їх цілі, методи, очікувані результати, сильні та слабкі сторони, а також сформульовано практичні рекомендації щодо їх застосування. Розглянуто перспективні напрями промислової політики в контексті інтеграції України до ЄС.

Ключові слова: *промислова політика, аналітика, сталий розвиток, підходи, орієнтовані на дані, індикатори, промислова політика ЄС, інновації, «зелена» економіка, цифровізація.*

Introduction. Industrial policy determines the direction in which a country's economy will develop not only tomorrow, but also in decades to come. It influences which industries will receive a boost to growth, which enterprises will be able to modernize, and whether new sectors will emerge in the economy that can compete

on the global market. It is not an abstract set of different measures, but a targeted activity that affects the interests of business, employes, scientists and communities.

Its importance is especially felt in the context of rapid technological changes and global competition, when the struggle is not only for investments or exports, but also for a place in global production chains, access to innovations and critical resources. In countries experiencing a crisis or emerging from conflict, industrial policy becomes even more important, as it becomes a tool for restoring production capacity, creating jobs and increasing economic security.

Industrial policy analytics is needed to understand which instruments work effectively and which remain at the level of declarations. It allows us to assess the impact of decisions made on economic growth, social stability, regional development and technological progress. It is also a way to identify past mistakes and prevent their repetition, to adapt the best international experience to national conditions, taking into account the unique needs and capabilities of the country.

Industrial policy analytics helps not only to determine priorities, but also to combine economic goals with social ones, for example, to ensure production growth along with the creation of decent jobs, regional development and environmental protection. As a result, this is the direction of industrial policy on which not only economic success depends, but also the ability of society to be competitive, resilient to crises and open to future challenges. At the same time, approaches to the analysis of industrial policy are dynamic, based on its complexity of decisions, and therefore require further in-depth research to capture their multidimensional nature and practical implications.

Literature review. The evolution of industrial policy has been increasingly shaped by the global transition toward sustainable development and the pursuit of Sustainable Development Goals (SDGs). EU Commission highlights the need for interconnections and coherence in policy design, emphasizing that industrial transformation cannot be separated from sustainability objectives [1]. Tools such as

SDG Interlinkages & Visualization framework provide analytical support for understanding multidimensional policy impacts [2].

At the global level, Industrial Development Report 2024 underscores how new industrial policies are moving beyond growth-oriented objectives toward sustainable, inclusive and resilient industrialization, reflecting the dynamics of digitalization, climate transition and post-crisis recovery [3].

National studies indicate that Ukraine's industrial policy faces structural imbalances and requires careful analytical justification. Y. Zaloznova [4] and V. Herasymchuk [5] point out structural problems, limited financial resources and insufficient coordination of state programs. V. Heiets [6] analyzes the formation of the economic profile of strategically important industrial sectors, emphasizing the need for systematic planning and analytics to assess development prospects.

Industrial policy analytics also includes evaluating sectoral disparities and the innovation potential of enterprises. Studies stress the importance of comprehensive analysis of the entrepreneurial sector's innovation needs [9], while Yu. Kindzersky [8; 10;11] highlights challenges of inclusive industrialization and the necessity of applying best practices for Ukraine's post-war recovery.

EU experience in this area is summarized by O. Zaiats and T. Yarema [13], K. Skorik [14] and other authors [15; 16], who emphasize the role of business support instruments, partnership platforms, and development programs in improving industrial policy effectiveness.

Technological and innovation aspects of industrial policy are increasingly considered through the lens of smart infrastructure and Industry 4.0. Yu. Zaloznova and V. Chekina [17] examine the stimulation of smart industry development, while study [18] analyzes its role as a driver of sustainable innovative industrial development. Studies by O. Prokopenko, M. Järvis, A. Maslov and H. Lopes [19], as well as O. Vyshnevskyi, M. Anufriiev, M. Bozhyk and T. Gulchuk [20], highlight the convergence of IoT, cyber-physical systems, and artificial intelligence as critical

factors for industrial digital transformation.

Finally, national industrial identity and distributed production models are highlighted as important for long-term resilience. O. Amosha and O. Amosha [21] stress the role of manufacturing-based models as part of Ukraine's rooted industrial future, while in our previous studies [22] we have demonstrated how data-driven approaches optimize regional development planning and support inclusive industrialization.

Literature reflects a multidimensional approach to industrial policy, combining global sustainability agendas, European integration strategies, technological modernization and post-war recovery imperatives. The Ukrainian debate emphasizes both retrospective lessons and forward-looking strategies, seeking to balance innovation, resilience and integration into European and global industrial landscapes. In summary, modern industrial policy analytics combines international experience, national specificities, technological innovation and digital modeling tools. It enables not only the forecasting of policy impacts but also the formulation of strategic priorities for sustainable, inclusive and technology-driven industrial development in Ukraine.

Research problem. Although the academic debate on industrial policy has expanded significantly in recent years, several areas remain insufficiently explored, particularly in the Ukrainian context. Much of the literature emphasizes strategic alignment with EU and the adoption of sustainability and innovation-oriented approaches, yet the practical mechanisms for embedding these analytical frameworks into Ukraine's industrial governance remain unclear. The dynamics of post-war reconstruction create additional gaps, as there is still limited understanding of how industrial policy can simultaneously address urgent recovery needs, long-term structural transformation and resilience against future shocks. Furthermore, while discussions highlight innovation, digitalization and Industry 4.0, the specific data-based pathways for integrating these technologies into Ukraine's fragmented

industrial landscape are underdeveloped. Questions of institutional capacity, policy coherence across different levels of government and effective monitoring of industrial policy outcomes also remain unresolved. In addition, the social dimension of industrial policy, including inclusiveness, workforce adaptation and the balance between regional disparities, has received less attention, leaving a critical analytical gap in designing policies, that ensure both transformation and sustainability.

The purpose of the study is to determine the scientific and methodological foundations of industrial policy analytics and identify promising vectors for this in the context of EU policy.

The **methodological framework** of the study is grounded in an integrated and interdisciplinary approach to industrial policy analysis, combining economic, institutional, social, and spatial perspectives. Industrial policy is examined through macroeconomic modeling and intersectoral linkage analysis to assess its structural impact on the economy, while cluster and spatial methods are applied to reveal regional growth poles and industrial specialization.

Main material. We propose to examine the analytical foundations of industrial policy based on its impact on sustainable development, which provides many opportunities for assessing its effectiveness. Industrial policy plays a central role in accelerating progress toward sustainable development, as it directly influences employment creation, structural transformation of production systems. Within the SDG framework, target 9.2 emphasizes inclusive and sustainable industrialization, positioning industry as both a driver and beneficiary of broader societal progress. Fig. 1 and 2 illustrate the synergies between target 9.2 and other SDG targets, mapping the extent to which industrial development is interconnected with a wide range of economic, social and environmental dimensions.

Fig. 1 demonstrates that sustainable industrialization is closely linked not only to economic growth and employment (SDG 8) but also to poverty reduction (SDG 1), food security and agricultural modernization (SDG 2), access to clean water and

sanitation (SDG 6) and affordable and clean energy (SDG 7). Moreover, the connections with sustainable cities and communities (SDG 11), responsible consumption and production (SDG 12) and climate action (SDG 13) highlight the environmental and social implications of industrial development. Strong synergies with life on land (SDG 15) and life below water (SDG 14) point to the importance of balancing industrial expansion with ecosystem conservation. Finally, the links to partnerships for the goals (SDG 17) emphasize the role of international cooperation in achieving industrial transformation.

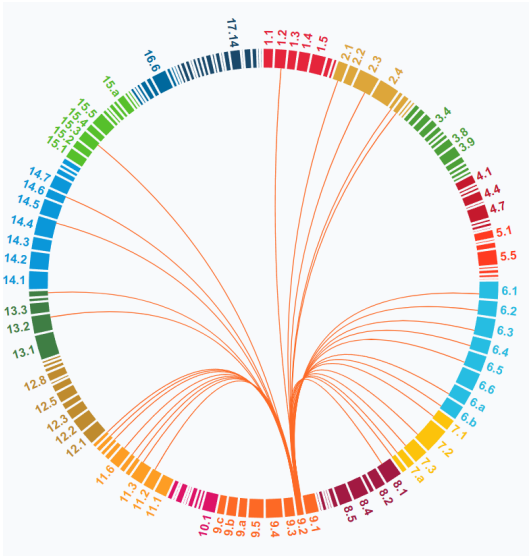

Fig. 1. Synergies between target 9.2 and other SDGs targets (JRC tool)
Source: compiled by authors using tool [1]

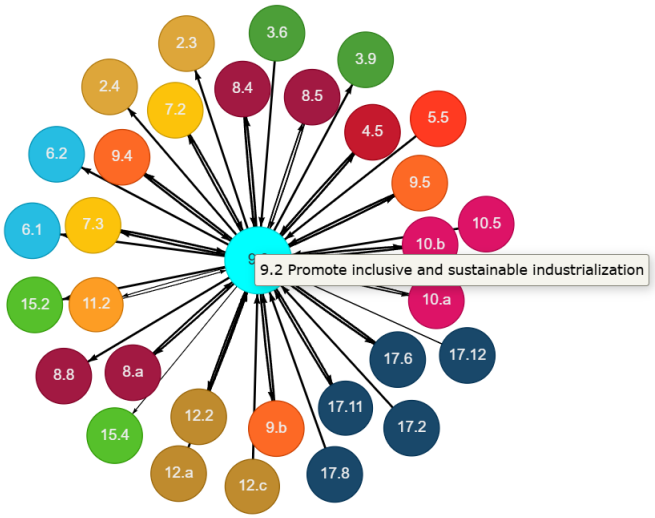

Fig. 2. Synergies between target 9.2 and other SDGs targets
(SDG Interlinkages Analysis & Visualization Tool)
Source: compiled by authors using tool [2]

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Overall, the fig. 1 and 2 underscore that industrial policy cannot be viewed in a narrow context. Instead, it represents a multidimensional activity whose outcomes are deeply embedded in the broader sustainable development agenda. The synergies around target 9.2 reveal that advancing industrialization in Ukraine and beyond requires policies that simultaneously address competitiveness, inclusivity and environmental sustainability while fostering systemic resilience.

One of the important impacts of industrial policy deals with employment. Fig. 3 illustrates the potential of different sectors to generate additional jobs worldwide, as well as in advanced and developing economies. It clearly demonstrates that manufacturing stands out as the sector with the largest potential for job creation across all contexts.

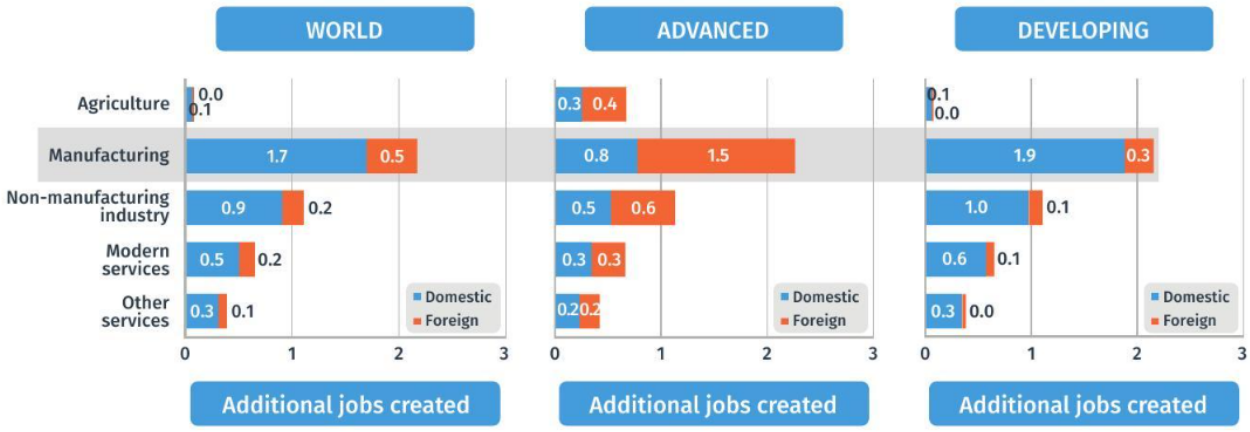

Fig. 3. Potential of different sectors to generate additional jobs
Source: [3]

At the global level, manufacturing is shown to add 1.7 million domestic jobs and 0.5 million foreign jobs, significantly surpassing other sectors such as agriculture, non-manufacturing industry, modern services, and other services. In advanced economies, the contribution of manufacturing to job creation is more balanced between domestic and foreign sources, with foreign employment playing a relatively larger role, reaching 1.5 million compared to 0.8 million domestic jobs. In contrast, in developing economies, the impact of manufacturing is overwhelmingly driven by domestic job creation, amounting to 1.9 million, while foreign-generated jobs remain marginal at 0.3 million. Other sectors, including non-

manufacturing industry and modern services, show some potential for additional jobs, but their impact is considerably smaller compared to manufacturing.

Increasing complexity of industrial policy can be confirmed by Fig. 4, which shows the proportion of industrial policy within the total set of policies, expressed as a percentage. The data indicate a clear upward trend, demonstrating that interest in industrial policy has grown significantly over time. Based on the number of analytical documents and policy measures, the share of industrial policy has doubled between 2009 and 2019. This dynamic reflects a growing recognition of the role of industrial policy as a strategic tool for economic development, competitiveness and structural transformation in response to global challenges.

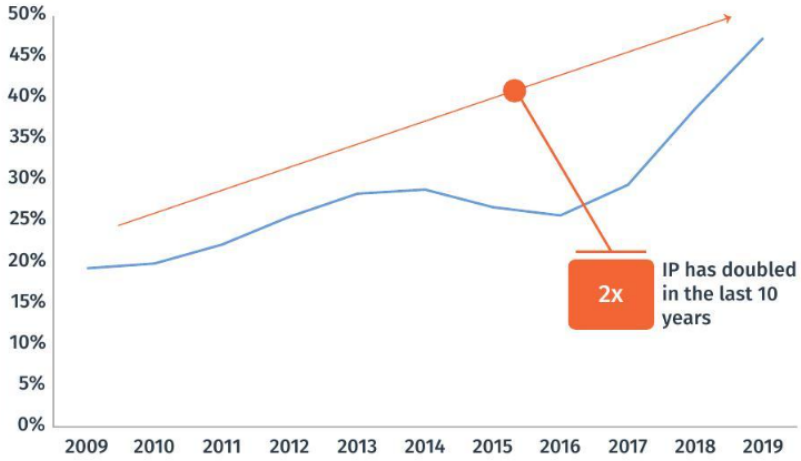

Fig. 4. Proportion of industrial policy over total policies, %
Source: [3]

Industrial policy from analytical point can be defined as a multidimensional methodology that covers (combines) economic, institutional, technological, social, security and other aspects of industrial development (Table 1). Its study requires the identification of key dimensions and appropriate analytical tools, each of which reveals a certain aspect of formation and implementation of industrial strategy.

Let’s consider main of them. Economic dimension covers financial mechanisms, investment attractiveness, domestic production dynamics and integration into international markets. It determines the extent to which industrial policy is able to stimulate growth and create added value in strategic sectors.

Table 1

Main dimensions of industrial policy

Dimension	Key components	Strategic objectives	Indicators	Illustrative practices
Economic	Investment climate, industrial output growth, export promotion, value chain integration	Stimulate GDP growth, enhance competitiveness, attract FDI	Industrial output index, share of manufacturing in GDP, FDI inflows, export growth rate	South Korea's export-oriented industrial strategy; Germany's support programs
Technological	R&D investment, Industry 4.0 adoption, digital infrastructure	Accelerate innovation, boost productivity, enable tech sovereignty	R&D expenditure as % of GDP, patent applications, automation rate	Japan's robotics industry policies; EU's Digital Europe Program
Institutional	Governance quality, regulatory framework, public-private partnerships	Improve policy coordination, enhance transparency, streamline regulations	Ease of Doing Business score, regulatory quality index, PPP project success rate	Singapore's pro-business regulatory reforms; UK's Catapult Centers for innovation
Social	Workforce training, employment, wage policies, regional development	Increase employment, improve job quality, reduce inequality	Employment rate in manufacturing, average wage, skills index	Denmark's flexicurity labor model; vocational training in Switzerland
Environmental	Green technologies, circular energy efficiency	Reduce carbon footprint, align with climate goals, ensure resource efficiency	CO_2 emissions per industrial unit, renewable energy share in industry	EU Green Deal industrial plan; China's renewable energy manufacturing sector
Geopolitical & security	Strategic autonomy, supply chain resilience, critical raw materials policy	Ensure economic sovereignty, protect key industries, support defense capabilities	Share of domestic production in critical sectors, diversification of import sources	US CHIPS and Science Act; EU Critical Raw Materials Act
Regional & spatial	Industrial clusters, regional innovation hubs, infrastructure connectivity	Balance regional growth, foster local competitiveness, prevent deindustrialization	Number of clusters, regional industrial output, infrastructure quality index	Italy's regional cluster development; China's Special Economic Zones
Innovation ecosystem	University-industry collaboration, tech transfer, incubators and accelerators	Foster startup growth, enhance commercialization of research	Number of tech startups, commercialization rate, innovation index	Silicon Valley model (USA); Israel's innovation authority programs

Source: authors` idea

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The technological dimension focuses on the implementation of innovations, digital solutions, automation and the development of the research base. In modern conditions, it is inextricably linked with Industry 4.0, green transformation and technological security.

The institutional dimension concerns the quality of public administration, the regulatory environment and the ability of public and private institutions to coordinate efforts to achieve industrial policy goals.

The social dimension takes into account the impact of industrial strategies on employment, wages, human capital development and the reduction of socio-economic inequality. The environmental dimension covers the ecological renovation of production, the transition to clean technologies, the implementation of the principles of the circular economy and the reduction of the carbon footprint of industry. The geopolitical and security dimension determines the ability of industry to ensure strategic autonomy, reduce dependence on imports of critical resources and support the defense capability of the state.

All presented in Table 1 dimensions are interrelated. E.g. technological innovation strengthens economic indicators and social investment in personnel contributes to faster adaptation to environmental and technological changes. Understanding the balance between them allows for the formation of a new generation of industrial policy that can ensure the competitiveness and sustainability of the economy in the long term.

Industrial policy research covers a wide range of topics that reflect different components of production systems development. One of the basic directions concerns the analysis of theoretical foundations from classical ideas about the role of the state in the economy to modern concepts of innovation, green and mission-oriented industrial policy. This allows us to understand what principles support for industry is based on and how the approach to it is changing under the influence of global trends.

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An important area of research is the study of instruments and mechanisms for implementing industrial policy, in particular the system of tax incentives, state investments, credit guarantees, export support, development of industrial parks and special economic zones etc. Assessing the effectiveness of these instruments allows us to identify which of them really contribute to the industrial development and the growth of competitiveness.

Another priority direction is the analysis of international experience. Comparing the approaches of EU, USA, China, South Korea or Southeast Asian countries allows us to understand how different models of industrial management and support can be adapted to national conditions. Here, research on integration into global value chains plays a special role.

Industrial policy analytics also focuses on innovation and technological transformation of industry, including the introduction of digital technologies, automation, the development of a "green" economy and circular production models. This is combined with the study of the impact of industrial policy on social aspects (employment, training, regional development and reducing socio-economic inequality).

A separate area of research concerns issues of economic security and resilience of industry to crises, from the localization of production to ensuring strategic autonomy in critical sectors. This is especially relevant for countries in a state of conflict or recovery from it, such as Ukraine.

So industrial policy analysis requires a multifaceted and interdisciplinary approach. Each methodological approach allows answering a separate set of questions: which instruments work, what effect they have in the short and long term, how resilient the policy is to shocks, which groups win or lose and how to reduce risks. In practice, effective analysis combines several approaches: quantitative models to assess macroeconomic effects, qualitative case studies and policy analysis to understand decision-making processes, spatial and network methods to study

clusters and value chains and scenario/foresight methods for planning under uncertainty.

The table 2 systematizes key approaches to industrial policy analysis, their objectives, methods, expected results, strengths and weaknesses and practical recommendations for application in the policy process.

Industrial policy analysis should start with a clear question and objective: whether to assess the effectiveness of existing mechanisms, predict the impact of new incentives or develop a strategy to increase the resilience of supply chains. This will determine the selection of methods from the table. For most tasks, a top-down approach is recommended: macro-assessment to understand the big picture, micro-analysis to test hypotheses at the firm level and policy and institutional assessment for implementation. Data sources (official statistics, back-office data of enterprises, surveys, interviews with key actors, patent databases, customs statistics, satellite and spatial data) determine which methods will be available and acceptable.

For Ukraine, given the need for post-war reconstruction, the optimal analysis strategy combines institutional and policy analysis (to understand barriers and opportunities for policy implementation), quantitative macro- and microeconomic assessments (to model economic impacts), assessment of supply chain sustainability (resource autonomy), as well as spatial analysis and cluster research (to develop regions and create economic hubs). Such a mixed approach provides the most complete picture and practical recommendations for policy formulation.

In Ukraine, it is important to invest in data infrastructure (long-term business registers, high-quality sector statistics, innovation and patent data) and in institutional capacity to implement monitoring and evaluation systems and to conduct experiments (pilot programs with quasi-experimental designs). In parallel, spatial and cluster approaches should be used to facilitate regional recovery and scenario/foresight methods to prepare for possible geopolitical and technological shocks.

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Table 2

Main analytical approaches to industrial policy

Approach	Purpose / Key questions	Methods and tools	Typical outputs / Indicators	Strengths	Limitations / Risks	Practical recommendations
1	2	3	4	5	6	7
Macroeconomic / econometric analysis	Estimate economy-wide impacts of industrial policies: GDP growth, employment, productivity	CGE models, macro-econometric models, VAR, panel regressions, difference-in-differences	GDP contribution, employment multipliers, sectoral growth, fiscal cost-benefit metrics	Quantifies aggregate effects; useful for policy costing and scenario comparison	Requires high-quality data; strong assumptions; may miss distributional effects and firm heterogeneity	Use with sectoral/micro validation; run sensitivity analyses and present uncertainty ranges
Input-output and social accounting matrix (SAM)	Trace intersectoral linkages and indirect impacts of industrial interventions	Input–Output tables, SAM multipliers, shock simulations	Backward/forward linkages, multiplier effects, value-added by sector	Captures supply chain interdependencies and indirect effects	Static by nature; low resolution for firm heterogeneity	Update I-O tables regularly; combine with firm-level data for micro-validation
Firm-level / Microeconomic analysis	Understand firm behaviour, productivity effects, investment response to incentives	Microdatasets, panel data regressions, propensity score matching, randomized trials	Changes in investment rates, employment per firm, adoption of technologies	Captures heterogeneity; reveals distributional outcomes across firm types and sizes	Data access challenges; external validity issues; costly to implement experiments	Prioritize building longitudinal enterprise registries; use quasi-experimental designs
Value chain and global value chain (GVC) analysis	Assess position in value chains, bottlenecks, upgrading opportunities	Mapping, trade-in-value-added, firm surveys, stakeholder interviews	GVC position index, domestic value-added share, bottleneck maps	Identifies leverage points for upgrading and export promotion	Can overlook domestic spillovers; data on tasks and services may be sparse	Combine with trade policy analysis and cluster mapping for targeted interventions
Cluster and spatial analysis	Analyse regional concentration of industries, agglomeration economies, infrastructure gaps	GIS, spatial econometrics, cluster mapping, network metrics	Number/strength of clusters, regional productivity, commuting catchments	Useful for regional policy, infrastructure planning and spatial targeting	Risk of reinforcing inequalities; requires local institutional capacity	Use place-based strategies; avoid one-size-fits-all; strengthen local governance

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1	2	3	4	5	6	7
Innovation systems and tech-policy analysis	Examine how R&D, universities, firms and policy instruments interact to generate innovation	RIS/ NIS mapping, patent analysis, bibliometrics, surveys, technology roadmaps	R&D intensity, patent counts, tech transfer rates, collaboration networks	Targets innovation bottlenecks and systemic barriers	Causality hard to prove; long lags between intervention and outcomes	Invest in evaluative metrics, support intermediaries and tech transfer offices
Political economy and institutional analysis	Explain why policies are designed/implemented in certain ways; identify vested interests and governance constraints	Stakeholder mapping, process tracing, interviews, regulatory impact assessment	Governance bottlenecks, capture risk assessments, reform roadmaps	Critical for realistic reform feasibility and sequencing	Can be sensitive/political; qualitative nature may be questioned by technocrats	Use politically informed sequencing and build coalitions for reforms
Regulatory impact assessment (RIA)	Evaluate regulatory costs/benefits and administrative burden of industrial measures	Cost-benefit methods, compliance cost surveys, administrative data	Net present value of regulatory options, compliance cost estimates	Improves regulatory quality and reduces unintended burdens	May undervalue non-market benefits; requires institutional capacity	Institutionalize RIA in ministries; publish assessments for transparency
Environmental and green transition assessment	Estimate environmental impacts, decarbonization pathways, circular economy potential	Life-cycle analysis, energy modeling, input-output environmental extensions	Emission reductions, energy intensity, circularity metrics	Aligns industrial policy with climate goals; identifies green investment needs	Data-intensive; trade-offs between green goals and short-term competitiveness	Integrate green criteria into industrial incentives; use transition risk assessments
Resilience and supply-chain risk analysis	Assess vulnerability and resilience of critical supply chains	Network analysis, stress-testing, scenario modeling, concentration indices	Supply concentration, time-to-recover metrics, critical node identification	Informs strategic autonomy and crisis preparedness	May lead to inefficient reshoring if misapplied; costly to diversify	Prioritize critical sectors; balance resilience with cost-efficiency
Scenario and foresight methods	Explore alternative futures and policy robustness under uncertainty	Scenario workshops, Delphi, system dynamics, agent-based models	Plausible scenarios, strategic options, early warning indicators	Supports long-term strategic planning and mission-oriented policies	Scenarios are not predictions; can be ignored by short-term politics	Use participatory foresight; link scenarios to concrete policy options

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1	2	3	4	5	6	7
System dynamics and simulation	Model feedbacks, delays, non-linearities in industrial ecosystems	System dynamics models, agent-based models, simulation experiments	Dynamics of investment, adoption, employment over time; tipping points	Captures complex interactions and path-dependence	Requires careful calibration; may appear opaque to stakeholders	Pair with stakeholder engagement; visualize outcomes clearly
Social impact and labor market analysis	Assess social consequences: jobs, skills mismatch, inequality	Labor market microsimulation, household surveys, social accounting	Job creation/loss by sector, wage impacts, distributional indicators	Ensures social legitimacy and just transition considerations	Redistributional impacts may be politically difficult to manage	Link industrial measures with active labor policies and retraining
Comparative and policy transfer analysis	Learn from other countries' policies and adapt best practices	Comparative case studies, policy benchmarking, cross-country regressions	Best-practice typologies, implementation toolkits	Provides policy options and institutional blueprints	Context-specificity limits direct transferability	Emphasize adaptation, not copy-paste; pilot and iterate
Cost-benefit and public finance analysis	Assess fiscal affordability and economic returns of industrial programs	NPV, IRR, fiscal incidence analysis, public investment appraisals	Benefit-cost ratios, budget impact, fiscal multipliers	Essential for prioritization and accountability	Monetizing non-market effects is difficult; dependent on discounting	Use transparent assumptions; include sensitivity and distributional analysis
Network and stakeholder analysis	Map relationships among firms, institutions, and actors	Social network analysis, stakeholder surveys, qualitative mapping	Centrality measures, collaboration indices, coalition maps	Reveals leverage agents and collaboration gaps	Data collection can be heavy; dynamic networks change quickly	Use to design PPPs and intermediary institutions
Historical and path-dependency analysis	Understand long-term legacies and development trajectories	Archival research, historical case studies, institutional tracing	Narratives of industrial evolution, path-dependency maps	Explains why certain sectors or institutions persist	Less prescriptive for immediate policy changes	Use to identify reform windows and avoid past pitfalls
Mixed-methods and integrated assessments	Combine quantitative and qualitative evidence to provide holistic insights	Any combination above; integrative frameworks, meta-analysis	Comprehensive policy briefs, robust recommendations	Balances rigor with contextual richness	Resource- and time-intensive	Recommended for major reforms and strategic programs

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The EU industrial policy is one of the most systematic examples of a comprehensive approach to strengthening industry in the face of global competition and technological change. Its concept is based on several interrelated principles: supporting innovation, transitioning to a green economy, digitalization, developing the internal market and ensuring strategic autonomy.

One of the key elements of demand for analytics is the integration of industrial policy with other EU strategic documents, in particular, European Green Deal, Digital Decade Strategy and COVID-19 Recovery Plan. This allows to provide the coordination of investments, innovation programs and environmental transformation in a mutually reinforcing way.

For Ukraine, the EU experience has several important lessons. First, there is a need for a clear integration of industrial policy into the overall economic strategy and compliance with international obligations, in particular free trade agreements and climate goals. Secondly, it is necessary to provide strong support for the innovation sector, since it is technological development that determines the competitiveness of industry in the 21st century. Thirdly, it is important to take into account the regional dimension, including the development of industrial clusters and industrial parks can contribute to balanced economic growth.

As shown in Table 3, the analysis of EU industrial policy reveals several key approaches that may provide useful lessons for Ukraine.

It is also important that the EU pays significant attention to partnerships between the state, business and research institutions. This triangle of cooperation allows for rapid commercialization of research and attracting private investment to implement strategic projects.

For Ukraine such model can become an effective platform for the development of high-tech sectors, including the defense industry, IT and mechanical engineering.

Table 3

Key aspects of EU industrial policy and lessons for Ukraine

Key aspect	EU approaches	Lessons for Ukraine	Illustrative examples
Strategic integration	Industrial policy aligned with EU Green Deal, Digital Decade Strategy, Recovery and Resilience Facility	Integrate industrial policy into national economic strategy with clear links to climate and digital goals	EU Industrial Strategy 2020 and its 2021 update
Innovation support	Large-scale R&D funding via Horizon Europe, EIT, and public-private partnerships	Establish stable funding for R&D and innovation ecosystems; foster tech transfer	Horizon Europe
Green transition	Decarbonization targets, circular economy action plans, renewable energy in industry	Align industrial development with green transformation; introduce carbon reduction roadmaps	EU Green Deal
Digital transformation	Investment in AI, cloud computing, cybersecurity, and Industry 4.0 infrastructure	Prioritize digital skills, infrastructure, and manufacturing automation	Digital Europe Program
Single market strengthening	Removal of trade barriers, harmonized regulations, free movement of goods and services	Simplify regulatory environment; harmonize with EU standards	Single Market Program
Resilience and strategic autonomy	Support for domestic production in critical sectors (e.g., semiconductors, raw materials)	Build capacity in strategic industries; diversify supply chains	EU Chips Act; Critical Raw Materials Act
Cluster development	Support for regional innovation clusters and cross-border cooperation	Foster industrial clusters and tech parks for regional growth	European Cluster Collaboration Platform
Financing and investment tools	Access to European Investment Bank loans, InvestEU program	Develop targeted financing tools for industrial projects	InvestEU; EIB green industry loans
Skills and workforce development	Reskilling and upskilling initiatives via Pact for Skills	Implement national workforce retraining programs tied to industrial development	EU Pact for Skills initiative
Trade and global competitiveness	Promotion of exports through trade agreements and market diversification	Use FTAs to expand industrial exports; support export credit mechanisms	EU-Japan EPA; EU-Canada CETA

Source: authors` idea

Conclusions. The study builds a view of the meaning of industrial policy and modern approaches to its analytics. Industrial policy is considered not simply as a set of state measures to support production, but as a strategic analytical methodology for shaping the country's economic structure, strengthening competitiveness and

ensuring technological breakthrough. Its impact extends to employment, innovation, regional development, integration into global value chains and national economic security.

Key approaches to industrial policy analytics include macroeconomic models and analysis of inter-sectoral linkages to cluster research, assessment of innovation systems, political and economic analysis, scenario forecasting and assessment of social and environmental effects. For each approach, its purpose, methods, expected results, advantages, limitations and recommendations for application are described. Such structuring allows building research programs that meet specific goals and resource capabilities.

Special attention is paid to the Ukrainian context, where post-war recovery requires comprehensive and flexible assessment methods. The importance of combining macro-level assessments to measure the overall economic effect with micro-level studies that reveal specific needs and behavioral patterns of enterprises was emphasized. At the same time, spatial and cluster analysis make it possible to identify regional growth centers and form effective local strategies.

The key conclusion was the understanding that without high-quality statistics, open and systematic data, developed institutional capacity and evaluation methodology, the effectiveness of industrial policy is significantly reduced. Ukraine needs to develop long-term databases of enterprises, innovation and technology statistics, as well as monitoring mechanisms and independent evaluation of the results of state programs.

Approaches to industrial policy analysis should be integrated, interdisciplinary and context-sensitive. Only such a combination can ensure a policy that not only responds to current challenges, but also forms the long-term competitiveness of the economy, balanced with environmental, social and security goals.

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