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Articles

aim
and scope of ASECU

ASECU was founded in 1996 as *Association of South-Eastern Europe Economic Universities* with the general aim of promoting the interests of those economic universities in South-Eastern Europe which are public, recognized or financed by the state of origin.

By decision taken in General Assembly of 2007, it was modified in Association of Economic Universities of South and Eastern Europe and the Black Sea Region. Presently, Universities and Research Centers are included to the active Full members of ASECU from Albania, Armenia, Bosnia-Herzegovina, Bulgaria, Greece, Montenegro, North Macedonia, Poland, Romania, Russia, Serbia, Slovakia, Turkey and Ukraine. Also, as Associated members, Universities from Bangladesh, China, Egypt, Hungary, Kazakhstan, Lebanon and Palestine.

The specific aims of the Association are:
To promote cooperation between Economic Universities, Faculties, Departments; i.e., especially: a) to exchange views and information about syllabi, b) to exchange undergraduate and postgraduate students and c) to exchange teaching and research staff.

To provide members with the opportunity exchange information, opinions etc. by publishing a relevant scientific journal or by cooperation in elaborating scientific studies in relation to the future development of higher education and research as well as to improve their quality in the field of economic studies and business administration.

To undertake initiatives for the protection of the interests of members and their institutions, so as to be supported by international organizations and in particular by the higher education institutions of the European Union.

To encourage cooperation between universities inside and outside the countries referred to in the Association.

To pursue cooperation in the field of higher education with the consolidation of close relations with other organisations having similar aims, e.g. E.U.A.;

To provide opportunities for harmonising the degrees of faculties and departments of the universities participating in the Association;

To promote cooperation between economic universities, faculties, departments in the field of research for the benefit of the economy, the society, peace and the cultural development of the countries referred to the Association.

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FOREIGN SUPPORT FOR INNOVATION AND ENTREPRENEURSHIP IN GREECE

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Abstract:

Based on an extensive report conducted by the authors in July 2024 for the Inter-disciplinary Laboratory of Black Sea and Mediterranean Studies (ILABSEM), according to the relevant Entrusted Research Service Agreement with Ningbo University of Technology, this paper discusses the various sources of foreign (mainly financial) support for the current Greek innovation ecosystem and entrepreneurship, especially regarding startups and innovative activities. Additionally, the paper assesses the effectiveness of these measures through in-depth interviews with stakeholders/key-personnel and concludes by presenting certain policy implications and making suggestions for future research.

Keywords: financing of innovation, financing of startups

JEL codes: O32, O38

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1. Introduction – EU and Greek innovation ecosystem and support

In terms of private capital investment, Europe is one of the fastest-growing regions. European startups accounted for 33% of all capital invested in rounds of up to $5 million. In 2022, 39% of EU firms developed or introduced new products, processes, or services. Similar to the US, nearly 70% of EU firms use at least one advanced digital technology. EU companies effectively implement robotics and digital platform technologies.

The European Innovation Council (EIC) provides the most promising deep tech startups in Europe with additional support to scale breakthrough innovations through a unique mix of public grants and private equity investments via the EIC Fund. Furthermore, measures under the Capital Markets Union (CMU), and support through Invest EU are also offered. The latter, mobilising more than € 370 billion in extra investments, will further encourage private investment to boost innovation in Europe.

Despite the investments mentioned above, the EU has significantly fewer tech scale-ups than the US and China, while scale-up financing trails are behind those offered to startups. Moreover, the EU falls behind the US in certain key technologies, particularly artificial intelligence (AI).

Smart specialisation strategies are the primary framework used by the EU to strengthen national and regional innovation ecosystems. Member states and regions are currently updating their smart specialisation strategies in line with the established concept and relevant legal provisions for cohesion policy support. Supported actions include research, market uptake, and helping companies in:

- scaling up their ideas, as well as deploying and demonstrating deep technologies in real-world environments and with end users,
- accessing cross-border infrastructure and expertise, staff exchanges, training, and skill development,
- developing standards and regulations through regulatory sandboxes and innovation test beds.

Traditional bank products, including loans, credit lines, and overdrafts, continue to be the main source of external financing for European businesses. Alternative market-based resources, such as equity, still play a relatively small role in the EU, and the tax system supports the current situation as interest payments on debt are tax deductible, while costs related to external equity financing are not, in most Member States.

Firms have become increasingly dissatisfied with financing costs as monetary policy tightens and external funding conditions worsen. The share of EU firms unhappy with finance costs rose from 5% to over 14% within a year, according to the latest European Investment Bank Investment Surveys (EIBIS) (2022-2023). Financially constrained firms make up 6.1% of all firms, a 1.4% percentage point increase from the previous low in EIBIS 2021. Small and medium-sized enterprises (SMEs) are hit

particularly hard, accounting for 7.2% of all SMEs. There is regional variation within Europe, with Central, Eastern, and South-Eastern Europe having the highest proportion of financially constrained firms. In Greece, this issue is even more pronounced: the Hellenic Confederation of Professionals, Craftsmen and Merchants states that the European funds from the Recovery and Resilience Plan for Greece[1] typically end up in the hands of large corporations—nearly 86% (!).

Firms across the EU spent 47% of their investments on replacement in 2022, the same as in 2021. Investment in new products and services made up a smaller percentage of total spending (16%), especially in the construction sector (11%). Investment in intangible assets by EU firms accounted for nearly 38% of total investment on average, including R&D, software, training, and business processes. Internal financing provided 66% of the funding for EU firms, according to EIBIS 2023, followed by external financing at 26%. Intra-group financing made up, on average, 7% of total investment by EU firms.

Finally, compared to the US and China, the EU also lacks large venture capital (VC) funds willing to invest in big deal values. Pension funds and insurance companies account for only 12.7% of total VC funds raised in the EU in 2020, according to the distribution of VC investors across different investor types.

In Greece, in terms of know-how and technological exchange, foreign funding and support have played a crucial role in the modern history of the country's economy after World War II. Greece was one of the 16 European nations that responded to the US call for economic support through the European Recovery Program (Bank of Greece, 1978), announced by General Marshall at Harvard University in June 1947. According to the plan, providing economic support required the development of an economic reconstruction plan, which had to be submitted by the receiving country to the Organisation for European Economic Cooperation (OEEC). This plan, created by the Supreme Council of Greece's Reconstruction, marked the first systematic attempt at medium-term economic planning. The core idea of the plan was to promote synergy among different sectors of the economy and enhance their interconnections. As a result, a balanced distribution of funds across various industries was envisioned.[2]

This paper offers a comprehensive analysis of current foreign (EU, USA, etc.) support concerning innovation and entrepreneurship in Greece. Therefore, in the following pages, we first provide a brief review of foreign public and private funding schemes since 2015. In the second section, we present results of primary research through targeted interviews and questionnaires to capture and analyse the perspectives of experts, agents involved, and beneficiaries in Greece regarding these funds.

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1 https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/country-pages/greeces-recovery-and-resilience-plan_en

2. See Stathakis, G., 2004 and 1995. Furthermore, for an evaluation of the actual effects of the application of the Marshall Plan in Greece, see Zarotiadis G. and Karanatsis K. (2006).

This includes identifying best practices and strengths, as well as cases and weaknesses to be avoided in similar future initiatives. Finally, we conclude with policy recommendations and proposals for further research.

2. Foreign public and private funding schemes – an overview

Tables 1 and 2 in the Appendix provide an overview of foreign public and private funding schemes within the context of the so-called two programming periods, 2014-2020 and 2021-2027; naturally, public funding primarily results from EU funds. US funding is currently very limited and only applies to private contributions in venture capital schemes. Therefore, the overall scale of foreign support for innovation and entrepreneurship in Greece is limited at present, at least in the current period.

Venture capitals (VCs) typically conduct rounds of calls inviting interested start-ups to apply for funding. In response to the call, startups submit a brief presentation of their business idea, including information about the applicant, i.e. technology or product, current progress, revenues (current or projected), industry, team members, previous funding rounds, and so on. If the fund shows interest in the proposal after reviewing it, an initial meeting (interview) is scheduled to discuss the startup's plans in more detail. In the third stage, additional data about the market, competition, use of funds, etc., are requested. According to the Marathon VC report (2023), VCs in Greece conduct over 60 rounds of calls annually.

Based on data of the same report, total funding in US dollars increased during 2019-2021, reaching nearly $1 billion. However, there is a slowdown in the following two years. Another interesting point is that, although investment rounds mainly focus on early-stage startups (seed and Series A), the amounts invested by VCs mostly support the next stage of growth. This was particularly so in 2021 and 2022.

Moving on to details about EU funding, the Operational Programme "Competitiveness, Entrepreneurship & Innovation" (EPAnEK) was one of the seven Sectoral and thirteen Regional Operational Programmes of the Partnership and Cooperation Agreement (NSRF) for the 2014-2020 programming period, approved by the final EU Decision on 12/18/2014. EPAnEK serves as a prime example of horizontal public EU funding focused on innovation and entrepreneurship in Greece, and this is why it is discussed in more detail in the current report. The discussion will help us draw the necessary conclusions and policy implications. Because this programme was active during the outbreak of Covid-19, an additional €1.6 billion was allocated for 2021, the final year of the period studied.

EPAnEK covered all of Greece with a public expenditure budget of € 8.03 billion, of which € 6.58 billion was a direct EU contribution. The strategic goal of EPAnEK was to boost the competitiveness and export potential of enterprises, to facilitate transition to quality entrepreneurship, and to promote innovation and growth in domestic added value. Regarding the strategy for EU funding in Greece, it is notable

that EPAnEK focused on areas such as tourism, energy, agri-food, the environment, the supply chain, information and communication technologies, health and the pharmaceutical industry, creative and cultural industries, materials, and construction. Of the total budget, €1.96 billion was allocated to entrepreneurship, €542.5 million to the Research-Create-Innovate initiative, and €183.7 million to research grants. Additionally, the outbreak of Covid-19 highlighted that businesses were in urgent need of digital transformation.

The basic features of the programme regarding resource allocation are as follows: axes 1/1S, with an available Public Expenditure (PE) of € 4,162.2 million, are complementary and cover the entire country in the sectors of research actions (1b), Information and Communication Technology (I&CT) (2b), entrepreneurship, and renewable energy.[3] Below, we briefly present the main quantitative and qualitative features from the evaluation of the programme's implementation.

Area of support: Research Aid	• 1,118 projects have been included in the framework of the first and second cycles of Research-Create Innovate. The projects have a total budget of € 711 million, of which co-financed amounts to € 600 million and public expenditure (payments) to € 154 million. A total of 3,444 co-beneficiaries joined, of which 1,186 are businesses (unique VAT numbers) and 2,000 project participants.
	• 59 integrated projects of bilateral cooperation between Greek and Israeli, Russian, German, Chinese institutions, with a total budget of € 23 million, with a PE of € 21 million and public expenditure (PE) payments of € 3 million. Participants comprise 53 companies and 25 research institutions.
	• 142 ERANETS European cooperation projects of a total budget of € 25.6 million, with PE of € 24 million and PE payments of € 0.94 million. Participants comprise 42 companies and 30 research centres.
	• 81 projects of specific actions on aquaculture, industrial materials, culture of a total budget of € 40 million, with PE of € 36 million and PE payments of € 0.7 million. Participants comprise 94 enterprises and 34 research centres.
	• 35 Innovation Clusters of a total budget of € 54.25 million, with a PP/PE of € 40.4 million and 274 participant companies (Cycle B joined in 2022).
	• 11 Competence Centres of a total budget of € 20 million, with a PP/PE of € 11 million allocated to Infrastructure

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3. Reference is only made to interventions related to the field(s) of interest of the present research.

- 25 Technology Transfer Offices (maturation or operation) of 31 research institutions of a budget of € 8.2 million (PE).
- 1 pilot project "Green Island" with a budget of € 8.5 million and expenditure of € 0.75 million.
- RIS3 monitoring mechanism with a budget of € 4.4 million (PE) and expenditure (payments) of € 1.1 million.

Area of Support: I&CT and Digital reinforcement

- Action «Digital Step» includes 4,713 SME projects of a total budget of € 141 million, with a PE of € 70.5 million and payments of € 11 million (PE).
- Action «Digital Leap» includes 477 projects of a total budget of € 81 million, with a PE of € 40.6 million and payments of € 13 million (PE).
- 85 projects have been included to enhance the digitisation of urban and inter-city buses (KTEL) of a total budget of € 23 million, with € 14 million and payments of € 4 million (PE).

I&CT – Infrastructural investments, supportive to the entrepreneurial ecosystem:

- Cadastre Project "Compilation of temporary cadastral bases and Creation of the Cadastral Database in areas of the Fourth cadastral generation in Greece" of a total budget of € 390 million, with PE € 82 million, and PP payments of € 76 million (Major Project).
- Archaeological cadastre with payments of € 3 million (PE) (completed).
- INSPIRE project "Development of new web services to improve its operation Cadastre and adaptation of spatial information systems data of EKXA SA, as per the requirements of the INSPIRE Directive". Payments of € 7.2 million (PE) (completed).
- Project for services for the creation and distribution of national digital orthoimages and aerial photographs with payments of € 3 million (PE).
- Development of an extended innovative Spectrum Monitoring System to enhance digital entrepreneurship with an integrated PE of € 23 million and payments of € 2 million.
- Means of prosecution for Customs Services; PE of € 48 million, expenses € 3 million.

- Processing and distribution of meteorological data and products for businesses and citizens with an integrated IGC of € 12 million and payments of € 7 million (PE).

- Satellite Communications Spectrum Monitoring System with an integrated PE € 4 million.

- Digital culture projects (Athos Digital Ark, Megas Alexandros Virtual Museum, digital collections) with an integrated PE of € 37 million and payments of € 18 million.

- Digital Culture Projects (museums and historical sites) with an integrated PE of € 8.6 million.

Area of support: Entrepreneurship

- 2 studies/research projects are implemented to support innovation, entrepreneurship, and industry with an integrated Public Expenditure of € 8 million and payments of € 3 million.

- 19.820 investment projects (18.300 SMEs) with a total budget of € 3.3 billion are implemented with a corresponding Public Expenditure of € 1.64 billion and payments of € 684 million. The projects concern upgrading small and very small businesses; SMEs quality modernisation, modernisation and establishment of tourism SMEs; competitiveness toolbox, small and micro-enterprises entrepreneurship toolkit-in-trade; catering, education and environmental infrastructure.

Infrastructural investments, supportive to the entrepreneurial ecosystem:

- 66 projects of Open Trade Centres of Municipalities with an integrated PE of € 110 million and payments of € 8.3 million.

- Central market upgrade projects with an integrated PE of € 20 million.

- Laboratory accreditation structures, with an integrated PE of € 0.7 million and payments of € 0.4 million.

- Development of Broadband Infrastructure in Rural Areas, with an integrated PE of € 63.7 million, expenditure of € 57.9 million (major project).

- Central Computing Infrastructures for Information Society/ G-Cloud Node with an integrated PE of € 17.5 million and payments of €16 million.

- Modernisation of network infrastructures of academic/research institutions with an integrated PE of € 26 million and payments of € 7.4 million

- Network/computing services for hospital units with an integrated PE € 13 million and Payments of € 3.6 million.
- UltraFast BroadBand (UFBB) of a total budget of € 713 million, PP/PE € 266.5 million, free of charge (Great Project).
- G-Cloud Next Generation Phase B, with a PE of € 21.5 million.
- Development of public wi-fi point; PE of €15 million.

Major Projects:

- Revithoussa Liquefied Natural Gas (RLNG) Tank of a total budget of € 92 million with a corresponding Public Expenditure of € 32 million and payments of € 25 million (PE).
- Project of Cyclades Interconnection with the Continental Interconnected High Voltage System of a total budget of € 273 million and a corresponding Public Expenditure of € 136 million; Payments €129 million (PE).
- Crete-Peloponnese Interconnection Project; HETS PHASE I EP Interconnection 150kV, nominal capacity 2X200MVA of a total budget of € 356 million with a corresponding Public Expenditure of € 127 million and payments of € 100 million (PE).
- Construction of an Independent Natural Gas System (NGS) for Alexandroupolis of a budget of € 364 million with corresponding Public Expenditure of € 167 million.

Having a clearer understanding of what has been accomplished in previous years, we now move on to a detailed overview of the EU funding framework for the current programming period (2021-2027). EU funding is accessible to a wide range of businesses, regardless of their size or industry. Various types of financing, including loans, microfinance, venture capital, grants, and contracts, are available to eligible entities. Below, we provide an overview of how funding operates.

Local Financial Institutions: The decision to provide EU financing is typically made by local financial institutions, such as banks, venture capitalists, or angel investors. These institutions collaborate with the EU to offer additional financing to businesses.

Financing Conditions: The specific terms of financing, including the amount, duration, interest rates, and fees, are determined by these local financial institutions. It is important to note that the EU does not directly set these conditions but collaborates with local entities to facilitate funding.

Accessing EU Funding: Businesses seeking EU funding can reach out to more than 1,000 financial institutions across the European Union to explore their options and find the most suitable financing solutions.

Right to Credit Feedback: Entrepreneurs and business owners have the right to receive feedback from credit institutions regarding their credit decisions. This feedback can be valuable in understanding one's financial standing and enhancing one's prospects of obtaining financing in the future.

Regulatory Reference: Article 431 of the EU Capital Requirements Regulation is referenced as the legal basis for one's right to obtain credit feedback.

In summary, EU funding is intended to be inclusive and accessible to businesses across different sectors. Specific terms and conditions of the funding are set by local financial institutions, and businesses can access this funding through a network of such institutions throughout the EU. Additionally, businesses have the right to receive feedback on credit decisions, which can help them with their financial planning and future financing sources/attempts.

Necessary financial resources come from the following institutionalised funds.

European Structural and Investment Funds (ESIF): ESIF include several EU funds, such as the European Regional Development Fund, the European Social Fund, and the Cohesion Fund. These funds aim to reduce economic and social disparities among EU regions and support various projects related to regional development, job creation, education, and social inclusion.

European Investment Bank (EIB) and European Investment Fund (EIF): The EIB and EIF are key financial institutions in the EU. The EIB provides long-term loans and investment expertise to support EU projects in various sectors, including infrastructure, innovation, and climate action. The EIF specialises in supporting small and medium-sized enterprises (SMEs) through guarantees and venture capital.

European Fund for Southeast Europe (EFSE): EFSE is a fund that promotes economic development in Southeast Europe and the Eastern European neighbourhood. The fund provides financing to SMEs and microenterprises to stimulate economic growth and employment in the region.

Recovery and Resilience Facility: This is part of the EU's Next Generation EU recovery plan, launched in response to economic challenges posed by the COVID-19 pandemic. The facility allocates substantial funding to support EU member states in their economic recovery efforts, with a focus on reforms and investments to make economies more resilient and sustainable.

These funds and institutions are vital in promoting economic growth, innovation, and social progress throughout the European Union and neighbouring areas. The funds demonstrate EU efforts to invest in a more sustainable, competitive, and resilient future.

3. Views of agents, experts and beneficiaries in Greece

To complete a comprehensive analysis of foreign support for innovation and entrepreneurship in Greece, we conducted a survey using targeted interviews and questionnaires to gather and study the views of experts (representatives of administrative bodies and incubators), agents involved (representatives of venture capital firms), and beneficiaries (businesses and firms, especially startups, benefiting from foreign financial support) in the Hellenic innovation and entrepreneurship ecosystem. We compile different responses and present them collectively as related to the following six key issues: complexity of venture capital financing in Greece; sufficiency of financial resources for Greece's innovation and entrepreneurial ecosystem; evaluation of non-EU funding institutions and schemes; strengths and weaknesses of Hellenic startups; strengths and weaknesses of Hellenic financial institutions, such as venture capital firms, and contribution of research and university technology transfer offices to the development of the innovation and entrepreneurship ecosystem.

The survey aims to capture experiences and opinions of the Hellenic entrepreneurship and innovation ecosystem from business, financial, and operational perspectives. Characterised as a qualitative study, the survey/paper is based on a short questionnaire within the framework of a semi-structured written interview. The questionnaires were mailed to representatives of venture capital firms, pre-incubators, accelerators, and startups. Responses were collected between 15th November and 20th December 2023 (more details on the questionnaires and data collection are available upon request).

3.1 Evaluation of the degree of complexity of the startup financing process by venture capital schemes in Greece

Startups
Working with a venture capitalist is a time-consuming process. Numerous interviews, pitch deck preparation, presentation setup, and financial data requests by VCs require a lot of time. Since startups generally have low a revenue in their early years, a VC might want to invest based on current revenue, which may not be enough for the necessary scale-up. There is a growing trend towards funding companies able to scale quickly and easily, which usually leads to high profit margins. Additionally, companies with a product at a high readiness level are viewed as less attractive for investment and risk-taking.

The financing process is complex and time-consuming, but it makes sense given the risk involved in these investments. For a participant, the challenge isn't so much the complexity of the VC funding process but its simplicity. The problem with communicating with venture capitalists is the time it takes from the initial contact to presenting the business idea to them. One issue is that VCs often take their time to respond, which can discourage younger startups.

Venture Capitals

The complexity of the process for funding startups appears high, as it usually involves detailed estimates, filling out various documents, and managing many parameters. However, if we consider that the funding process from the Funds follows a specific step-by-step algorithm, then the overall complexity may not be as high as it initially seems. For example, the process begins simply with sending a PowerPoint (deck) or filling out a basic form requesting funding. This form includes information about the startup, such as technology or product, current progress, revenues (actual or projected), industry, team members, previous funding rounds, etc. If the investor shows interest, the next step is an initial meeting or interview to discuss the startup's plans in more detail. Then, additional information about the market, competition, and how funds will be used is requested. Generally speaking, as the evaluation continues and the investor's interest increases, more information is required.

Throughout these stages, the use of digital tools and online platforms improves accessibility for entrepreneurs and speeds up the funding approval process.

Pre-Incubators / Accelerators

The complexity of financing startups is relatively high, but it depends directly on the firm's maturity stage. The process itself is not complicated and to be clear. Initially, startups that are actively operating in the market and have customers can more easily attract investment capital when compared to business groups that are at an earlier stage and have only developed a minimum viable product or just conducted a pilot. At the same time, the country's business ecosystem and its level of development play a crucial role. For example, southern European countries, such as Greece, Italy, Albania, and Bulgaria, have been building their investment communities over the last seven years, while central, western, and northern European countries seem more familiar with financing initiatives. This framework also involves bureaucratic procedures and decisions made by institutional bodies in each country.

There is a problem with startups emerging from incubators and accelerators, which are essentially spin-off companies. Although these types of firms seem to have a "technological advantage" over competitors, VCs tend to be hesitant or very cautious about funding them/spin-offs.

3.2 Sufficiency of financial resources for the development of Greece's innovation and entrepreneurial ecosystem

Startups

Most startup participants said that ecosystem funding is inadequate. Resources do not meet the financing needs of potential businesses.

To one participant, financial source, albeit complex, are sufficient for companies that have a product ready for commercial use. For companies with materials and products under continuous improvement, funding is insufficient for the scale-up needed.

Several funding sources have been created in recent years to support startups at different stages of development. Maybe if the role of business angels was more formalised, it would help with early-stage funding and micro-credit programmes.

Venture Capitals

Overall, the availability of financial resources for developing Greece's innovative and entrepreneurial ecosystem can be considered sufficient up to late seed or early series A financing stages. There are investors (business angels, pre-seed funds, tech transfer funds, seed funds, and late seed funds) supporting concepts from the pre-MVP stage through the pre-seed stage (MVP but pre-commercial) and into early revenue.

Pre-Incubators / Accelerators

Financial resources allocated to the entrepreneurship ecosystem are increasing, and it appears that, each year, more funds are directed toward various purposes, such as implementing business plans and microloans. However, it is also observed that there are not enough organisations capable of supporting part of the financing, such as venture capital funds invested in pre-seed stage startups.

3.3 Opinions on the participation of non-EU funding institutions and schemes

Startups

Considering that the United States and China host the largest and most advanced technology companies, it was suggested that they might possess superior expertise. Additionally, a valuable point is the high number of millionaire founders in these countries, when compared to the EU and Greece, in particular.

Engaging more non-EU funding organisations would be helpful, especially if they provided access to funding along with extra information and support for their country or market.

All participants strongly agree that having more actors active in the field would be helpful.

Another participant mentioned that, considering the experience and dynamics of investment funds from the Middle East and the United States, it would be highly

advantageous to strategically attract VCs from outside the EU, potentially through government agencies.

Venture Capitals

Startups need to seek investors across Europe; it doesn't make sense to focus only on Greece. Therefore, involving entities outside the EU could be beneficial, as they can provide opportunities for investment and collaboration schemes that will strengthen the growth of better-established business ventures.

Pre-Incubators / Accelerators

Regarding financial institutions outside the EU, their influence will be positive and beneficial because new investment perspectives will emerge, along with new criteria for selecting startups. For example, such institutions might focus on the scalability index rather than the innovation indicator.

Any new source of funding is welcomed. The issue lies in the limited funding options available to Hellenic startups as there are relatively few VCs and business angels. The absence of modern financial infrastructure beyond the standard NSRF is clear. Resources that could be directed to institutions like universities might support startup microfinance programmes within those institutions. Additionally, resources exist outside the EU but, due to the lack of a comprehensive national strategy, such resources' potential may be overlooked in the Hellenic ecosystem.

3.4 Strengths and Weaknesses of Hellenic Startups

Venture Capitals

Strengths: they have a strong technical background, especially in areas like biotech and medtech, which are underrepresented in other ecosystems. Additionally, there is a noticeable cost advantage to such capitals when compared to major European hubs, such as London, Paris, Berlin, and Scandinavia, and significantly more compared to America/the US.

Weaknesses: Founders lack experience, especially in commercial roles, business development, sales strategies for domestic and international markets, and partnerships. Additionally, investors note that the founders of startups often lack the expertise to negotiate large partnership or client deals with multinationals. Finally, many investors see a need for strengthening product management roles.

Pre-Incubators/Accelerators

Hellenic startups grow in an ecosystem that is not yet mature and sophisticated enough and are trained in particularly challenging situations, which means they may respond at a later stage and adapt more effectively to market needs. At the same time,

team members are characterised by high quality hard skills, gained through academic studies or professional experience.

On the other hand, startups often face significant challenges when transitioning from developing a functional prototype to implementing it in real-world conditions via a pilot programme. This difficulty may stem from an immature national business ecosystem, which leads to substantial delays in prototyping. Additionally, many startups seek venture capital before reaching full maturity or having a clear long-term plan, which drives financial institutions to mistrust them.

The education system inadequately prepares young people to innovate and take on the risks and responsibilities of starting new businesses. The talent and technical knowledge are present, but the necessary mindset and collaborative culture are noticeably missing. Adding entrepreneurship courses to departmental curricula will help students develop skills and, more importantly, it will foster the mindset necessary for creating innovative startups.

3.5 Strengths and Weaknesses of Hellenic financial institutions e.g. Venture Capitals

Startups

Strengths: The strength of venture capital lies in its well-established individuals with extensive economic expertise. Another benefit such capital offers is the 50% tax break it carries when invested in a Hellenic startup. The emergence of successful startups, supported by innovation, communication with the Hellenic market, and access to both domestic and international cooperation networks, is now a key advantage due to quick communication and easy access to Hellenic venture capitalists and business angels.

Weaknesses: VCs are cautious, favouring simple, quick-paying solutions with limited technical support. VCs lack comparison to EU companies and are unlikely to invest in products with a 5–6 readiness level.

The fund's members' limited knowledge of technology and experience in managing deep-tech ventures may lead to lack of understanding of technology that generates long-term profits. However, after four years, both existing and new fund managers have gained more experience.

Venture capitalists in Greece have limited experience and funding, their only advantage being receiving support from the European Central Bank. They lack specialisation in Greek market sectors and face difficulties in attracting startups. VCs' weaknesses include limited financial resources, slow response times, and a tendency to favour deep-tech startups in high-demand U.S. markets.

3.6 Evaluating the contribution of research and university technology transfer offices to ecosystem growth & development

Startups

Technology transfer offices do their best. Significant progress has been made over the past 5–6 years. They need a non-equity fund to evaluate ideas through proof-of-concept or principle studies. Such offices help shape the culture of their individual ecosystems, build connections with the broader ecosystem, develop their members' entrepreneurial ideas, and protect and leverage their institutions' intellectual property.

What is very encouraging is that now university technology transfer offices have the staff to support their efforts thanks to new funding. However, these offices must strengthen their relationships with Hellenic and European funding agencies to better support early-stage startups.

Technology transfer offices and research institutions are often available to support new startups in any possible way. They help and contribute during the early stages of a startup, even if on a *pro bono* basis, to develop new ideas that will foster innovation, knowledge, and creativity.

Venture Capitals

Technology transfer offices of universities and research institutions are considered to play a crucial role in very early identification/detection of groups and opportunities. This is a role that investors do not have the time or resources to discover potential investment avenues. The TTO's role is vital in persuading researchers, both young and experienced, to commercialise the technology they have developed and to take their first steps in protecting intellectual property.

The creation of these offices is a positive step toward promoting technological innovation but their actual contribution to ecosystem development is not yet clear. A major issue identified by investors working with university technology transfer offices is the lack of a clear strategy, which leads to encouraging startups with very shallow ideas and business plans at university level.

Pre-Incubators / Accelerators

Technology Transfer Offices and incubators play a crucial role in helping businesses and research groups transition into the market and develop into viable startups and spin-offs. Through the academic methodology designed and implemented at the university, along with a network of mentors and various services offered, TTOs and incubators' contribution is further strengthened, making them more than essential for every university.

In recent years, funding from these sources has highlighted their contribution to the development of spinoffs and the support provided to researchers into intellectual

property issues. However, this role should be clearly defined and not mistaken with that of incubators or accelerators within institutions.

The survey briefly highlighted some strengths and weaknesses of the Hellenic innovation and entrepreneurship ecosystem.

Strengths:
- There is a strong technical background in areas like biotech and medtech, which are underrepresented in other ecosystems. The same argument also holds for other high-tech fields.
- Although opinions are not unanimous, financial resources for early-stage entrepreneurship are **sufficient** for this period. However, as the ecosystem grows in the coming years, additional resources will be required.
- Although the financial procedure appears complex, it is actually similar to those in other European countries. What is positive is that digital applications speed up the process.
- Technology transfer offices are new initiatives that aim to facilitate collaboration between research and academic communities and other partners in the ecosystem.

Weaknesses:
- The members of startups lack business and commercial skills, which is a consequence of the academic curriculum that doesn't provide such skills to students.
- Venture capital firms need to enhance their ability to handle investment proposals quickly.
- There is a shortage of funding for better established entrepreneurial projects.
- Technology transfer offices should enhance their professional skills needed for the screening process to prevent trivial/minor and superficial/immature business projects.

4. Concluding remarks and policy implications

Given Greece's especially important position in global geopolitics and geoeconomics, as well as the dynamics of the domestic research sector and the qualitative aspects within the otherwise small-scale Hellenic production, startups and innovative SMEs in Greece can benefit from foreign public and private funding. Access to Western and, especially, European markets, along with the ability of Hellenic research institutes and companies to effectively network with counterparts in Southeast Europe, the Black Sea, and the Eastern Mediterranean, can be very attractive to overseas investors. Furthermore, according to a recent opinion expressed by the European

Economic and Social Committee, the competitiveness of small-scale but deeply differentiated and high-quality products —typical to local production— is particularly strong, particularly in the so-called 'mature' global markets.[4] This further justifies the political choice to promote foreign capital toward the Hellenic innovation and entrepreneurship ecosystem. The main conclusions from the previous analysis are the following:

- In Greece, foreign funding and support in terms of know-how and technological exchange have been very significant in the modern history o national economy since World War II.

- Since 2015, within the framework of the so-called two programming periods 2014-2020 and 2021-2027, public funding has almost exclusively come from EU funds. US funding is currently very limited and only pertains to private contributions in venture capital schemes, thereby having a limited impact on foreign support for local innovation and entrepreneurship.

- EU funding is available for a wide range of businesses, regardless of their size or industry. Different types of financing, including loans, microfinance, venture capital, grants, and contracts, are accessible to eligible entities, playing a vital role in promoting local economic growth, innovation, and social progress throughout the country.

- Nevertheless, due to several external reasons and conscious political decisions, centralisation in Greece has been further strengthened during the past decades, leading to a higher concentration of market shares in oligopolies. Meanwhile, the administration of the Hellenic Confederation of Professionals, Craftsmen, and Merchants strongly criticises how EU funds of the current programming period (2021-2027) have been heavily allocated to favour large corporations.

- In the Hellenic innovation and entrepreneurship ecosystem, effective collaboration between startups and established research institutes -especially in biotech, medtech and other high-tech fields- lays a sound technical and innovative foundation.

- However, even if current financial resources for early-stage entrepreneurship appear somewhat sufficient for this period, as the ecosystem grows in the coming years, additional resources will be necessary!

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4. Check the content of EESC 'own initiative opinion' "Use-value is back: new prospects and challenges for European products and services" at https://www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/use-value-back-new-prospects-and-challenges-european-products-and-services-own-initiative-opinion

- The complexity of the procedures for accessing funds and completing investments is high according to the startups and agents involved. Implementing digital management procedures will improve these processes.
- Technology transfer offices are new initiatives in the Hellenic ecosystem and can play a significant role in connecting the research and academic communities with other stakeholders and investors.
- Startup founders, as well as the employed executives and staff involved, lack business and commercial skills. Therefore, venture capital agencies and other support schemes also need to improve their expertise in processing investment proposals quickly and, particularly, in providing initial guidance and consulting.
- There is a shortage of financial resources for better established entrepreneurial projects, and technology transfer offices should enhance their professional skills related to the screening process to prevent trivial/minor and superficial/immature business ventures.

The Greek innovation and entrepreneurship ecosystem offers a typical win-win situation for potential/prospective foreign, European, and international cooperation. Based on the content of this report and the conclusions drawn, we can develop/elaborate on the following policy recommendations to create an effective scheme for funding and supporting Greek startups and SMEs.

1. Funding and supporting policies should (almost) exclusively focus on the needs of Greek SMEs for two main reasons: first, because they represent the most promising and dynamic segment (according to the approach of 'venture capitals'), and second, because in the current allocation of EU funds, there is a provocative bias in favour of large enterprises. In other words, under present circumstances, needs of local beneficiaries and opportunities for foreign investors are well aligned.

2. Existing procedures for dealing with EU funds show high bureaucratic burdens, partly because of their public nature and partly because of the occasional nature of the projects supported. Therefore, the alternative for a future foreign supportive policy could be structured as follows:

   a. Initially, following the principles of a VC approach, small-scale financing along with additional consulting and support actions should be distributed/allocated to benefit many local SMEs and startups, using a quick, straightforward, online-driven application and evaluation process. These supportive measures should include networking services with partners in other countries and strengthening business skills, particularly addressing challenges of the modern, international economic environment.

   b. Following a more rigorous selection process in terms of evaluation, beneficiaries with safer and/or more dynamic development prospects will be able to

    apply for longer lasting and more substantial funding based on specific invest-
    ment plans.

    c. Extroversion, in terms of exporting and/or co-production activities, should be
       a key factor in evaluating progress in the second phase and the adoption of
       investments that need support.

3. The scheme of EU supportive policy (described in detail in the second chapter)
    provides several good practices that can be effectively utilised in other cases as
    well:

    a. Bi- and multilateral networking (including other countries, especially in
       South-Eastern Europe an Eastern Mediterranean) among the agents of the so-
       called "quadruple helix" – specifically business and chambers, academia and
       research institutions, local governance, and civil society organisations.

    b. Intensive staff exchange programmes, involving academia (faculty and stu-
       dents), applied research sectors, and even business executives and profession-
       als, inspired by 'Erasmus'- type policies.

4. All of the above require the existence of efficient, intermediary institutions that
    will support bilateral partnerships to strengthen the local innovation and entre-
    preneurial ecosystem in Greece. This can be the role of a bilateral Innovation
    Cooperation Centre that may handle (i) the administrative support for these ef-
    forts, (ii) periodic reporting and analysis of the situation, (iii) the enhancement
    of cooperation between Hellenic and foreign universities, research institutions,
    (pre-) incubators, and relevant public or private initiatives, as well as chambers
    and other organised entrepreneurial groups.

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APPENDIX

Table 1: Overview of funding schemes in 2014–2020

Public and Private funding schemes provided in non-VC schemes since 2015	Origin of the Fund	Public / Private	Fund allocation 1=EU-wide 2=Greece 3=Regional	Scope and Intended Goals	Total Budget (2014-2020)	Short Description	Additional Info
Partnership Agreement (PA) 2014-2020	EU	Public	2			The PA (Partnership Agreement for the Development Framework) 2014-2020 constituted the main strategic plan for growth in Greece with the contribution of significant resources originating from the European Structural and Investment Funds (ESIF) of the European Union.	The PA, through its implementation, sought to tackle structural weaknesses in Greece that contributed to the economic crisis, as well as other economic and social problems caused by the crisis or the weaknesses. Moreover, the PA 2014-2020 is called upon to help attain the national targets within the Europe 2020 Strategy. The target of the Europe 2020 Strategy is to foster growth that is: (i) smart, with more efficient investments in education, research and innovation; (ii) sustainable, because of the decisive shift towards a low carbon economy, and (iii) inclusive, focusing on job creation and poverty reduction.

Programme						
Programme EPAnEK	EU	Public	2	The pivotal strategic objective of EPANEK continues to be strengthening the competitiveness and extroversion of enterprises, transition to quality entrepreneurship, with front of innovation and increase of domestic added value. The Operational Programme for Competitiveness, Entrepreneurship & Innovation is central to the country's effort to create and support a productive model that will lead to the development and enhancement of the competitiveness of the Greek economy by leveraging private resources.	€ 8.03 billion (€ 6.58 billion EU contribution)	This model brings to the fore productive, competitive and extroverted sectors of the economy, such as tourism, energy, agri-food, the environment, supply chain, information & communication technologies, health and pharmaceutical industry, creative and cultural industries, materials – constructions. Supported by EPAnEK and in synergy with Regional Operational Programmes, the Smart Specialisation Strategy aims to connect research and innovation with entrepreneurship and to strengthen existing and/or new competitive advantages of the country and its regions. EPAnEK is structured around the following main Priority Axes: - "Enhancing entrepreneurship with sectoral priorities"; total budget: € 4,162.20 million. - "Adaptability of workers, enterprises and the entrepreneurial environment to new development requirements", total budget of € 672.41 million. - "Development of mechanisms to support entrepreneurship"; total budget of € 1,437.91 million. - "ERDF Technical Assistance"; total budget of € 114.48 million. - "ESF Technical Assistance"; total budget of € 25.44 million. - "Support for dealing with the consequences of the crisis due to the COVID-19 pandemic" with a total budget of € 1,607.88 million.
HORIZON 2014-2020 (HORIZON)	EU	Public	1	It provided research and innovation funding.	80.0 bn	Focused on multi-national collaboration projects as well as individual researchers and supported SMEs using a special funding instrument
INNOVATION FUND	EU	Public	1	The Innovation Fund is one of the world's largest programmes for showcasing innovative low-carbon technologies. It is a key funding instrument for delivering EU economy-wide commitments under the Paris Agreement and its objective for climate-neutrality by 2050.		The Innovation Fund focuses on: (i) Innovative low-carbon technologies and processes in energy-intensive industries, including products substituting carbon intensive ones, (ii) Carbon capture and utilisation (CCU), (iii) Construction and operation of carbon capture and storage (CCS) (iv) Innovative renewable energy generation, (v) Energy storage

SINGLE MARKET PROGRAMME (SMP)	EU	Public	1	Covers the single market, competitiveness of enterprises, including small and medium-sized enterprises, the sectors of plants, animals, food and feed, and European statistics.	a. The Internal Market: The SMP aims to ensure that citizens and businesses enjoy the benefits of the internal market and, through a range of tools, to ensure the citizens are aware of and can exercise rights and take full advantage of opportunities. b. Competitiveness (particularly of SMEs): The SME Strand of the SMP will provide various forms of support to businesses, in particular SMEs, in order to foster a favourable business environment and entrepreneurial culture, to facilitate access to markets, to reduce the administrative burden, to support the uptake of innovation and to address global and societal challenges. c. Effective standards: The SMP will provide financial support to organisations that develop European-wide standards to ensure that products and services meet an agreed level of quality and safety. d. Protect consumers: The SMP helps to assure that products on the market are safe and consumers know the rules and also helps national authorities to work efficiently together and communicate swiftly. e. Food Safety: Through the Food Strand, the SMP will prevent, control and eradicate animal diseases and plant pests, support sustainable food production and consumption, improve animal welfare, and enhance the effectiveness, efficiency and reliability of official controls. f. European statistics: : The SMP will provide funding to national statistics institutes for the production and dissemination of high-quality statistics to monitor the economic, social, environmental and territorial situation/circumstances, thereby providing for evidence-based decision-making in the EU and measuring the impact of EU initiatives.	54.61 million EUR
INTERREGIONAL INNOVATION INVESTMENTS INSTRUMENTS (I3)	EU	Public	1			
Programmes per regional authority in Greece	EU	Public	3			

Table 2: Overview of funding schemes in 2021-2027

Public and Private funding schemes provided in non-VC schemes since 2021	Origin of the Fund	Public / Private	Fund allocation 1=EU-wide 2=Greece 3=Regional	Scope and Intended Goals	Total Budget (2014-2020)	Short Description	Additional Info
HORIZON 2021-2027 (HORIZON)	EU	Public	1	Horizon Europe is the EU's key funding programme for research and innovation	€ 95.5 bn (incl € 5.4 bn from NGEU – Next Generation Europe – programme of the EU for Recovery from the COVID-19 crisis)	Horizon tackles climate change, helps to achieve the UN's Sustainable Development Goals, and boosts EU's competitiveness and growth. The programme facilitates collaboration and strengthens the impact of research and innovation on developing, supporting and implementing EU policies while tackling global challenges. It supports creating and better disseminating excellent knowledge and technologies. It creates jobs, fully engages the EU's talent pool, boosts economic growth, promotes industrial competitiveness and optimises investment impact within a strengthened European Research Area. Legal entities from the EU and associated countries may participate.	New elements in Horizon Europe European Innovation Council: Support for innovations with potential breakthrough and disruptive nature plans with scale-up potential that may be too risky for private investors. A 70% share of the budget is earmarked for SMEs. Missions: Sets of measures to achieve bold, inspirational and measurable goals within a set timeframe. There are 5 main mission areas as parts of Horizon Europe. Open science policy: Mandatory open access to publications and open science principles are applied throughout the programme New approach to partnerships: Objective-driven and more ambitious partnerships with industry in support of EU policy objectives.

Name	Region	Type	No.	Description	Budget	Objectives / Focus	Additional
INNOVATION FUND	EU	Public	1	The Innovation Fund is one of the world's largest funding programmes for the demonstration of innovative low-carbon technologies. It is a key funding instrument for delivering EU economy-wide commitments under the Paris Agreement and its objective of climate-neutrality by 2050.	€40 bn (2021-2030)	The Innovation Fund focuses on: (i) Innovative low-carbon technologies and processes in energy-intensive industries, including products substituting carbon intensive ones; (ii) Carbon capture and utilisation (CCU); (iii) Construction and operation of carbon capture and storage (CCS); (iv) Innovative renewable energy generation; (v) Energy storage.	EPAnEK is structured around the following main Priority Axes: (i) "Enhancing entrepreneurship with sectoral priorities": € 4,162.20 million; (ii) "Adaptability of workers, enterprises and the entrepreneurial environment to the new development requirements": total budget of € 672.41 million; (iii) "Mechanisms to support entrepreneurship" € 1,437.91 million; (iv) "ERDF Technical Assistance": total budget of € 114.48 million; (v) "ESF Technical Assistance": total budget of € 25.44 million; (vi) "Support for dealing with the consequences of the crisis due to the COVID-19 pandemic" with a total budget of € 1,607.88 million.
SINGLE MARKET PROGRAMME (SMP)	EU	Public	1	Covers the single market, competitiveness of enterprises, including small and medium-sized enterprises, the sector of plants, animals, food and feed, and European statistics.	€ 4,2 bn	a. The Internal Market: The SMP aims to ensure that citizens and businesses enjoy the benefits of the internal market and, through a range of tools, to ensure the citizens are aware of and can exercise rights and take full advantage of opportunities. b. Competitiveness (particularly of SMEs): The SME Strand of the SMP will provide various forms of support to businesses in order to foster a favourable business environment and culture, to support the uptake of innovation and to address global and societal challenges. c. Effective standards: The SMP will provide financial support to organisations that develop European wide standards to ensure that products and services meet an agreed level of quality and safety. d. Protect consumers: The SMP helps to assure that products on the market are safe and consumers know the rules and also helps national authorities to work efficiently together and communicate swiftly. e. Food Safety: Through the Food Strand, the SMP will prevent, control and eradicate animal diseases and plant pests, support sustainable food production and consumption, improve animal welfare, and enhance the effectiveness, efficiency and reliability of official controls. f. European statistics: : The SMP will provide funding to national statistics institutes for the production and dissemination of high-quality statistics to monitor the economic, social, environmental and territorial situation/circumstances.	

	EU	Public	#	Description	Amount	Detailed description
INTERRGIONAL INNOVATION INVESTMENTS INSTRUMENTS (I3)	EU	Public	1	1. Interregional 2. Innovation 3. Investments (See next column for detailed description.)	€ 570 million	1. Interregional: Creating links between EU regions around shared or complementary smart specialisation (S3) areas and involving all components of the regional or national innovation ecosystems. Supporting the development of value chains in less developed regions. 2. Innovation: Testing, demonstration, piloting, large-scale product validation and market replication, adaptation of existing prototypes. Accelerating innovation, bringing innovative solutions and new products to: Digital Transition, Green Transition and Smart Manufacturing. 3. Investments: Financial and advisory support for joint innovation projects Smart economic transformation by moving from investment ideas to actual implementation. Direct investment in companies (mainly SMEs). 10 million per project
Recovery and Resilience Fund (Greece 2.0)	EU	Public	2	The National Recovery and Resilience Plan includes an integrated and coherent set of reforms and investments structured along four (4) Pillars made up of eighteen (18) components	Total Sum of Grants: € 18,435 bn Total Sum of Loans: € 12,728 bn	Pillars: 1. Green transition. 2. Digital Transformation. 3. Employment, skills and social cohesion. 4. Private Investments and Transformation of the economy 4.5 Promote research and innovation = € 444 million. 4.6 Modernise and improve resilience of key economic sectors = € 3.74 bn. 4.7 Improve competitiveness and promote private investments and exports = € 5 million Subtotal of 4.5+4.6+4.7 components = € 4.19 bn

| Operational Programme Competitiveness 2021-2027 (Sectoral: horizontal, Country-wide) | EU | Public | 2 | The Competitiveness 2021-2027 Programme is an integrated intervention for the productive, competitive and outward-looking sectors of the economy in their transition to a knowledge-driven growth model, largely reflecting the country's growth priorities and in line with the new Commission priorities. The Programme is the tool for implementing the National Strategy for Smart Specialisation (NSIS), linking research and innovation to entrepreneurship and strengthening national and regional advantages. | €3.9 billion of public expenditure, of which €3.1 billion comes from the ERDF and ESF+ Community funds; sets priorities for strengthening the productive potential of the economy and related human skills. | Programme Actions are expected to achieve the following results: (i) Acceleration of transition to quality innovative entrepreneurship; (ii) *Supporting productive investments with a focus on innovation; (iii) Supporting productive transformation through innovation, technological adaptation, digital transformation and the shift to environmentally friendly processes and products; (iv) Developing the production of internationally tradable products and services; (v) Supporting new/startup high value-added entrepreneurship; (vi) Upgrading and qualitative modernisation of the tourism product; (vii) Supporting the development/adoption of innovations; (viii) Support services for entrepreneurship and creation of a favourable business environment; (ix) Accelerating the country's green and digital transition and technological development. The strategy of the Competitiveness Programme 2021-2027 is organised along four main investment axes under respective Funds. Strengthening Research and Innovation: The promotion of research and innovation is fully aligned with the country's strategy to place innovation at the heart of a sustainable and resilient recovery from the pandemic, to accelerate the green and digital transition and ensure Greece's technological growth. Similarly, human resources need to develop the skills needed to support upgraded business activity in all sectors. Interventions will focus on creating conditions and supporting initiatives for the development of industrial research, technology transfer, industrialisation of research results, startup entrepreneurship in the 8 areas of the National Strategy for Smart Specialisation (NSIS). Emphasis will also be placed on the development of innovation ecosystems with excellence objectives and medium- to long-term sustainable growth prospects to address the challenges of transformation and digitisation. At the same time, the Programme will seek to meet skills needs in the context of smart specialisation, industrial transition and support for digital transformation, with interventions that upgrade and certify competences of human resources in horizontal (Industry 4.0, green economy) and sectoral specialisations. |

European Maritime, Fisheries and Aquaculture Fund - Programme for Greece 2021-2027	EU	Public	2	The Programme aims to ensure that activities in the fisheries and aquaculture sectors are sustainable in the long term through environmental sustainability and subject to management that is compatible with the objectives of achieving economic and social benefits, as well as employment benefits.	€ 363. 75 million	The Programme serves the EU's Integrated Maritime Policy, as well as a number of international and European strategies and commitments, which set broader objectives for sustainable development, biodiversity, green transition and maritime governance.
Programme Crete (Regional)	EU	Public	3	Ibid.	€ 50.80 million	Priority 1: Promoting Innovation and supporting entrepreneurship (budget for research innovation and entrepreneurship not all priority, same as the rest of Regional Programmes)
Programme Eastern Macedonia - Thrace (Regional)	EU	Public	3	Ibid.	€ 48.34 million	Priority 1: Promoting Innovation and supporting entrepreneurship (for innovation and entrepreneurship)
Programme Central Macedonia (Regional)	EU	Public	3	Strategic Target: Strengthening and diversification of regional economy through exploitation of research and innovation: * Supporting organisations to develop excellence through	€ 149.83 million	Priority 1: Productive competitive transformation of Central Macedonia (budget for research innovation and entrepreneurship not all priority, same as the rest of Regional Programmes)

Programme				supporting research infrastructures * Strengthening partnerships between the research sector and business * Digital entrepreneurship * Strengthening the competitiveness and extroversion of SMEs			
Programme West Macedonia (Regional)	EU	Public	3		Ibid	€ 25.50 million	Priority 1: Strengthening the productive and economic transformation of the Region (for innovation and entrepreneurship)
Programme Ionian Islands (Regional)	EU	Public	3		Ibid	€ 22.60 million	Priority: 1. Strengthening regional competitiveness through the promotion of entrepreneurship, innovation & digital economy (for innovation and entrepreneurship)
Programme Epirus (Regional)	EU	Public	3		Ibid	€ 44.30 million	Priority: 1. Strengthening the regional economy by exploiting research and innovation (budget for research innovation and entrepreneurship not all priority)
Programme Thessaly (Regional)	EU	Public	3		Ibid	€ 57.23 million	Priority: 1. Strengthening the regional economy by exploiting research and innovation
Programme Sterea Ellada (Regional)	EU	Public	3		Ibid	€ 40.8 million	Priority 1: Enhancing the competitiveness and extroversion of the economy by promoting innovation and smart regional transformation
Programme Attiki (Regional)	EU	Public	3		Ibid	€ 68.90 million	Priority: 1. Strengthening the competitiveness and extroversion of the regional economy through the promotion of innovative and innovative products and services. Promoting innovative and smart economic and digital transformation
Programme Peloponissos (Regional)	EU	Public	3		Ibid	€ 40.26 mio	Priority: 1. A more competitive and smarter Europe by promoting innovative and smart economic transformation, and regional digital interconnectivity

Programme North Aegean (Regional)	EU	Public	3	Ibid	€ 37.01 million	Priority 1: Transforming the Region's economy by increasing the size and productivity of businesses, mainly through smart specialisation
Programme Notio Aigaio (Regional)	EU	Public	3	Ibid	€ 9.0 million	Priority: 1. Strengthening competitiveness and productive potential of the Region
Programme Dytiki Ellada (Regional)	EU	Public	3	Ibid		

CAUSES OF THE RECENT INFLATION IN GREECE AND SUGGESTIONS FOR THE FUTURE

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Abstract

The paper explains the evolution of the general price level in Greece from 2010 onwards, in terms of aggregate demand and aggregate supply shifts; empirically analyzes the evolution of prices from 2000 onwards in terms of the long-term trend, the currency changeover, seasonal sales periods, intermediate deviations from the trend (due to taxes, the pandemic, the war in Ukraine/energy crisis, and increased post-pandemic spending), the minimum wage, the ECB interest rate, as well as the price of agricultural inputs; and provides policy suggestions based on the paper's explanations and findings.

Keywords

Prices & inflation, trend-seasonal-cyclical effects, impact of currency changeover, sales periods, minimum wage, ECB interest rates, agricultural inputs, pandemic lockdowns & post-pandemic spending, war in Ukraine & energy crisis, aggregate demand & supply

JEL Classifications: E31, C22

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1. Introduction

The sharp increase in price inflation from 2021 onwards in many advanced econo-mies is attributed primarily to the pandemic lockdowns, and the Russian invasion of Ukraine. The first development adversely affected production and supply chains around the globe, causing shortages and a contraction of the aggregate supply. It also triggered fiscal and monetary expansion to support households and businesses affect-ed by the lockdowns, resulting in an expansion of the aggregate demand. *Ceteris pa-ribus*, a contraction of the aggregate supply or an expansion of the aggregate demand drives prices up. The latter development adversely affected the production capacity of Russia and Ukraine and, hence, the overall supply; while sanctions on Russia, es-pecially against Russia's energy products, intensified the demand for critical energy commodities produced elsewhere around the world for several months. Together, the two developments pushed international prices up too. Climate-related disasters, busi-ness practices aiming to raise profits in certain industries, even a tool employed by the EU Commission to ensure duty revenues from imports, may have aggravated the situation, and one suspects that the resurgence of tensions in the Middle East and the Red Sea may have also adversely affected global supply chains and energy com-modities prices (e.g., OECD, 2022; Andersen, 2023; European Commission, 2023; Hahn, 2023; Hansen et al., 2023; Matthews, 2023; Arce et al., 2024; Prodromidis and Lappas, 2024).

Inflationary developments in the small open eurozone economy of Greece fit into the narrative above. However, the evolution of macroeconomic variables from 2010 onwards shows that in the wake of the country's sovereign debt crisis of 2009-10 and a series of reform and austerity measures (as therapy), real Gross Domestic Product (GDP) per capita declined for a long time, while prices remained relatively stable or declined, and only lately real GDP per capita returned to the 2010-11 level and prices increased. See Figure 1.

The rest of the paper further probes the issue to reach actionable insights. In par-ticular, Chapter 2 describes the said macroeconomic developments in Greece in terms of aggregate supply and aggregate demand shifts. Chapter 3 discusses the factors considered in the empirical analysis of the country's Consumer Price Index (CPI) from 2000 onwards, and Chapter 4 presents the results. Chapter 5 empirically stud-ies the evolution of major consumer price sub-indices over the same time-frame and presents the results. Chapter 6 discusses the results and policy recommendations, and Chapter 7 concludes.

2. Macroeconomic developments

The evidence provided in Figure 1 suggests that reductions on the supply side dur-ing 2010-12 (i.e., a shift of the aggregate supply schedule to the left) dominated the changes that occurred on the demand side (shifts that occurred on the aggregate de-

mand schedule). See Figure 2, movement type A. This resulted in a steep reduction in output (income) and a small increase in the general price level.

Figure 1: The evolution of real per capita GDP and prices in Greece, 2010-23
Price
(GDP deflator, 2010=100)

GDP per capita in terms of 2010 price (€)
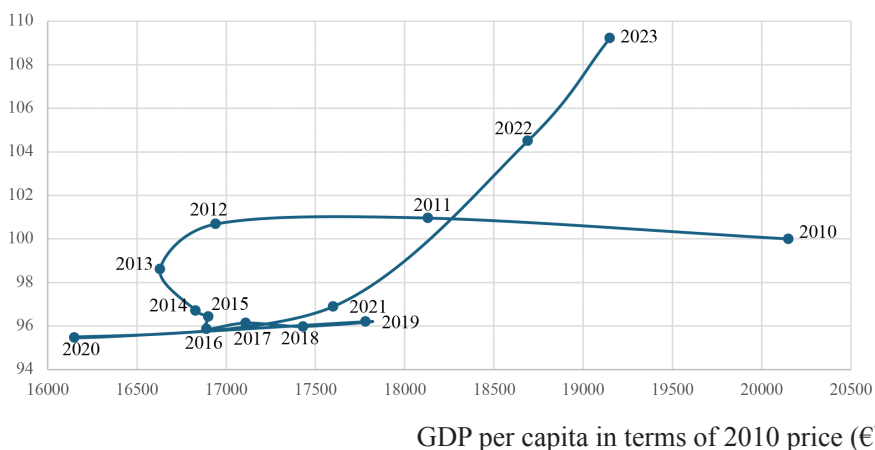
Source: Eurostat (as updated on Jan.15 2024).

Figure 2: The four cases of dominant aggregate supply and demand (AS, AD) shifts in Greece, 2010-23
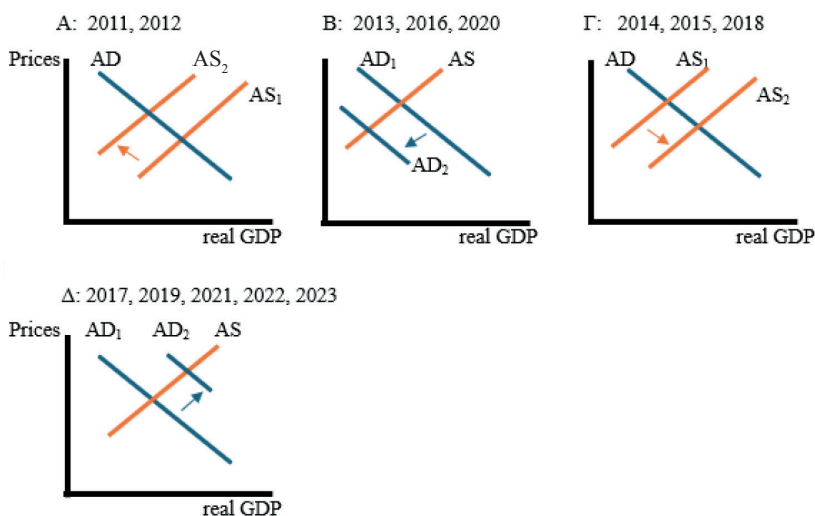
Note: The economy operates away from full employment.

Subsequently, a leftward shift (contraction) of the aggregate demand schedule dominated shifts that occurred on the aggregate supply schedule (movement type B). This resulted in a reduction in income and prices in 2013.[1]

Then the situation changed. The rightward shift of the aggregate supply dominated shifts that occurred on the aggregate demand front (movement type C). This resulted in higher income and lower prices in both 2014 and 2015 despite capital controls imposed in mid-2015.[2] By 2016 the contraction of the aggregate demand dominated developments on the aggregate supply front (movement type B); in other words, both income and prices decreased.

The following year the aggregate demand moved in the opposite deirection dominating the shifts that occurred on the aggregate supply front (movement type D). This resulted in a simultaneous increase in both income and prices in 2017. It was succeeded by C and D type movements in 2018 and 2019, respectively.

The succession of small income gains was halted with the advent of the deadly coronavirus pandemic in 2020, as lockdowns and other restrictions were imposed on social and economic activities to prevent contagion. At the same time, reductions in private spending and service exports led to a contraction of the aggregate demand schedule which dominated the shifts that occurred on the aggregate supply front (movement type B).

This was followed by a massive inflow and use of financial resources[3] to ensure coping with the consequences of the pandemic, of the energy crisis, and of natural disasters, as well as to pave the way for increased production in the future (movement type D). This resulted in considerable output growth during 2021, 2022 and 2023 compared to previous years.

It follows that the ongoing rise in the cost of living experienced in Greece is to considerable extent inextricably linked with the ongoing economic boom. Without ignoring the high monetary cost of weaning off Russian energy products and its negative consequences on Greece's output, what prevails is a type D movement. In many respects the situation is preferable to the situations of movement types A or B.

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1. *Ceteris paribus,* the aggregate demand falls (the aggregate demand schedule shifts left) with fiscal or monetary contraction (such as a reduction in government spending, a decrease in the money supply, a rise in interest rates) and rises with fiscal or monetary expansion. See Begg et al. (2008: 472-475).

2. *Ceteris paribus*, the aggregate supply increases (the aggregate supply schedule shifts to the right) when more or better inputs (labor, machinery, etc.) enter production, when the way these are combined in the production process improves, when distortions in inputs or final products markets are removed; while the aggregate supply decreases when the opposite happens. See Begg et al. (2008: 484).

3. Through EU co-funded programs, the public investment program, foreign direct investments, the new Recovery and Resilience Fund (RRF) etc.

3. Data considerations and choices

To further probe what affected and keeps affecting the evolution of prices in Greece, we turn to the empirical analysis of the CPI. Of the two available price measures, the GDP deflator (supplied by Eurostat, the statistics office of the European Union) and the CPI (supplied by ELSTAT, the statistics authority of Greece):

- The GDP deflator is a measure of the monetary price of all new, domestically produced final goods and services (hence, it is not affected by increases in the prices of imported goods and services) and it is estimated on an annual basis.
- The CPI is a measure of the monetary price of a basket of goods and services purchased by consumers in the country−whether the said goods and services are domestically produced or not, it is hence, to some or considerable degree, affected by increases in the prices of imported goods and services−and it is estimated on a monthly basis.

The former is not based on a fixed basket of goods and services (in fact, the basket is allowed to change from year to year with people's consumption and investment patterns, as they substitute expensive goods and services with less expensive ones), while the latter is based on a fixed basket of goods and services. This means that the CPI is likely to overestimate the rise in prices relative to the GDP deflator. Accordingly, as illustrated in Figure 3, where both price measures are set to commence from the same base year, the CPI by-and-large overtakes the GDP deflator. The CPI also allows the analysis to be carried out with many more observations: Where the GDP deflator has 13 or 25 annual observations the CPI has 168 or 300 monthly observations. So. from this viewpoint, the latter is more suitable for empirical analyses.

Figure 3: Evolution of the annual GDP deflator and of the monthly CPI in Greece (2010 =100), 2010-23
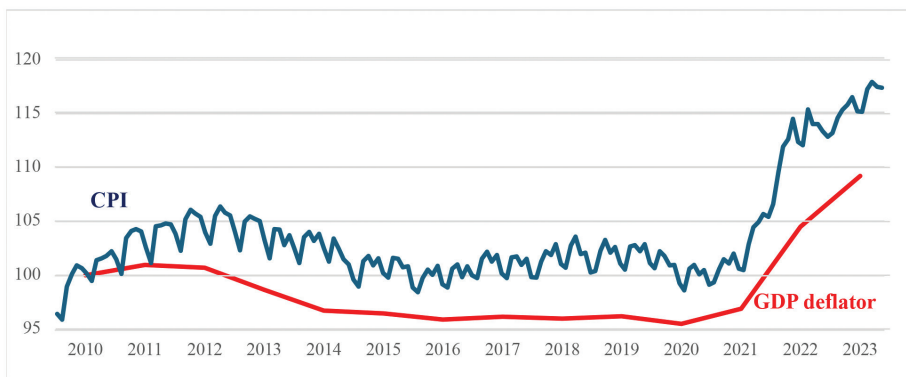
Source: Eurostat (GDP deflator, dated 1.15.2024) and ELSTAT (CPI, dated 10.6.2024), author's own calculations.

Economic theory and empirical analyses suggest that prices are affected by: (a) Changes in the aggregate supply, such as changes along the inputs-production-sales-and-after sales service support value chain (e.g., changes in input prices, in competition, in markups, in minimum wages). (b) Changes in the aggregate demand, such as changes in monetary or fiscal policy (e.g., in interest rates, tax rates, public spending). (c) Unexpected anomalies in the above (e.g., in the case of war or epidemic) as already mentioned in the Introduction. (d) Seasonal and cyclical features of the above. See Lemos, 2008; Coibion et al., 2015; Petralias and Prodromídis, 2015; Bodnár et al., 2018; Harasztosi and Lindner, 2019; Ferrara et al., 2021; Kouvaras et al., 2021; Caldara et al., 2022; Bernardini and Lin, 2023; Di Giovanni et al., 2023; and the sources cited therein.

Of these likely explanatory factors, the analysis that follows takes into account via binary categorical variables a number of events that took place: the euro-changeover in early 2002, seasonal discounts (mid-season sales periods),[4] the introduction of additional short sales periods in the autumn of 2013 in an attempt to offset consumer losses at a time real income dropped, the cancellation of the said short sales periods in the spring of 2022 at the request of sellers, a dramatic consumer tax increase in the autumn of 2012, the substantial distribution of subsidies to counter the said increase in the autumn of 2014, the pandemic, the war in Ukraine that also coincided with considerable post-pandemic spending by the RRF and other resources.

In the empirical analysis these factors are supplemented by three continuous variables. The first of these is the interest rate associated with overnight credit to banks, a key monetary policy instrument employed by the European Central Bank (ECB). It is in the form of a time-series that runs from January 1999 onwards and is made available by the ECB. The ECB has been in charge of the EU's monetary policy as of 1998. One of its tasks was to put into circulation euro banknotes and coins in January 2002. Another task is to maintain a 2% inflation rate across the eurozone over the medium term. So, the ECB often manipulates the said interest rate with the understanding that, *ceteris paribus*, the rate's rise (or fall) makes borrowing more expensive (or cheaper), resulting in less (or more) money circulating in the market, thus reducing (or raising) the demand for goods and services and bringing about lower (or higher) prices. The price measure considered by the ECB is the Harmonised Index of Consumer Prices (HICP). This is based on a basket of goods and services, representing the consumption of all private households in the member states, and its broad EU-27-wide version frequently moves similarly to the Greek CPI (see Figure 4). However,

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4. Only some of the discounts and offers enter the CPI. Especially, reduced prices due to offers or discounts applicable to certain categories of consumers, offers made by making a product available as a gift, offers made through cards or coupons, offers made on products close to their expiration dates, are not considered when calculating the CPI.

Figure 4: Evolution of the HICP and of the Greek CPI (CPI-GR), Dec.1999-Apr.2024 (2005=100)
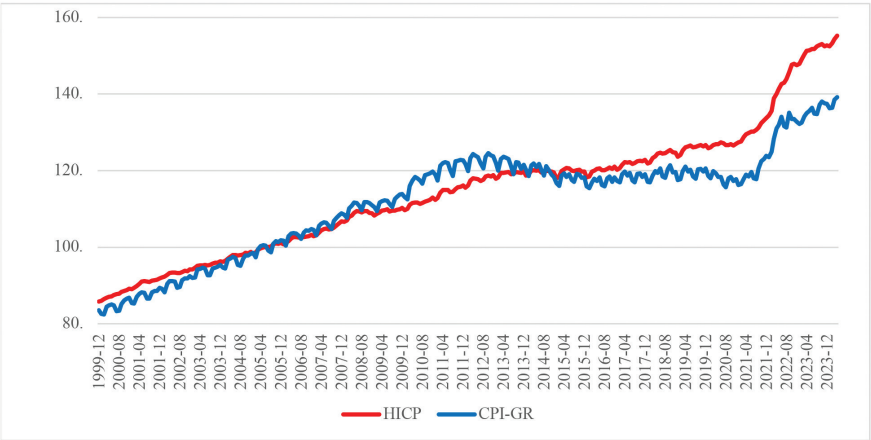
Source: Eurostat (HICP, dated 31.05.2024), ELSTAT (CPI-GR, dated 10.06.2024), author's own calculations.

the inflation target is not based on the Greek CPI, so changes in the Greek CPI do not systematically precede interest rate changes. See Table 1.

Table 1: Granger causality tests of the null hypothesis that Greek CPI changes do not systematically predict ECB interest rate changes, Jan.1999-May 2024

Lags	P-value	Lags	P-value	Lags	P-value	Lags	P-value	Lags	P-value	Lags	P-value
1	0.162	8	0.356	15	0.461	22	0.427	29	0.454	36	0.750
2	0.311	9	0.402	16	0.545	23	0.486	30	0.527	37	0.814
3	0.148	10	0.269	17	0.581	24	0.546	31	0.530	38	0.841
4	0.190	11	0.396	18	0.528	25	0.562	32	0.501	39	0.889
5	0.140	12	0.357	19	0.532	26	0.567	33	0.606	40	0.898
6	0.191	13	0.375	20	0.308	27	0.504	34	0.657		
7	0.223	14	0.392	21	0.309	28	0.519	35	0.741		

The probability of error is never small, so there is no evidence against the null hypothesis.

Sources: ELSTAT (CPI data dated 10.06.2024), ECB (interest rate data accessed on 10.6.2024), author's own calculations.

The second continuous explanatory variable employed functions as a policy instrument, too. It is the minimum wage. Unlike the equilibrium wage, which is shaped by labor market forces, the minimum wage is set by the government. It takes the form of a price floor below which employees may not sell their labor. When this floor is set above the equilibrium wage, then, *ceteris paribus*, employment decreases, and output and the aggregate supply fall (e.g. by Begg et al., 2008: 204-206.) While Greece does

not have an automatic wage indexation system for all (abolished in 1990), the minimum monthly wage has gone from € 505.1 in May 1999 to € 968.3 in April 2024 via 22 increments and one reduction (from € 876.6 to € 683.8 in December 2012). At the EU-level an attempt is made to establish a framework for adequate minimum wages across member-states (European Union, 2022), but, as it appears from the Greek CPI and minimum wage time-series,[5] CPI changes systematically precede changes in the minimum wage, perhaps by 25 or 36-37 months, probably by 38-39 months. See Table 2.

Table 2: Granger causality tests of the null hypothesis that CPI changes do not systematically predict minimum wage changes in Greece, Jan.1999-May 2024

Lags	P-value	Lags	P-value	Lags	P-value	Lags	P-value	Lags	P-value	Lags	P-value
1	0.340	8	0.624	15	0.421	22	0.333	29	0.050	36	0.014
2	0.312	9	0.312	16	0.485	23	0.102	30	0.054	37	0.017
3	0.389	10	0.159	17	0.540	24	0.115	31	0.065	38	0.004
4	0.035	11	0.172	18	0.613	25	0.015	32	0.032	39	0.008
5	0.035	12	0.297	19	0.672	26	0.038	33	0.034	40	0.013
6	0.303	13	0.290	20	0.575	27	0.044	34	0.043		
7	0.457	14	0.383	21	0.285	28	0.040	35	0.040		

The probability of error is small (1-2%) at the 25th and 36-37th lag, and very small (less than 1%) only in the last entries of the last column. It is in them that we have the strongest evidence against the null hypothesis.
Sources: ELSTAT (CPI data dated 10.06.2024), ESSE and Country Economy (minimum wages accessed on

The third continuous explanatory variable is the input price index in agriculture, made available by ELSTAT. Its monthly figures run from January 2000 onwards,[6] and are based on the intermediate consumption of goods and services (fertilizers, pesticides, fodder, seeds, energy and lubricants, maintenance and repairs, etc.) and purchase of fixed capital (machinery and equipment, farms, buildings, etc.) used in the production of crops, poultry and livestock commodities for food and fiber. Changes in the index seem to follow changes in the CPI (same direction) with a six-month lag. See Table 3. Interestingly, no such temporal precedence appears in the semi-annual data for at least ten lags (semesters).

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5. The latter is constructed here from the relevant tables of the ESSE (2024) *and of the* Country Economy (2024).

6. As a result, a small number of observations is removed.

Table 3: Granger causality tests of the null hypothesis that CPI changes do not systematically predict input price index changes in agriculture in Greece, Jan.2000-May 2024

Lags	1	2	3	4	5	6	7	8	9	10
P-value	0.834	0.354	0.456	0.042	0.018	0.010	0.021	0.027	0.043	0.063

The probability of error is very small (0.0095%) at the 6th lag.
Source: ELSTAT (CPI data dated 10.06.2024; input price index data dated 15.07.2024), author's own calculations.

To the extent the three said variables are affected by the CPI some or several periods later or not at all, it is quite appropriate to explain the patterns of the CPI in terms of concurrent minimum wages and agricultural input prices and slightly earlier (lagged) ECB interest rates.[7]

The analysis is carried out both in terms of levels and in terms of first differences. (See Tables 4A and 4b, respectively.) In the latter, the continuous variables are uncorrelated with one another (the highest correlation coefficient is $\rho < 3\%$). However, this is not the case in the former and, therefore, in order to disentangle the separate influences, in the analysis all three continuous variables are rendered uncorrelated with each other:[8] They are run net (i.e., as residuals) of the other factors−i.e., the factors previously considered in the analysis, to be exact.

In both versions the regressands (the CPI or its first difference, the ΔCPI), their immediate lags, the regressors and the immediate lags of the regressors turn out to be either modestly or negligibly correlated with the respective regression residuals.[9] In addition, the Ramsey Regression Equation Specification Error Tests (RESET) suggest that the models are not missing any non-linear combinations of the explanatory variables, and the overall explanatory power of either model (the R^2 and adj.R^2) turns out to be high.

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7. For it may take some time for the impact of the ECB's interest rate to pass through.

8. Thus, the impact of confounding factors and of double counting of common features, such the minimum wage effects on the agricultural cost mix, is prevented. (The correlation coefficient, ρ, between the minimum wage and the input price index in agriculture is equal to 75%).

9. $\rho_{CPIt,ut} = \rho_{CPIt-1,ut} = 9\%$, $\rho_{\Delta CPIt,ut} = 52\%$, $\rho_{\Delta CPIt-1,ut} = 44\%$, $\rho_{\#10t-3,ut} = 3\%$, $\rho_{\#11t-3,ut} = -8\%$, $\rho_{\#12t-2,ut} = -3\%$, $\rho_{\#10't-3,ut} = 12\%$, $\rho_{\#11't-2,ut} = 7\%$, $\rho_{\#12t-3,ut} = 8\%$.

Table 4: Econometric analysis of the monthly CPI in Greece, Jan. 2000 – May 2024 (2020=100)

A. With the CPI as regressand

1	Autonomous component (initial level)	68.67
2	Autonomous component for the new currency (binary variable, set to one from Jan. 2002 onwards)	13.35
3	Time trend up to the currency changeover (i.e., up to Dec. 2001)	0.20
4	Time trend from Jan. 2002 onwards	0.12
	Seasonal effects (binary variables)	
5	Winter and summer sales: January-February & July-August	-1.97
6	Intermediate sales: November & May (in effect from Nov.2013-May 2021)	-2.42
	The most intense cycle-phases (binary variables)	
7	Jan.2013 (3 months after a 450% tax increase in heating oil) [a] – Oct.2014 (subsidy distribution)	4.72
8	Apr.2020 (1 month after the pandemic's first lockdowns in Greece) – Jan.2022 (¾ of adults vaccinated so restrictions were lifted)	-7.34
9	Feb. 2022 (Russian invasion of Ukraine, energy crisis etc.; considerable public spending)	2.55
	Other factors (binary variables)	
10	Minimum wage as a residual (i.e., net) of all previous factors, from Jan. 1999 onwards	0.04
11	ECB marginal lending rate to banks (3 lags) as a residual (i.e., net) of all previous factors, from Mar. 1999 onwards	-0.43
12	Input price index in agriculture as a residual (i.e., net) of all previous factors	0.36

$N = 293$. $R^2 = 99.3\%$. adj. $R^2 = 99.2\%$. Ramsey RESET p-value = 17.1%.

B. With the ΔCPI (first differences of the CPI) as regressand

1′	Autonomous component	0.17
2′	Introduction of new currency (binary variable, set to one for Jan. 2002)	0.29
	Seasonal effects (binary variables)	
3′	Winter and summer sales: January-February & July-August	-1.05
4′	Intermediate sales: November & May (in effect from Nov.2013-May 2021)	-0.91
5′	March, April, September	1.35
	Other temporal effects - cycle-phases (binary variables)	
6′	Jan.2013 (3 months after a 450% tax increase in heating oil) [a]	0.68
7′	Oct.2014 (outset of considerable distribution of heating oil subsidies)	-0.01
8′	Apr.2020 (1 month after the pandemic's first lockdowns in Greece)	-1.81
9′	Feb. 2022 (Russian invasion of Ukraine, energy crisis etc.; considerable public spending)	1.28
	Other factors (first differences of continuous variables)	
10′	Minimum wage	0.01
11′	ECB marginal lending rate to banks (3 lags)	-0.18
12′	Input price index in agriculture	0.22

$N = 292$. $R2 = 72.8\%$. adj. $R2 = 71.7\%$. Ramsey RESET p-value = 7.6%.

[a] An indirect tax increase affects the economy not when it is levied, but when a good number of consumers purchase the product on which the tax was levied or turn to its substitutes. In this case, the 4th quarter of 2012 in Attica (the most populous region of Greece) was both warmer than the quarter that followed, and warmer than the 4th quarters of 2011 and 2013. This means that, in all likelihood, the purchase of large quantities of heating oil was postponed for a few months.

The analysis is carried out with robust standard errors. The p-values associated with coefficients #2́, 6́, 7́, 10́, 11́ are equal to 0.025, 0.324, 0.964, 0.037, 0.417, respectively, and the rest equal zero. However, p-values are only useful in sample-based analyses. The present analysis is not based on samples.

Sources: ELSTAT (CPI data dated 10.06.2024, input price index data dated 15.07.2024), ECB (lending rates from 1999 on, accessed on 10.6.2024), ESSE and Country Economy (minimum wages accessed on 28.06.2024), own calculations.

4. Econometric findings

The econometric analysis of the monthly CPI from 2000 to May 2024 (in Table 4A) suggests that prices:

- Increased over time, rose further during (or very shortly after) the currency changeover, and continued to increase over time (rows 2-4). By and large, this upward trend is in line with the ECB target of a small positive inflation rate over the medium term.
- Feature both seasonal and cyclical elements: (a) Systematically decreased during the winter and summer sales (in January-February and July-August) and during the short (intermediate) autumn and spring sales (in November and May, respectively) that run from the autumn of 2013 to the spring of 2022 (rows 5-6). Restoring these elements is an option if policymakers wish to alleviate inflation. (b) Increased considerably (above the trend) after a 450% tax hike on heating oil in 2012 up to the distribution of subsidies to a large share of the consumer base in 2014 (row 7). (c) Decreased considerably (below the trend) in the spring of 2020 when the coronavirus pandemic reached Greece (row 8). (d) Increased considerably from the time of the Russian invasion of Ukraine in late winter of 2022 onwards (i.e., with the international sanctions against Russia's energy products and increased demand for substitutes, as well as the inflow of substantial RRF resources, see row #9).
- Moved in the same direction as the minimum wage and the prices of agricultural inputs (see rows 10 and 12) and in the opposite direction of the ECB interest rate (row 11).

The econometric analysis of the CPI in terms of first differences (Table 4B), also features parts:

- below the trend: seasonally during sales (rows 3´-4´), also after the heating oil subsidy distribution (row 7´) and in the wake of the first pandemic lockdowns (row 8´), as well as
- above the trend: seasonally in March-April and September (row 5´), also after the heating oil tax increase (row 6´) and the Russian invasion of Ukraine that coincided with considerable public spending (row 9´).

It also indicates that the CPI changes in the same direction as the minimum wage and the prices of agricultural inputs change (rows 10´ and 12´), and in the opposite direction of the ECB interest rate change (row 11´).

Consequently, if policy makers wish to reduce inflationary pressures, they have a range of options: to re-establish the short autumn and spring sales, to refrain from

indirect tax and minimum wage increases and to provide subsidies to low-income residents and those in need, to reduce government spending, to affect the reduction of agricultural input prices. In fact, it may be more effective to try several of the above together.

5. The evolution of various consumer price sub-indices

To gain insights into the evolution of monthly prices at a more disaggregated product level (across major groups of goods and services), Table 5 displays the estimated respective trend, seasonal and currency-changeover effects, as well as effects associated with the intense cycle-phases identified in Table 4. The finding suggest that:

- Prior to the changeover, prices in hotels-cafés-restaurants reached the highest upward trend, and only prices in communications showed a downward trend (row 3). Then, during or shortly after the currency changeover prices in all categories, especially in education, rose, and only prices in communications dropped (row 2). Subsequently, prices in nearly all categories, especially in alcoholic beverages-tobacco, presented upward trends, prices in communications and in recreation-culture downward trends, while prices in durable goods etc. negligible change (row 4).
- During summer and winter sales and March, prices in clothing-footwear fell considerably (column 3).
- During the heating oil tax hike prices increased, primarily in housing, followed by transport, clothing-footwear, and miscellaneous goods and services, etc. (row 7).
- During the pandemic prices decreased considerably in nearly all categories, especially in housing, not so much in food etc., and rose little in communications (row 8).
- During the (ongoing) war in Ukraine and the influx of RRF resources, food prices rose considerably, followed by transport prices, while alcoholic beverages-tobacco prices fell considerably followed, by education and miscellaneous goods-services prices (row 9).

To the extent the downward price trend in communications stands out, it might be worth to consider introducing in more sectors of economic activity, a policy planning and development agency that also operates as competition authority ─similar to the case of the communications sector.

6. Discussion

The current inflation is to some extent an integral part of the ongoing economic boom, and insofar as the real per capita product is rising, the situation is preferable to that of a recession. However, of the four paths that the economy can take, the most advantageous one in terms of real output and prices is that dominated by a rightward shift of the aggregate supply. This may be achieved:

Table 5: Estimates of the trend and seasonal effects, and of the effects of the cyclical features identified in Table 4 on the monthly CPI components in Greece, Jan. 2000 – May 2024 (2020=100)

Variables (numbered as in Table 1)	Food, non alcoholic beverages (1)	Alcoholic beverages, tobacco (2)	Clothing, footwear (3)	Housing (4)	Durable goods, household appliances & services (5)	Health (6)	Transport (7)	Communications (8)	Recreation, culture (9)	Education (10)	Hotels, cafés, restaurants (11)	Miscellaneous goods & services (12)
1 Initial level	66.62	40.26	88.37	55.91	95.66	70.10	63.78	125.93	91.49	74.67	59.34	82.42
2 Using € (from 2002 on)	13.25	6.06	16.61	12.05	14.72	17.10	7.97	-27.18	18.86	22.05	16.11	18.82
3 Trend up to Dec.2001	0.19	0.19	0.11	0.18	0.15	0.18	0.19	-0.56	0.18	0.22	0.23	0.21
4 Trend subsequently	0.11	0.26	0.04	0.21	-0.00	0.08	0.17	-0.01	-0.01	0.05	0.13	0.04
Seasonal effects												
• January	0.57	0.11	-17.11	-0.56	-2.55	-0.36	-0.45	0.54	-0.69	-0.73	-0.29	-0.93
• February	0.28	0.03	-26.32	-1.03	-4.49	-0.37	-0.28	0.38	-0.84	-0.89	-1.12	-1.41
• March	0.35	-0.04	-5.86	-0.75	-0.99	-0.26	0.86	0.23	-0.71	-0.96	-1.00	-0.72
• April	0.80	0.39	-0.62	-0.21	-0.53	0.08	1.59	0.28	-0.32	-0.73	-0.04	-0.13
• May	0.66	0.74	-4.08	-0.46	-0.64	0.18	1.94	0.36	-0.44	-0.80	0.02	-0.26
• June	-0.23	0.81	-0.96	-0.45	-0.37	-0.15	2.49	0.45	-0.54	-0.97	-0.19	-0.57
• July	-1.27	0.78	-16.82	-0.58	-2.87	-0.12	2.54	0.49	-0.65	-1.04	-0.22	-1.02
• August	-1.14	0.56	-23.81	-0.61	-4.17	-0.04	1.98	0.62	-0.73	-1.11	-0.30	-1.15
• September	-0.72	0.57	-1.15	-0.45	-0.41	0.05	1.29	0.62	-0.47	-0.03	0.00	-0.54
• October	-0.34	0.49	0.43	-0.29	-0.15	0.08	1.07	0.60	-0.32	0.04	-0.21	-0.45
• November	-0.16	0.44	-3.65	0.49	-0.27	-0.01	0.62	0.46	-0.25	0.10	-0.51	-0.31
• December (ref.)												
In the intense cycle phases												
7 Jan.2013-Oct.2014	2.11	2.59	6.63	16.71	3.25	0.10	6.66	-3.61	2.33	2.92	0.72	6.62
8 Apr.2020-Jan.2022	-3.89	-7.60	-8.20	-12.35	-9.11	-5.85	-9.12	2.56	-7.28	-7.52	-6.28	-11.33
9 Feb.2022 onwards	14.57	-10.76	0.01	3.18	2.78	-2.59	5.86	-1.74	-3.27	-5.25	1.14	-7,63
N: 305 R²:	94.43%	98.61%	75.03%	92.05%	48.22%	84.02%	92.07%	84.63%	55.64%	60.61%	94.95%	58.72%

The analysis is carried out with robust standard errors. Regarding p-values: P-values are only useful in sample-based analyses. This analysis is not based on samples. However, the p-values are provided below per column for those readers who wish to view them: (1) 0, 0, 0, 0, 0.536, 0.761, 0.708, 0.384, 0.473, 0.808, 0.171, 0.22, 0.44, 0.717, 0.863, 0.005, 0, 0. (2) 0, 0, 0, 0, 0.87, 0.97, 0.95, 0.578, 0.289, 0.249, 0.263, 0.425, 0.414, 0.488, 0.526, 0, 0, 0. (3) 0, 0, 0.325, 0, 0, 0, 0.003, 0.751, 0.038, 0.626, 0, 0, 0.56, 0.83, 0.064, 0, 0, 0.997. (4) 0, 0, 0.051, 0, 0.734, 0.533, 0.648, 0.899, 0.781, 0.787, 0.726, 0.713, 0.784, 0.86, 0.766, 0, 0, 0.036. (5) 0, 0, 0.067, 0.886, 0.074, 0.002, 0.49, 0.712, 0.655, 0.8, 0.046, 0.004, 0.774, 0.917, 0.853, 0.005, 0, 0.035. (6) 0, 0, 0.004, 0, 0.745, 0, 0.74, 0.816, 0.944, 0.875, 0.898, 0.918, 0.969, 0.966, 0.946, 0.992, 0.909, 0, 0.012. (7) 0, 0, 0.009, 0, 0.727, 0.825, 0.5, 0.212, 0.128, 0.053, 0.049, 0.124, 0.317, 0.407, 0.629, 0, 0, 0. (8) 0, 0, 0, 0, 0.494, 0.636, 0.774, 0.723, 0.654, 0.578, 0.542, 0.441, 0.437, 0.45, 0.566, 0, 0.001, 0.018. (9) 0, 0, 0.015, 0.009, 0.587, 0.509, 0.579, 0.805, 0.733, 0.677, 0.615, 0.574, 0.715, 0.804, 0.845, 0.025, 0, 0.047, 0, 0.698, 0.637, 0.611, 0.698, 0.671, 0.61, 0.584, 0.56, 0.987, 0.983, 0.958, 0.057, 0. 0.003. (11) 0, 0, 0, 0.74, 0.204, 0.256, 0.963, 0.983, 0.828, 0.802, 0.732, 0.996, 0.81, 0.561, 0.312, 0, 0.161. (12) 0, 0, 0.038, 0, 0.587, 0.411, 0.676, 0.941, 0.878, 0.744, 0.557, 0.505, 0.753, 0.796, 0.858, 0, 0, 0.

Source: ELSTAT (CPI components, dated 10.06.2024), author's own calculations.

- by retaining workers past retirement, upgrading workforce skills to fill job vacancies or inviting people who have the necessary skills and competencies from overseas;
- by removing obstacles to start ups, and by facilitating research and development, technological improvement, the accumulation and diffusion of knowledge to producers and workers, and the creation of more value in all production phases and after production;
- by producing exportable goods and services that appeal to high income foreign markets;
- through improvements in private sector (business) strategic development planning and management practices, and by stimulating healthy competition in as many domestic sectors of economic activity as possible,[10] while allowing natural monopolies to produce large quantities at low cost in the remaining sectors;
- by avoiding practices that restrict the aggregate supply (e.g., increases in minimum wages), and offering instead other types of support (e.g., subsidies) that do not reduce employment;
- by reducing employer contributions and income taxation so as to raise employment and production, as long as this does not compromise macroeconomic stability and fiscal sustainability.[11]

And if policy makers wish to further reduce price inflation, they can opt to re-establish the short autumn and spring sales, refrain from indirect tax increases, affect the reduction of agricultural input prices by encouraging practices that promote more efficient uses of resources and coordinated bulk purchasing or by helping raise the supply of (domestically made and imported) inputs and farmers' access to relevant information and to networks of distribution-transportation, and so on.

7. Conclusion

The ECB, through its monetary policy tools, will bring the inflation of the Eurozone to the level it desires (around 2%). Understandably, individual countries may deviate from the average to different extents. To the degree Greece needs to catch up (converge) fast to the rest of the EU-27, carrying out additional expenditures so at to upgrade the country's production capacity, energy production-distribution-storage, and functional integration, the aggregate demand schedule is bound to shift to the right.

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10. As opposed to repealing such deregulation (e.g., the 2018 annulment of the 2014 fixed book price amendment). See Kontolaimou et al. (2019) and Prodromidis (2020).

11. See Cloyne et al. (2023). While the imposition of taxes reduces production, hence, the aggregate supply (e.g., by Begg et al., 2008: 70-71), removing taxes does not necessarily restore things to their original state of affairs. Especially the reduction of indirect taxes requires extra attention. See Benzarti et al. (2020).

This will impede the reduction of prices affected by the proposed move of the aggregate supply schedule to the right. So, every single additional idea or plan regarding the reduction of prices will have to be considered: From bringing back mid-season sales and refraining from indirect taxation and minimum wage increases, to providing subsidies instead (preferably subsidies to goods and services associated with large multipliers), affecting the reduction of agricultural inputs prices, monitoring sectors that purposely keep prices high to boost profits and introducing competition in these sectors, even questioning the EU Commission's tool that raises the prices of imports. Studies that explore other aspects may offer additional recommendations, but the ones listed above are good places to start.

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EFFECTIVENESS OF INCLUSIVE GROWTH STRATEGIES ON POVERTY REDUCTION IN SUB-SAHARAN AFRICA

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Abstract

This paper examines the efficacy of inclusive growth strategies in reducing poverty in SSA. The study specifically analyses the effect of economic, social, and institutional inclusiveness on poverty level from 2000 to 2022 for a panel of eighteen (18) lower middle-income countries in SSA. Data were analysed using the Differenced Generalised Method of Moments. Results revealed that inclusive growth leads to reduction of poverty level in the case of higher inclusive growth, suggesting the potency of inclusiveness economic growth may well contribute towards stemming poverty. However, the potential of inclusive growth strategies is yet to be fully realised in SSA.

Keywords: Inclusive Growth, Social Inclusion, Economic Inclusion, Institutional Inclusion, Sub-Saharan Africa.

JEL Classification: I31, I38, O43, O55

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1. Introduction

Ongoing discussions in academic circles highlight the potency of inclusive growth as a key strategy for reducing poverty, especially in low-income developing regions, including Sub-Saharan Africa (SSA). The prominent role of inclusive growth in stemming series of challenges that bedevil the SSA region cannot be overemphasised (Yinusa, Aworinde, & Odusanya, 2020; Ogede et al., 2023). The effectiveness of inclusive growth strategies on poverty reduction in Sub-Saharan Africa is a critical area of study due to its profound implications for societal development, economic stability, and human welfare. SSA remains one of the most impoverished regions globally, with persistent challenges such as income inequality, gender disparities, and limited access to essential services despite spurts in economic growth. These issues are exacerbated by factors that include rapid population growth, environmental degradation, and political instability, underscoring the urgency of effective poverty alleviation strategies (Asongu, Nnanna, & Acha-Anyi, 2020). This study focuses on understanding how inclusive growth strategies can mitigate poverty in SSA, emphasising the interplay between economic policies, social inclusivity, and institutional inclusion. The rationale for this focus stems from the severe socio-economic repercussions of poverty on individuals, communities, and national economies. Poverty not only hampers human potential and well-being but also undermines economic growth and stability, perpetuating cycles of deprivation and social exclusion (Asongu, Nnanna, & Acha-Anyi, 2020). This array of challenges could be efficiently addressed through inclusive growth strategies, by focusing on promotion of equitable access to economic opportunities, healthcare, education, and other social services.

The concept of inclusive growth recognises that economic expansion should benefit all segments of the society, particularly marginalised groups such as women, youth, and rural populations. Fostering inclusive economic participation, through the promotion of economic, social, and institutional inclusion, ensures that the proceeds from economic growth benefit the entire citizenry (Makarewicz-Marcinkiewicz, 2013). Economic inclusion plays a crucial role in fostering growth that benefits the poor, especially in rural areas, via massive investments in agriculture and infrastructure. Given the agrarian nature of many economies in the SSA region, agricultural output growth will not only directly result in poverty decline but its positive effects could permeate the broader economy (Berkhout et al., 2017). The impact of investments in rural roads is particularly significant, as they connect isolated rural communities to essential services, reverse rising trends of poverty and stimulates social inclusion. Social inclusion, which involves social protection systems covering aspects like social security, health, and women's empowerment, is recognised as a potent tool in alleviating poverty. Social protection programmes provide short-term aid and long-term support to vulnerable populations, addressing essential life events and breaking the cycle of poverty (Berkhout et al., 2017). Institutional inclusion focused on removing institutional and

policy barriers is another critical dimension in poverty reduction. Comprehensive pro-grammes addressing various areas where support is needed, especially for the benefit of women, are also crucial in empowering women both within and outside households (Fan & Cho, 2021).

In the region, the realities of poverty are obvious with significant implications for social cohesion, political stability, and economic development. Historically, the region has struggled with inadequate infrastructure, weak institutional frameworks, and fet-tered access to education and healthcare, thereby undermining economic mobility and exacerbating poverty (Meagher, 2015; Umeji, 2020). Despite decades of economic growth and development initiatives, poverty remains pervasive, particularly among vulnerable populations such as women, children, and rural communities. The region's rich natural resources have not translated into equitable prosperity for all (Asongu et al., 2020). The effectiveness of inclusive growth strategies in mitigating these chal-lenges remains uncertain, with marginalised groups, such as youth, women and rural communities, experiencing profound barriers to accessing education, healthcare, and employment opportunities (Ozoemena, 2018; Meagher, 2015; Umeji, 2020). Evidence from SSA countries reveal disparities in income distribution, educational attainment, and healthcare outcomes, underscoring the uneven progress towards achieving inclu-sive growth objectives (Makarewicz-Marcinkiewicz, 2013).

Previous research has explored various dimensions of inclusive growth in SSA, em-phasising the nexus between economic policies, social inclusivity, and sustainable de-velopment. Existing policies aimed at promoting inclusive growth in SSA have yielded mixed results. While some initiatives have succeeded in expanding access to education, healthcare, and financial services, others have been hindered by institutional ineffi-ciency, political instability, and inadequate resource allocation. The effectiveness of these policies varies across countries and regions, reflecting the diverse socio-economic landscapes and development priorities within the SSA region (Asongu et al., 2020). De-spite extensive discourse, gaps persist in understanding how inclusive growth strategies have effectively reduced poverty in Sub-Saharan Africa. Limited studies have specifi-cally examined the interplay between inclusive growth strategy and poverty within the region's diverse contexts (Meagher, 2015; Umeji, 2020). Unlike earlier studies, this study contributes to the growing literature on the inclusive growth-poverty nexus by ascertaining and comparing the effects of core inclusive growth strategies (economic, social and institutional) on poverty level in Sub-Saharan Africa. This study contributes significantly to relevant literature by enhancing the understanding of the intricate rela-tionship of economic, social, and institutional inclusiveness with the poverty level in the region.

Against this background, the paper explicitly aimed to:
  i. investigate the impact of economic inclusion strategy on poverty level,
  ii. determine the effect of social inclusion strategy on poverty level, and
  iii. estimate the effect of institutional inclusion strategy on poverty in SSA.

Our results indicate that both infrastructural investment and political stability have a very high tendency to significantly reduce poverty in the region. This underscores the significant roles played by basic infrastructure and political stability in reducing poverty. On the other hand, the coefficients of both health and educational outcomes are positive in relation to poverty. Although this runs quite contrary to expectation, it vividly reveals that investments and growth in both the health and education sectors seem to be less inclusive and modest achievements in these sectors may not be sufficient for breaking the vicious poverty cycle in SSA. These results provide relevant insights into areas that still require support from international agencies and donors towards effective poverty alleviation in Sub-Saharan African countries.

Other sections in the paper are organised as follows: Section 2 presents the review of previous studies. Section 3 focuses on methodology and Section 4 presents the results and discusses the findings, while Section 5 concludes the paper.

2. Review of Previous Studies

In the literature, numerous studies have linked inclusive growth to poverty reduction. These studies underscore the effectiveness of inclusive growth or its specific dimensions, comprising economic, social and institutional inclusion in reducing poverty, and suggest that, as an economy gets closer to achieving overall inclusive growth, it also moves closer to eradicating poverty. Linking inclusive growth to poverty, Nansadiqa et al (2019) employ a vector error correction model (VECM) to analyse the dynamic relationship among economic growth, unemployment, and poverty reduction in Indonesia. VECM analysis finds empirical evidence supporting the negative impact of economic growth and unemployment on poverty levels in Indonesia over the long term. Equally, Adegboyega (n.d.) studies poverty reduction and inclusive growth in Nigeria using the Johansen Co-integration test and Error Correction Model. The analysis confirms the necessity of economic growth; however, it may not ordinarily result into poverty reduction and inclusive development without deliberate policies addressing unemployment, household consumption, agricultural productivity, and rural-urban disparities. Lee and Sissons (2016) explore the link between economic growth and poverty across British cities. The study found limited evidence supporting the notion that economic growth effectively reduced poverty. Similarly, Yadav (2023) studies inclusive growth and poverty reduction in India. The study highlights that inclusive growth indicators, such as poverty reduction, income distribution, and employment equality, have not progressed as expected despite India's significant economic growth. Osamwonyi and Osamwonyi (2015) investigate the inclusiveness of growth in Nigeria and find that the country has not achieved inclusive growth despite impressive economic growth rates over the years. Rather, the economy is still characterised by widespread poverty, high unemployment rates, and significant income and wealth inequality. Key factors contributing to this non-

inclusive growth include underperformance in the manufacturing sector, inadequate human capital development, and low global competitiveness.

On the effect of specific dimensions of inclusive growth to poverty, Umeji (2020) studies how social exclusion impacts poverty in Nigeria. The study found that social exclusion is a significant contributor to poverty in Nigeria. Despite various government initiatives aimed at promoting social inclusion, a large percentage of the population remains in extreme poverty. A similar finding on the effect of social inclusion was established by Cuesta et al. (2022) concerning the estimation of the population at risk of social exclusion in Kenya based on Sen's capability approach. The study reveals that 36.1% of the population lives in absolute poverty, with higher rates in rural areas (40.1%) as compared to urban areas (29.1%). Specific vulnerable groups, such as religious minorities and persons with disabilities, experience disproportionately higher poverty rates (48.3% and 45.7%, respectively). Overall, 16.6 million people, representing 36.6% of the total population, are at risk of social exclusion, with children constituting the largest group at risk as more than half (9.2 million) are facing exclusion. Similarly, the study by Goswamee et al. (2024) on the impact of social inclusion revealed that gender inequality exacerbates poverty by limiting access of women to economic opportunities, education, and decision-making roles. Poverty, in turn, aggravates gender disparities and contributes to social exclusion, particularly among marginalised groups. Social inclusion was identified as crucial for mitigating these issues, underlining the need for inclusive policies and interventions. Likewise, Toriola et al. (2022) utilise panel data analysis to explore the implications of social inclusion on poverty reduction in six lower-middle-income ECOWAS countries. Empirical findings indicate significant negative influence of per capita GDP on poverty, indicating that higher GDP per capita causes reduction in poverty rates. However, income inequality as well as educational and health outcomes were found to be statistically insignificant in their effects on poverty reduction.

Studies analysing the effect of economic inclusion on poverty are abound. For instance, Meagher (2015) analyses the dynamics of informal economy and its interaction with inclusive market initiatives in Kaduna and Kano in Northern Nigeria. The study reveals that inclusive approaches seem to exacerbate inequalities and exclusion rather than enhance economic opportunities for informal workers. Asongu et al. (2020) employ both the Generalised Method of Moments and the fixed effects regression to assess the role of financial access in the connection between income inequality and gender economic inclusion in SSA. Financial access was found to have a negative net effect on the link between female labour force participation and income inequality, suggesting its weak efficacy in stemming income inequality towards enhanced participation of women in formal economic sectors. Conversely, a positive net effect was observed between financial access and female unemployment, indicating its potential role in reducing gender disparities vis-a-vis unemployment

rates. However, overall, there were net negative effects from financial access on the Gini coefficient and Palma ratio for female employment, highlighting complexities in the interaction of financial access, inequality, and female economic inclusion. Aslam et al. (2020) assess how institutional quality, social inclusion, and digital inclusion impact inclusive growth across different income groups. Utilising a two-step system-GMM estimation technique, the study finds that institutional quality has a direct positive association with inclusive growth in high-income countries but not consistently across the various income groups. Social and digital inclusiveness significantly contribute towards inclusive growth across all income groups, with the exception of social inclusion in middle-income countries.

The review of studies provides evidence that most of them concentrate on the aggregate measure of inclusion or on only one or two dimensions of inclusive growth. There is a limited number of studies incorporating all three dimensions of inclusion in the context of Sub-Saharan Africa. Yet, all dimensions of inclusive growth are crucial for achieving overall goals and targets concerning poverty reduction. This research paper addresses this gap by studying the specific impact of each dimension of inclusion on poverty reduction in SSA and analyses the effects of economic, social, and institutional inclusion on poverty in SSA.

3. Methodology

This study covers 18 SSA countries classified as low-middle-income by World Bank, for a period of twenty-three (23) years (2000 to 2022). Following Zainudin and Nordin (2017), the study used a dynamic panel model, where the lagged dependent variable (Yi_{t-1}) is included as an explanatory variable, indicating correlation with the current value (Arellano & Bover, 1995; Gujarati, 2004, Asiedu, 2013; Anyanwu, 2013). The dynamic panel model is specified as follows:

$$Y_{it} = \beta_1 Y_{it-1} + \beta_2 X_{2it} + \beta_3 X_{3it} + \Sigma_{j=1}^{J} \gamma_j Z_{jit} + \theta_i + u_{it} \qquad (1)$$

θ_i is the country-specific fixed effect, Y_{it-1} is the lagged value of the dependent variable of country i at time t, X_2 is the first independent variable of country i at time t, X_3 is the second independent variable of country i at time t, Z is a vector of control variables and γ_i are a set of slope coefficients of control variables. In the current study, independent variables are the three specific dimensions of inclusive growth and the aggregate measure of inclusive growth. In measuring overall inclusive growth, different indicators exist in relevant literature, such as GDP per capita (see Wei &Ren, 2011; Sun, Liu & Tang, 2018), public educational expenditure (Sun, et al, 2018), public health expenditure (World Economic Forum, 2018), and employment rates (Wu, &Zou, 2019; Sun, Liu & Tang, 2018). In this study, GDP per capita (GDPPC)

is utilised due to its popularity and its capacity to reflect the income distribution and investment capacity of the population (Toriola et al, 2022; Wu & Zhou, 2019).

In measuring the three specific dimensions of inclusive growth, namely: social, economic and institutional (Rauniyar & Kanbur 2009; Fernando 2008), the social inclusion was measured using educational outcome (EDUO) as proxy for secondary school enrolment (Adeniyi et al, 2020; Toriola et al, 2022), health outcome (HOU) as proxy for under-five mortality rates (Yu & Wang, 2012; McKinley, 2010), and income inequality (INEQ) as proxy for Gini coefficient (Anyanwu, 2013; Toriola et al, 2022). Economic inclusion was measured by infrastructural investment (INFRI) as proxy for capital formation (Rauniyar & Kanbur 2009; Ali & Son 2007; Fernando 2008) and agricultural development (AGRID) as proxy for added agricultural value (Rauniyar & Kanbur 2009; Bolt 2004). Institutional inclusion was gauged by gender equality (GEQ) (Adebosin et al, 2018) and political stability (PS) as proxy for political stability and absence of violence (Olarenwaju et al, 2019). To measure poverty levels (POV), the poverty headcount ratio was employed (Sinnathurai, 2013; Toriola et al, 2022).

In order to estimate the effect of economic inclusion on poverty, the functional relationship where economic inclusion, measured by infrastructural investment (INFRI), and agricultural development (AGRID) are expressed as a function of poverty (POV) is given as follows:

$$POV_{it} = \beta_1 POV_{it-1} + \beta_2 INFRI_{2it} + \beta_3 AGRID_{3it} + \theta_i + u_{it} \qquad (2)$$

The effect of social inclusion on poverty is analysed by expressing social inclusion measured by educational outcome (EDUO) and health outcome (HOU) as a function of poverty (POV).

$$POV_{it} = \beta_1 POV_{it-1} + \beta_2 EDOU_{it} + \beta_3 HOU_{3it} + \theta_i + u_{it} \qquad (3)$$

In the same way, the study analyses the effect of institutional inclusion on poverty through expressing institutional inclusion measured by gender equality (GEQ), and political stability (PS) as a function of poverty (POV), with the functional relationship given as:

$$POV_{it} = \beta_1 POV_{it-1} + GEQ_{2it} + \beta_3 PS_{it} + \theta_i + u_{it} \qquad (4)$$

Equally, to account for the effect of the overall measure of inclusive growth on poverty, the functional relationship incorporating the control variable comprising of inflation (INF) and net export (NX), which proxy trade openness as used in Anyanwu (2013), is expressed thus:

$$POV_{it} = \beta_1 POV_{it-1} + \beta_2 IG_{it} + \Sigma_{j=1}^{J} \gamma_j Z_{jit} + \theta_i + u_{it} \qquad\qquad (5)$$

IG is inclusive growth proxied by GDP per capita while control variables $\Sigma_{j=1}^{J} \gamma_j Z_{jit}$ comprise inflation rate (INF) and net export (NX).

In the study, poverty level (POV) was measured using the poverty headcount ratio, infrastructural investment (INFRI) was proxied by Gross fixed capital formation (constant 2015 US$), agricultural development (AGRID) was proxied by agriculture, forestry, and fishing, value added (constant 2015), education outcome (EDOU) was proxied by School enrolment, secondary (% gross), while health outcome (HOU) was proxied by under-5 mortality rates. Furthermore, gender equality (GEQ) was proxied by CPIA gender equality rating (1=low to 6=high), political stability (PS) by was measured by estimates of political stability and absence of violence/terrorism, inclusive growth (IG) was proxied by GDP per capita (current US$), inflation (INF) was proxied by consumer prices (annual %) and net export (NX) was measured using the difference between exports and imports of goods and services (in constant 2015 US$).

Data were sourced from the World Bank's World Development Indicators and World Governance Indicators for a period of twenty-three (23) years (2000 to 2022) on eighteen (18) low-middle-income SSA countries, providing a comprehensive and reliable dataset for the research. The list of the eighteen (18) lower-middle-income (LMI) sub-Saharan African countries were drawn from the list of the twenty-three (23) LMI African countries presented by Jobarteh (2024), based on classification by World Bank 2021/2022 covering all five (5) regions in Africa and the recognised African Union (AU) regional economic communities. The 18 countries are Angola, Benin, Cabo Verde, Cameroon, Comoros, Congo republic, Côte d'Ivoire, Eswatini, Ghana, Kenya, Lesotho, Mauritania, Nigeria, São Tomé and Príncipe, Senegal, Tanzania, Zambia, and Zimbabwe. To conduct this estimation, the study employed the Differenced Generalised Method of Moment (D-GMM) estimation technique of dynamic panel model. The preference for D-GMM over system Generalised Method of Moment (s-GMM) is because it guards against over-identification and instrument proliferation (Asongu, Roux & Biekpe, 2017). Besides, the method allows for a robust analysis of relationships over time (Toriola et al, 2022; Asiedu, 2013; Gujarati, 2004).

4. Results and Discussion

Results cover the preliminary test under which the tests for normality, multicollinearity and unit root are presented and are presented as follows:

Table 1: Descriptive statistics

	POV	INFRI	ADRID	EDUO	HOU	GEQ	PS	GDPPC	INF	NX
Mean	43.080	6.54E+09	8.65E+09	47.525	78.901	3.351	-0.395	1621.455	11.097	-7.57E+09
Median	42.400	3.26E+09	1.73E+09	46.134	75.900	3.500	-0.281	1380.885	5.3183	-4.67E+09
Maximum	69.000	3.15E+10	1.22E+11	90.380	202.900	4.500	1.224	5083.827	557.202	-1.50E+08
Minimum	22.500	70766643	24446952	12.856	12.300	2.500	-2.26	253.380	-16.86	-4.16E+10
Std. Dev.	10.768	7.30E+09	2.12E+10	17.761	35.972	0.494	0.732	986.813	37.169	8.11E+09
Skewness	0.279	1.386941	3.950769	0.533	0.600	0.302	-0.435	1.172	10.738	-1.972
Kurtosis	2.351	4.221499	18.28268	2.980	3.338	2.310	2.808	3.980	138.947	7.273
Jarque-Bera	11.936	123.2512	4822.246	17.351	25.333	12.205	12.450	104.949	307822.	486.100
Probability	0.003	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.000	0.000
Observations	391	322	391	367	391	348	377	390	390	345

Results of descriptive statistics appear in Table 1. From the results, poverty level (POV) has a mean value of 43.080, with values ranging from 22.500 to 69.000 and a standard deviation of 10.768, indicating substantial variability. Skewness of 0.279 and kurtosis of 2.351 suggest a relatively normal distribution, though the Jarque-Bera test statistic (11.936, p = 0.003) indicates some deviation from normality. These high poverty levels, as indicated by the high mean value with significant variability, reflect ongoing challenges in achieving inclusive growth in SSA. Furthermore, infrastructural investment (INFRI) has a mean value of 6.54E+09, with a standard deviation of 7.30E+09, showing high variability and a range from 70766643 to 3.15E+10. Skewness of 1.387 and kurtosis of 4.221 indicate a right-skewed and leptokurtic distribution. The Jarque-Bera test statistic (123.2512, p = 0.000) confirms non-normality, suggesting inconsistent infrastructural development, which is vital for economic growth and poverty alleviation. Agricultural development (AGRID) has a high mean value of 8.65E+09, with extreme variability indicated by a standard deviation of 2.12E+10 and a wide range from 24446952 to 1.22E+11. The skewness of 3.951 and kurtosis of 18.283 suggest a highly right-skewed and leptokurtic distribution. The Jarque-Bera test statistic (4822.246, p = 0.000) shows significant non-normality, reflecting the crucial albeit uneven role of agriculture in SSA economies.

Education outcomes (EDUO) show a mean value of 47.525, ranging from 12.856 to 90.380, with a standard deviation of 17.761, indicating significant variability. Skewness of 0.533 and kurtosis of 2.980 suggest a slightly right-skewed and near-normal kurtosis. The Jarque-Bera test statistic (17.351, p = 0.000) confirms non-normality, highlighting uneven educational access and quality, both critical for inclusive growth and long-term poverty reduction. Equally, the Health outcomes (HOU) have a mean value of 78.901, with significant variability, as indicated by a standard deviation of 35.972 and a range from 12.300 to 202.900. The skewness of 0.600 and kurtosis of 3.338 reflect a distribution with some right-skewed and leptokurtosis. The

Jarque-Bera test statistic (25.333, p = 0.000) shows non-normality, indicating disparities in health services and outcomes across SSA.

Inclusive growth measured by the GDP per capita (GDPPC) has a mean value of 1621.455, with values ranging from 253.380 to 5083.827, suggesting significant disparities in economic well-being across SSA. The standard deviation of 1380.885 indicates high variability. The positive skewness of 1.172 and kurtosis of 3.980 show a distribution with occasionally high values. The Jarque-Bera test statistic (104.949, p = 0.000) confirms non-normality, reflecting uneven economic growth that may not uniformly benefit all population segments, thus hindering inclusive growth. Political stability (PS) has a mean value of -0.395, indicating general instability. The range from -2.26 to 0.732 and a standard deviation of 1.224 show considerable variability. Skewness of -0.435 suggests a slight left-skewed, while kurtosis of 2.808 indicates a more platykurtic distribution, indicating less frequent extreme events. The Jarque-Bera test statistic (12.450, p = 0.002) suggests non-normality, highlighting political instability as a barrier to economic growth and poverty reduction. Gender equality (GEQ) has a mean value of 3.351, with a range from 2.500 to 4.500 and a low standard deviation of 0.494, indicating lower variability. The skewness of 0.302 and kurtosis of 2.310 suggest a relatively normal distribution. However, the Jarque-Bera test statistic (12.205, p = 0.002) indicates some deviation from normality, pointing to systemic gender disparities that could impede inclusive growth and poverty alleviation.

Inflation has a mean value of 11.097, which is high and indicative of persistent inflationary pressures. The minimum value of -16.86 and maximum of 37.169 demonstrate considerable fluctuation, reflected in the high standard deviation of 10.738. With skewness of 10.738 and kurtosis of 138.947, the distribution is highly right-skewed and leptokurtic, indicating sporadic but extreme inflationary spikes. The Jarque-Bera test statistic (307822.6, p = 0.000) shows significant departure from normality, which can destabilise economies, erode purchasing power, and exacerbate poverty. Net exports (NX) with a mean value of -7.57E+09 suggests a substantial trade deficit, reflecting more imports than exports. The NX range from -4.16E+10 to 8.11E+09 indicates significant variability, highlighting economic instability. The high standard deviation of 1.97E+10 underscores this volatility. Skewness of -1.972 indicates that extreme negative values are more common. A kurtosis of 7.273 indicates a leptokurtic distribution, with frequent extreme deviations from the mean value. The Jarque-Bera test statistic (486.100, p = 0.000) confirms non-normality, implying that trade policies and external economic shocks may have unpredictable impacts on SSA economies.

Descriptive statistics reveal substantial variability and non-normality across key economic indicators in SSA. As implied by the statistical distribution of the variables, high levels of inflation, trade deficits, and variability in GDP per capita, political sta-

bility, health, and education outcomes, underscore possible challenges when it comes to achieving inclusive growth.

Table 2: Pairwise Correlation Matrix

	POV	INFRI	ADRID	EDUO	HOU	GEQ	PS	GDPPC	INF	NX
POV	1.000									
INFRI	-0.473	1.000								
ADRID	-0.390	0.726	1.000							
EDUO	0.061	-0.023	0.181	1.000						
HOU	0.132	-0.052	-0.217	-0.540	1.000					
GEQ	-0.062	-0.002	0.031	0.173	-0.244	1.000				
PS	-0.032	-0.060	-0.222	0.054	-0.107	0.442	1.000			
GDPPC	-0.147	0.478	0.059	0.142	-0.214	-0.112	-0.021	1.000		
INF	-0.096	0.061	-0.019	-0.075	0.155	0.102	-0.197	-0.046	1.000	
NX	0.407	-0.865	-0.557	0.016	-0.118	0.008	0.158	-0.596	-0.1360	1.000

Key: POV: poverty level, INFRI: infrastructural investment, AGRID: agricultural development, EDUO: education outcome, HOU: health outcome, GEQ: gender equality, PS: political stability, GDPPC: inclusive growth, INF: inflation, NX: net export proxy
Source: Author, 2024

The pairwise correlation coefficients, as presented in Table 2, show the correlation between infrastructural investment and poverty level. This suggests that higher infrastructural investment is associated with lower poverty levels, reflecting the critical role of infrastructure in enhancing economic opportunities and reducing poverty. Agricultural development also shows a negative correlation with poverty level. This negative relationship highlights the importance of agricultural development in poverty reduction, since improved agricultural practices and output can enhance food security and income for the rural poor.

Educational outcomes have a very weak positive correlation with poverty, suggesting that higher educational outcomes have not significantly impacted lower poverty levels in this dataset, which could indicate issues with the quality of education or the translation of educational attainment into economic opportunities. Health outcomes show a weak positive correlation with poverty level. This runs quite contrary to expectation. This counterintuitive result reflects the complexity of health indicators or the fact that poverty-stricken areas might still have targeted health interventions that improve health outcomes with no immediate reduction in poverty.

The association, albeit tenuous, between GDP-per-capita and poverty indicates that higher inclusive growth tends to lower poverty levels, thereby reflecting the notion that inclusive growth can contribute towards poverty reduction. Gender equality and poverty level have a very weak negative correlation, indicating a slight tendency for better gender equality to be associated with lower poverty levels. This weak relationship suggests that, while gender equality is important, other factors might play a more significant role in poverty alleviation in SSA. Political stability has an extremely weak negative correlation with poverty level, suggesting a negligible relationship. This indicates that political stability, while crucial for overall development, may not directly correlate with poverty levels. Net exports have a moderately positive correlation with poverty, indicating that higher net exports are associated with higher poverty levels. This probably implies that the benefits of export activities are not widely distributed among the population or that export-driven growth has not been inclusive. Correlation analysis generally reveals interrelationships among key socio-economic variables affecting inclusive growth and poverty in SSA.

Table 3: Levin, Lin & Shu Unit Root Test Results

	LEVEL		FIRST DIFFERENCE	
	W-Stat	**PROB**	**W-Stat**	**PROB**
POV	2.46404	0.9931	-11.2962	0.0000
INFRI	6.51151	1.0000	-10.8442	0.0000
ADRID	- 7796.32	0.0000	- 19195.1	0.0000
EDUO	2.78120	0.9973	-10.3194	0.0000
HUO	-32.1821	0.0000	0.67109	0.7489
GEO	1.43127	0.9238	-10.0334	0.0000
PS	-4.17425	0.0000	-17.1870	0.0000
GDPPC	1.31536	0.9058	-124308	0.0000
INF	-10.3428	0.0000	-22.1797	0.0000
NX	5.60332	1.0000	-9.63472	0.0000

Key: POV: poverty level, INFRI: infrastructural investment, AGRID: agricultural development, EDUO: education outcome, HOU: health outcome, GEQ: gender equality, PS: political stability, GDPPC: inclusive growth, INF: inflation, NX: net export
Source: Author, 2024

Unit root test results indicate that poverty level, infrastructure investments, educational outcomes, gender equality, economic growth and net exports are non-stationary at levels but become stationary at first differences. However, inflation, health outcome and political stability, as well as agricultural development were stationary at levels. This necessitates careful consideration in econometric modelling and policy formulation when addressing these underlying trends.

Table 4: Cross-Sectional Dependence Test

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	332.961	378	0.4130
Pesaran scaled LM	-0.3643		0.6903
Pesaran CD	-0.0420		0.9639

Source: Author, 2024

In the results illustrated in Table 4, the associated probabilities of the statistics across the three tests, comprising Breush-Pagan LM test, Pesaran Scaled LM test and Pesaran CD test, which are 332.961, -.3643, and -0.0420, respectively, are above the 0.05 critical level. This implies that the null hypothesis cannot be rejected for the three tests indicating uncorrelated residuals across cross-sectional units, which supports the use of standard panel data estimators without additional corrections for cross-sectional dependence.

Table 5: D-GMM Estimates

		POV(-1)	LOG (INFRI)	LOG (ADRID)	Time	Obs	Instrument	J-stats	AR(1)	AR(2)	Jarque Bera	F-stat
Economic Inclusion Effect		0.022 (0.000) [8.637]	-0.055 (0.00) [-13.570]	0.091 (0.000) [32.085]	21	294	14	13.456 (0.265)	-2.092 (0.036)	0.954 (0.340)	1.349 (0.491)	1955.786 (0.000)
Social Inclusion Effect		POV(-1)	LOG (EDUO)	LOG (HOU)								
		0.020466 (0.000) [90.830]	0.011 (0.000) [39.637]	0.024 (0.000) [184.894]	21	335	16	13.772 (0.390)	-1.612 (0.107)	1.015 (0.310)	2.155 (0.510)	6893.221 (0.000)
Institutional Inclusion Effect		POV(-1)	GEQ	PS								
		0.022 (0.000) [42.290]	0.034 (0.000) [6.217]	-0.011 (0.000) [-23.504]	21	310	16	13.152 (0.436)	-2.147 (0.032)	1.089 (0.276)	1.311 (0.110)	1034.371 (0.000)
Aggregate Effect	PPOV (-1)	LOG (GDP PC)	INF	NX								
	0.756 (0.000) [16.617]	-1.084 (0.000) [-5.063]	0.0030 (0.017) [2.410]	7.37E-11 (0.527) [0.632]	21	314	15	14.402 (0.276)	-0.554 (0.600)	0.430 (0.687)	1.622 (0.022	131.920 (0.000)

Key: POV: poverty level, INFRI: infrastructural investment, AGRID: agricultural development, EDUO: education outcome, HOU: health outcome, GEQ: gender equality, PS: political stability, GDPPC: inclusive growth, INF: inflation, NX: net export

Note: Values in parenthesis ( ) and brackets [ ] are p-values and t-statistics, respectively

Source: Author, 2024

According to Table 5, the coefficient of agricultural development is 0.091. This positive and highly significant relationship suggests that increased agricultural activities are not translated into poverty level reduction. This result indicates that agricultural development benefits are not equitably distributed across the population. This could be due to issues such as lack of access to modern farming technologies, or unequal distribution of agricultural investments. The coefficient of infrastructural investment is negative. This negative and highly significant relationship indicates that increased infrastructural investment could bring about reduction in poverty levels. The probability value of the AR (1) statistic indicates some first-order serial correlation in the residuals, while the p-value of the AR (2) statistic reveals absence of second-order serial correlation. The Hansen J-statistic suggests that the instruments used in the model are valid, supporting the credibility of the instrumental variable approach when it comes to mitigating endogeneity concerns.

The coefficient of health outcomes is positive and highly significant, implying that improvements in health outcomes are not effective in lowering poverty levels. Ordinarily, this runs contrary to expectation since better population health outcomes should reduce poverty. However, many households still lack unfettered access to quality health care, especially in rural areas which harbour most of the inhabitants of the region. In the same vein, the region consistently records very poor health outcomes in terms of high mortality rates and low life expectancy, while the level of investment and resource management in health care still remain abysmally poor to yield noticeable and desirable improvements in health outcomes in the region (Kalu et al, 2025). In fact, Musah et al. (2025) indicate that rising out-of-pocket expenditure is associated with worsening health outcomes in SSA. The coefficient of educational outcomes is positive and highly significant. This is similar to the health outcome results. It suggests that mere enrolments in schools is not significant in lowering poverty levels. Normally, education should empower individuals with knowledge and skills necessary for economic participation since it enhances job prospects and reduces income inequality. It is apt to note that investments in education are still too low to stimulate growth and development to the level required for substantially reducing poverty while the majority of citizenry are still lacking access to qualitative education. The region has a very high number of out-of-school children, with nearly 90 percent of them failing to acquire basic reading and comprehension skills before reaching age 10 (Barrigah, 2023), while dropout rates are soaring. These facts indicate the tenuous effect of educational outcomes on poverty. As contended by Sikiku (2024), for education to really impact the vicious cycle of poverty in the SSA, governments need to improve budgetary allocations to education and ensure more judicious utilisation of available funds. The p-value of the AR (1) statistic indicates first-order serial correlation in the residuals. The AR (2) statistic indicates no problem of second-order serial correlation. The Hansen J-statistic with a p-value of 0.000 confirms the validity of the instruments used in the model.

The coefficient of political stability is negative and highly significant. This shows that improved political stability is associated with lower poverty levels. The AR (1) statistic indicates first-order serial correlation in the residuals, while the AR (2) statistic confirms absence of second-order serial correlation. Based on the p-value of J-statistic, the instruments used in the model are valid. The coefficient of inclusive growth is negative and highly significant, indicating that higher inclusive growth is associated with lower poverty levels in SSA. The model suffers no potential problem of second-order serial correlation based on the p-value of the AR (2). Likewise, the J-statistic suggests that the instruments used in the model are valid.

The result of the analysis showed that the economic inclusion components of any inclusive growth tested, comprising agricultural development and infrastructural investment, play a crucial role in shaping poverty levels in SSA. While agricultural development shows a positive, albeit counterintuitive, relationship with poverty indicating challenges in equitable distribution of benefits, infrastructural investment demonstrates a clear negative relationship with poverty, highlighting its role in promoting inclusive growth. This finding is in line with Meagher (2015) on the dynamics of informal economy and its interaction with inclusive market initiatives. The study reveals that, while economic opportunities for informal workers are enhanced by inclusive approaches, these often exacerbate inequalities and exclusion within the informal sector. This is also in line with Asongu et al. (2020) on the moderating role financial access plays in the relationship between income inequality and gender economic inclusion. Financial access was found to have a negative net effect on the relationship between the Palma ratio and female labour force participation, suggesting limited effectiveness in moderating income inequality when it comes to enhancing women's participation in formal economic sectors.

Furthermore, results show that the social inclusion dimensions tested in the study, comprising health and education outcomes, significantly influence poverty levels in SSA. Improved health outcomes and expanded access to education contribute positively to poverty reduction by enhancing human capital, increasing productivity, and improving overall quality of life. These findings corroborate those of Goswamee et al. (2024). The result is at variance with Toriola et al. (2022) concerning implications of social inclusion on poverty reduction in ECOWAS. Empirical findings suggest that income inequality, educational outcomes, and health outcomes have no significant effect on poverty. This result is also supported by Aslam et al. (2020) on the impact of institutional quality, social inclusion, and digital inclusion on inclusive growth across different income groups. The study reveals that social and digital inclusivity significantly contributes to inclusive growth across all income groups, except for social inclusion in middle-income countries.

Furthermore, analysis shows that the institutional inclusion dimensions covering political stability and gender equality significantly influence poverty levels in SSA. Improved political stability enhances governance effectiveness and investor

confidence, contributing to economic growth and poverty reduction. Similarly, promoting gender equality empowers women, reduces inequalities, and enhances social cohesion, thereby fostering inclusive growth. This result agrees with evidence on the effect of institutional inclusion on poverty provided by Aslam et al. (2020) on the impact of institutional quality, social inclusion, and digital inclusion on inclusive growth.

The result of the effect of overall measure of inclusive using GDP per capita shows that inclusive growth and inflation significantly influence poverty levels in SSA. Higher inflation rates are associated with increased poverty, highlighting the importance of effective inflation management for poverty reduction. Additionally, higher inclusive growth is linked to lower poverty levels, underscoring the role of economic growth in improving living standard and reducing poverty. The finding is also congruous with Nansadiqa et al. (2019) on the dynamic relationship between economic growth, unemployment, and poverty reduction in Indonesia. It is also in line with the study of Yadav (2023) on inclusive growth and poverty reduction in India. The study highlights that despite India's significant economic growth, inclusive growth indicators such as poverty reduction, income distribution, and employment equality have not progressed as expected. It is congruent with Osamwonyi and Osamwonyi (2015) on phenomenon of inclusive growth in Nigeria where it was submitted that despite impressive economic growth rates in Nigeria over the years, the country has not achieved inclusive growth. The result also agree with Toriola et al (2022) on the implications of social inclusion on poverty reduction.

5. Conclusion

This study examined how inclusive growth strategies exert on poverty reduction in Sub-Saharan Africa. The study specifically analysed the effect of economic, social, and institutional inclusiveness on poverty level from 2000 to 2022. It is inferred that the effect of infrastructural investment on poverty is negative while agricultural development exerts a positive effect on poverty. The result also showed that health outcomes and education exert a positive effect on poverty. Political stability shows a negative effect while the effect of gender equality on poverty is positive. The aggregate measure of inclusive growth shows a negative effect implying that higher inclusive growth is linked to lower poverty levels. This result implies that the aggregate inclusive growth strategy positively contributes to poverty reduction but the effect of individual components of the three specific strategies of inclusive growth is not uniform. The study demonstrated the capability of inclusive growth in addressing poverty but the potential of the specific inclusive growth strategies in addressing poverty is yet to be fully realised in SSA.

The study therefore recommends the need for policies that prioritise enhanced agricultural productivity and equitable access to agricultural resources and technolo-

gies. At the same time, investments in infrastructure are vital for reducing regional disparities and fostering economic opportunities. There is also the need to prioritise investments in healthcare infrastructure, ensuring universal access to quality healthcare services, and enhancing educational opportunities for all segments of the population. Furthermore, policies aimed at enhancing institutional inclusion should focus on strengthening governance frameworks, safeguarding political stability, promoting gender equality, and addressing inefficiencies.

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TOURISM DEVELOPMENT IN THE BALKANS IN THE LIGHT OF CROSS-BORDER CO-FINANCED PROGRAMMES

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Abstract

This paper aims to highlight the contribution of cross-border programmes to tourism development in the Balkans, through an analysis of the preparation, planning, approval, and implementation processes of these programmes—particularly through the study of indicators used to monitor the implementation of related actions.

Venturing to gain a general overview of the implementation of co-financed programmes, the article analyses the political significance and necessity of cross-border cooperation, as well as the mutual influence between tourism and such cooperation. The analysis of indicators per programme and per partnership scheme is crucial for forming a comprehensive picture of European Union's funding in tourism-related matters in Balkan countries.

Additionally, the comparative study of indicators by programme and partnership scheme contributes towards drawing more accurate conclusions. The paper concludes with presenting several proposals to improve monitoring and evaluating actions within cross-border programmes.

Keywords: Cross-border cooperation, European Territorial Cooperation, European Funding Programmes, Indicators, INTERREG, Instrument Pre-Accession Assistance

JEL Classification: R10, R11

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1. Introduction

Interest in and study of borders, and in particular cross-border cooperation, have only recently begun to develop. Globalisation and the enlargement of the European Union (EU), resulting from political and social upheavals, have contributed towards highlighting the importance of developing inter-state relations (A. James, L. O'Dowd, and T. M. Wilson, 2004).

European Territorial Cooperation is one of the main objectives of EU cohesion policy, which was designed to address issues that go beyond the narrow geographic boundaries of member states. The policy also aimed to highlight, through coordinated actions, the potential and opportunities of the regions involved. European Territorial Cooperation is divided into three main forms: a) cross-border cooperation, which takes place between administrative regions of two neighbouring countries; b) transnational cooperation, which takes place between two or more neighbouring countries with the entire territory eligible; and c) interregional cooperation, aimed at creating pan-European cooperation networks including countries that may not share borders but are facing common challenges and exchange experience & knowledge they have acquired.

Tourism, as a key sector that can contribute to regional development, is a priority for the EU. For this reason, it has been observed that in many Territorial Cooperation Programmes, Tourism constitutes a Thematic Objective, a Priority Axis, or, at least, an Investment Priority. Regardless of the form in which the theme appears, it is certainly an issue the European Union invests in, the objective being to develop and expand cooperation between regions/states, to ultimately achieve smooth relations.

Tourism can be a development driver. At the same time, it contributes to the development of cross-border cooperation between two countries/regions and is also influenced by it. However, for tourism to develop comprehensively, certain factors must be secured to enable a region to achieve the tourism growth desired.

In this context, the purpose of this paper is to highlight how cross-border Programmes contribute to the development of tourism between two or more regions located on the borders of two neighbouring countries in the Balkans. Research is developed both horizontally and vertically. On the one hand, it examines how co-funded Programmes are implemented; on the other hand, research focuses on how this implementation differs in various pairs of regions/countries. More specifically, the study aimed not only to investigate and evaluate the implementation of Programmes funding tourism-related projects, but also to analyse whether and how implementation varies according to the nature of the partnership (i.e., between two EU member states, between an EU member state and a candidate country, and between two candidate countries). Equally important is the research on how regions/countries benefit from cross-border Programmes and the Cohesion Policy, but also on how such benefit differs depending on the level at which the participating countries stand.

With respect to the methodology, analysis is based on a qualitative approach, utilising secondary data, such as annual reports, EU regulatory documents, and material already published on Programme websites. To investigate effectiveness, output and outcome indicators were recorded and compared.

A qualitative methodology was applied through the analysis of secondary data (reports, Programme documents, regulations). Additionally, a comparative quantitative approach was applied based on indicators from Annual Implementation Reports.

Given that the archival material studied for the purposes of this paper, and in particular the Annual Implementation Reports, results from processing and analysing respective Programmes implemented during the 2014–2020 programming period, the accuracy of the information contained therein is not guaranteed, since these are data already processed by project beneficiaries and the Programme monitoring and evaluation Authorities. As a result, some of the data analysed may not be accurate or valid.

2. Political Significance and Necessity of Cross-Border Cooperation

Cross-border cooperation has been a fundamental aspect of the European Union (EU) since its inception and has both influenced and been shaped by political decisions over time. The EU has been consistently making political choices to strengthen ties among member states and, in time, with non-member countries, as well.

The Treaty of Rome (1957)[1] marked the beginning of harmonised political and economic relations, aiming to reduce disparities between member states. It established common policies in agriculture, trade, and transport and introduced shared institutional frameworks.

Despite its importance, the expansion of cross-border cooperation was not always uniformly welcomed. For example, Greece threatened to veto the entry of Spain and Portugal into the EU unless measures were taken to protect agricultural production (Brunazzo, 2016). As a response, "Mediterranean Programmes" were launched, shifting decision-making power to regional authorities rather than central governments (Schakel, 2020).

Over time, regions gained more political influence and autonomy, participating in funding decisions and policy making. Citizens also began to engage more actively through public consultations. This democratisation of EU processes was especially impactful for countries with traditionally centralised systems (Getimis and Demetropoulou, 2007).

Historical events, such as the dissolution of the Soviet Union and the Yugoslav Wars led to the development of cross-border programmes aimed at supporting vulner-

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1. **Treaty of Rome (EEC)**: European Economic Community. (1957). Treaty establishing the European Economic Community. Found at https://eur-lex.europa.eu/legal-content/EL/TXT/?uri=LEGISSUM%3Axy0023

able and less-developed areas near EU borders. However, wealthier member states often resisted funding these efforts, leading to public scepticism—exemplified by the UK's decision to leave the EU (Gross και Debus, 2018).

Research indicates that EU regional policy can influence national politics and electoral outcomes (Gross and Debus, 2018). Regions receiving more EU funding with minimal national co-financing tend to favour pro-EU parties. Thus, cross-border cooperation is not just a technical or economic matter — it is deeply political, especially for politically active or less-developed regions.

In conclusion, political dynamics both drive and are shaped by cross-border cooperation. The way EU Cohesion Policy is implemented nationally and how member states react to cross-border initiatives reflect the broader political agenda of both the EU and individual countries. These dynamics are crucial for shaping the future of EU policy.

3. How Tourism Affects Cross-Border Cooperation – What Is Its Importance for Tourism?

Tourism plays a crucial role in cross-border cooperation, which is a key aspect of the EU Cohesion Policy aimed at fostering development among neighbouring countries. Border regions often share geographical, historical, and cultural similarities, but are governed separately, leading to different approaches to the same issues (Kropinova, 2021). Coordinated tourism development in these areas can promote mutual benefits and regional growth.

In cases where there are significant differences between neighbouring border areas, cross-border programmes can still foster cooperation and economic development through tourism (Hardi et al., 2021). Proper funding and joint promotion can enhance the visibility of local attractions, making the region more appealing to visitors (Gashi et al., 2020).

Some border areas are historically or culturally unified but have been divided by political boundaries. Cross-border tourism initiatives can reconnect people with their heritage and encourage reconciliation between nations (Kropinova, 2021). Conversely, cultural diversity across borders can also serve as a tourism attraction, provided there is cooperation to improve access and infrastructure (Gashi et al., 2020).

Border regions are often depopulated, with young people moving away in search of better opportunities. Tourism, supported by cross-border funding programmes, can offer economic prospects for youth, and contribute towards revitalising these areas (Badulescu et al., 2014).

However, administrative differences and governance challenges between countries can hinder cooperation[2]. It is, therefore, essential for both public and private

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2. **European Commission: Directorate-General for Regional and Urban Policy**, Analysis of cross-border obstacles between EU Member States and enlargement countries – Final report, Publications Office of the European Union, 2021, https://data.europa.eu/doi/10.2776/164787

sector actors at local and national levels to collaborate effectively. Overcoming bu-reaucratic obstacles and engaging multiple stakeholders is vital to the successful de-velopment of tourism in cross-border areas (Badulescu et al., 2014).

Furthermore, border areas deserve more attention, since metropolitan areas are usually already developed. Tourism can act as a catalyst for broader economic devel-opment, especially when infrastructure and services – such as transport, healthcare, accommodation, and catering – are enhanced through co-funded projects. These ini-tiatives contribute to sustainable tourism and long-term regional growth (Badulescu et al., 2014).

In conclusion, tourism and cross-border cooperation are enhance each other. In-vestment in border regions improves tourism potential, while tourism projects can foster deeper cooperation between countries. Success, however, depends on the ac-tive collaboration of local authorities, public institutions, and private stakeholders.

4. Analysis of the Process of Programming, Monitoring and Evaluating

Thorough examination of how these Programmes are designed and implemented it becomes apparent that there are many challenges that must be addressed to ensure better management and successful execution of such programmes. As evidenced by Programming documents and EU Regulations, the authorities responsible for Pro-grammes differ from country to country. Governance structures vary among states, resulting in inequalities between countries that collaborate in a partnership or a Pro-gramme. Some countries are already developed, with well-structured organisations and extensive experience in project management & implementation, while others are still in a phase of development, receiving recommendations from the EU and gradu-ally organising their administrative and management systems.

Specifically, Western Balkans countries were forced to reorganise their govern-ance systems after the economic and political crisis of the 1980s and, most certainly, after the dissolution of Yugoslavia in the 1990s[3].

However, important elements such as culture, language, and work ethic can-not be ignored since they influence the structure of a country's organisations and, consequently, the relationships and cooperation between two countries, as well as the sustainability of actions implemented[4]. These factors impact both Programme-level management and project-level implementation by beneficiaries. Cooperation

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3. **European Court of Auditors**, Special Report 01/2022: EU support for the rule of law in the Western Balkans: despite efforts, fundamental problems persist. Luxembourg: European Court of Auditors, 2022. doi:10.2865/834534. p.9 found at: https://www.eca.europa.eu/el/publica-tions/SR22_01

4. **European Commission**: Directorate-General for Regional and Urban Policy, Analysis of cross-border obstacles between EU Member States and enlargement countries – Final re-port, Publications Office of the European Union, 2021, p.10 found at https://data.europa.eu/doi/10.2776/164787

between different countries and partners does not follow a clear or smooth path and needs to address several issues beyond the usual difficulties involved in project implementation.

Starting with the initial Programme design documents, and more specifically the Partnership Agreement[5] or the Strategy Document, it becomes evident that Territorial Cooperation Programmes (INTERREG, IPA CROSS-BORDER) are only a very brief section within the overall strategic planning of each state for its programming period. These programmes usually occupy one or two paragraphs, without a detailed analysis, indicating the level of importance attributed to them by each country.

In this context, the absence of a clear and specialised analysis concerning cross-border Programmes may lead to double funding of identical projects through Sectoral Operational Programmes, which means not only losing the added value of projects but also further developing corruption. It would, therefore, be advisable to have cross-border cooperation strategies with specialised themes, specifically tailored to the regions involved.

On the other hand, it is clear, and widely accepted, that addressing many problems in cross-border regions – for example, construction projects, railway or road infrastructure – requires significant funding, which is not allocated to such Programmes. Consequently, it is understood that cross-border cooperation Programmes are not being treated with the seriousness and significance they deserve[6], and are not given the necessary resources to address the prevailing issues in eligible areas.

Likewise, analysing the programming documents – particularly the section concerning regional needs – makes it evident that the ex-ante evaluation is conducted on a national basis, as each country is required to submit its own needs and evaluation (Regulation [EU] No 1303/2013, CHAPTER II, Article 15). However, given the cross-border cooperation between two countries, a joint evaluation using an identical methodology (e.g., questionnaires, interviews, etc.) on both sides of the border would provide a clearer picture of the cross-border nature of regional needs and potentially offer more benefits regarding regional weaknesses.

Additionally, from the Interim Evaluation of the nine IPA CBC cross-border Programmes, conducted by the EU, for the 2014- 2019 period[7], it is evident that many

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5. **Ministry of Development and Investments** (2014). *Partnership Agreement 2014–2020.* Found at https://2014-2020.espa.gr/elibrary/PA_ESPA_2014_2020.pdf

6. **European Court of Auditors**. (2021). *Special Report 14/2021: Interreg cooperation: The potential of the European Union's cross-border regions has not yet been fully unlocked.* p.27, Found at https://www.eca.europa.eu/Lists/ECADocuments/SR21_14/SR_cross-border_EL.pdf

7. **European Commission**. (2021). *Mid-term evaluation of cross border cooperation programmes between IPA II beneficiaries. Directorate-General for Neighbourhood and Enlargement Negotiations. p.29. Found at* https://neighbourhood-enlargement.ec.europa.eu/system/files/2021-09/IPA%20CBC%20mid-term%20evaluation%20final.pdf

beneficiaries faced considerable difficulties in preparing and submitting funding proposals. According to this evaluation report, many beneficiaries in these countries require additional support and guidance. There are still deficiencies in the capacity and skills of partnership structures, which, in turn, cast doubt on the management and implementation of projects and the data submitted to Programme Authorities (MA/JTS). Thus, the choice of indicators and the method of their measurement may not be appropriate, and the data submitted by beneficiaries may not reflect the actual state of project implementation.

Similarly, as mentioned in the interim report on cross-border cooperation Programmes between EU candidate countries[8] (2021), the fact that staff from the JTS or the National Authority were not involved in the evaluation process – but only external evaluators who were not from the eligible area – highlights how local factors may have been overlooked. Another issue proving the lack of capacity in cross-border regions is that most NGO partners do not come from the area of interest but from other regions. Consequently, the proposals and projects submitted and approved are not strong initiatives from stakeholders who know and experience the region's problems and aim to address them. Many proposals may thus be questioned regarding their cross-border nature and relevance to a Programme's purpose. According to the European Court of Auditors[9], due to lack of sufficient information and training, lack of experience, or non-local origin (and thus poor knowledge of local issues), cooperation in the proposals submitted for funding was often limited to the act of submitting a joint proposal, without entailing any real cross-border character.

Another critical issue is that of Project Evaluation. According to a report by the European Court of Auditors[10], there are no clear guidelines in EU regulations regarding the Evaluation System for projects seeking funding. Specifically, it has been noted that one country may evaluate proposals using qualitative criteria, which are more subjective, while others use a scoring system, which simplifies the work of the Monitoring Committee that makes the final decision and ensures a more transparent process. Therefore, in some cases, due to the lack of clear instructions and uniform

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8. **European Commission.** (2021). *Mid-term evaluation of cross border cooperation programmes between IPA II beneficiaries. Directorate-General for Neighbourhood and Enlargement Negotiations. p.39. Found at* https://neighbourhood-enlargement.ec.europa.eu/system/files/2021-09/IPA%20CBC%20mid-term%20evaluation%20final.pdf

9. **European Commission.** (2021). *Mid-term evaluation of cross border cooperation programmes between IPA II beneficiaries.* Directorate-General for Neighbourhood and Enlargement Negotiations. p.54. Found at https://neighbourhood-enlargement.ec.europa.eu/system/files/2021-09/IPA%20CBC%20mid-term%20evaluation%20final.pdf

10. **European Court of Auditors**. (2021). *Special Report 14/2021: Interreg cooperation: The potential of the European Union's cross-border regions has not yet been fully unlocked*, p.39, found at https://www.eca.europa.eu/en/publications?did=58917

specifications across all participating countries, the responsible authorities may not select the best proposals for implementation, which casts doubt on their results.

From all the above, it becomes evident that, while there are specific Thematic Objectives for Cross-border Cooperation Programmes – some of which the beneficiaries are obliged to choose – there is also excessive freedom in the final selection of the actions to be implemented. Based on a single Thematic Objective, partners can create a mountain tourism trail or restore a monument. This results in a less visible financial impact of the funding provided. The implementation of numerous small and varied actions – considering the modest budgets of these Programmes – weakens the focus that could be achieved by targeting a smaller number of initiatives to support tourism development.

By funding a specific category of actions (e.g., hiking trails or monument restoration), the Programme's contribution could be more visible, and addressing certain needs of the eligible area could become more effective. Current flexibility in funding a variety of actions dilutes the financial support into small interventions that are unlikely to meet all needs or significantly address an area's weaknesses.

Another factor, worth noting in terms of planning, is the limitations of statistical data in some countries – for example, in IPA II "Serbia – Bosnia and Herzegovina, 2014–2020" the lack of a clear and complete picture of the cross-border area's needs, weaknesses, and opportunities initially affected the ex-ante evaluation and, subsequently, the target setting and the definition of appropriate indicators and actions for beneficiaries. This is something that should be seriously considered by the EC and the EU when monitoring and evaluating the information included in the Annual Reports of respective Programmes.

At the same time, analysis of programming documents reveals that not only is there wide freedom in selecting actions – as mentioned above – but also in selecting target groups for projects to be funded. This practice weakens the focus of Programmes. On the one hand, funding is limited, and on the other, the Programme does not seem to concentrate on a limited number of target groups, which would allow for greater impact and achieving better results.

Furthermore, when analysing regulations concerning cross-border cooperation, it has been noted that, although the primary purpose of these Programmes is cooperation between at least two countries, there are exceptions – when the impacts and benefits of a project are significant – where a single-country entity may receive funding. While such actions are subject to evaluation by the EC/Monitoring Committee, the exceptions are not clearly defined, nor is there a strict framework for their assessment. Given the existence of Sectoral Operational Programmes for funding, perhaps this provision should not be included in cross-border Programme regulations.

In conclusion, it should be noted that additional safeguards and tools are necessary to address these risks – such as absence of evaluators from the eligible area, lack

of common management mechanisms, and local residents' involvement in identifying regional needs. This way, projects approved for funding will not be subject to doubt, and their results will be accurate and reflective of the actual situation.

5. Indicators

One of the main obligations of cross-border Programmes is the submission of an ex-ante evaluation. This is an important stage both for the approval and the implementation of Programmes, since it allows countries, based on the data collected, to set appropriate and clear indicators for measuring the results or the contribution of funded actions in interventions within the eligible area that respond to the actual needs of the region. For the 2014-2020 programming period, the EU decided for the first time to use common indicators for all Operational Programmes of Member States (Annex I of Regulation (EU) 2021/1060, 24 June 2021).

Indicators are divided into two categories for Programmes EU Member States participate in, namely result indicators and output indicators. Furthermore, in the case of cross-border projects implemented between two countries in the process of joining the EU, impact indicators are also considered. Result indicators provide information about the immediate effects of a Programme's actions on beneficiaries and individuals directly affected. Output indicators are distinguished into "common" and "specific" (where this is deemed necessary) for each Programme and refer to deliverables produced by projects.

In summary, one could argue that a result indicator reflects the change brought about by a Programme in a region (e.g., accessibility to a remote tourist area, percentage of beneficiaries involved in tourism-related activities), while an output indicator describes the product generated as a consequence of funding (e.g., number of people trained, number of people hired, number of training seminars held, etc.). On the other hand, impact indicators measure the long-term effect of the Programme (e.g., improvement of the economy, society, the environment, etc.).

All Programmes set some desired results, which are linked to a region's wish or need for change through funded actions. It is in this context that respective result indicators are selected. The clearer the result indicators, the easier it is to understand the problem or need the region is facing, and consequently, the easier it is to measure and determine whether the objective has been achieved. On the other hand, output indicators reflect the actions and activities of a Programme rather than its goals.

Cross-border Programmes implemented by EU Member States select from the list of common indicators (Regulation 1299/2013, 17.12.2013 Annex) and may also establish additional specific indicators, if necessary, based on needs. Specific indicators do not replace common ones but complement them and contribute to further measurements to ensure better monitoring and evaluation of specific actions.

As for cross-border Programmes implemented by countries under the Instrument for Pre-Accession Assistance, participating countries set specific indicators based on the needs of an eligible area. The Programme document includes, for each Thematic Objective and Result, the indicators used to measure the achievement of the Programme's goals. This list of common indicators is not mandatory for countries implementing projects under this framework of cross-border cooperation.

In the case where one of the participating countries is an EU Member State and the other a candidate for accession, the Programme may, if necessary, choose indicators from the list in Regulation 1299/2013, 17.12.2013.

In the field of Tourism, the common indicator clearly mentioned in this area and included in the list of Regulation 1299/2013 mentioned above:

- **"Increase in expected number of visits to supported sites of cultural and natural heritage and attractions (unit of measurement: visits per year)."**

5.1 Selection of Indicators in Cross-Border Programmes in the Balkans

It has been noted that, depending on the stage of development of the partnership of countries participating in the cross-border Programmes, indicators are selected accordingly. Member States are required to follow EU policies; therefore, any issue must be addressed in a standardised manner. For this reason, member states are obliged to select common indicators from a specific list. However, when deemed necessary, programme-specific indicators may also be included to contribute more effectively towards achieving Programme objectives and desired outcomes.

On the other hand, since countries candidate for EU accession need to meet certain conditions for joining the union, they are required to collect information on various elements that directly or indirectly concern tourism. As a result, the indicators selected are greater in number and more specialised.

This practice, however, may involve risks, since it may lead to confusion or loss of focus. It would be preferable for indicators to be fewer in number and better targeted to avoid the possibility of data overlap, which could lead to questionable-quality results. It would also be advisable for the European Commission to consider such specific indicators – particularly in the case of candidate countries – so that a set of common indicators can be developed. This would establish a shared framework and a common point of reference, making monitoring easier and more effective for the Commission.

One notable issue regarding indicators in cross-border Programmes is the lack of qualitative measurement of actions and their results. Specifically, almost all Programmes place little emphasis on assessing the quality of interventions. While there is interest in creating new tourism products (new offers) and new types of tourism in an eligible area, qualitative evaluation of such actions is often overlooked. Even though the quality of tourism services contributes towards sustainable tourism devel-

opment, analysis of Programme documents reveals that this aspect is not given the attention it deserves. It should, however, be understood that for better development, promotion, and preservation of a tourism product, its quality must be an integral part of the indicators measured by participating countries.

Moreover, considering that these cross-border Programmes often fund many small-scale projects aimed at implementing local-level actions involving regional stakeholders, it might be even more beneficial to allocate funding for one large-scale, strategically important project. Specifically, a Programme could issue a tourism call approving, for example, 20 projects instead of 40, and the remaining funds may be used to launch a call for a strategic project with a larger budget and "stronger" stakeholders – such as ministries or research centres – that, albeit not located in the eligible area, could collaborate to target the development of that area and leave behind lasting benefits. Although many small projects can offer important benefits and development opportunities, the small-scale funding typical of Cross-Border Cooperation Programmes generally limits the impact that could otherwise be achieved more effectively under different circumstances.

Additionally, two serious issues must also be considered: the lack of data for certain regions, particularly in countries preparing for EU accession, which means that the target setting and corresponding indicators might not be appropriately chosen and be subject to challenge. Similarly, there are regions within EU Member States that are significantly underdeveloped—such as the cross-border region of Greece–Bulgaria (particularly in the region of Eastern Macedonia and Thrace)—where working with common indicators is particularly challenging. Although both countries are EU members, the cross-border region struggles to fully align with European policies. That said, the practice of using indicators facilitates drawing conclusions and evaluating the Programmes on the part of the EU. Even the difficulty in achieving a common indicator can yield insights that Member States and the EU can use accordingly.

Finally, another important point concerning the selection of indicators is that, in some cases, they do not clearly reflect the cross-border impact, which creates confusion in relation to the goals and the foundational principles of cross-border Programmes. Furthermore, in other instances, an indicator cannot be considered as the sole consequence of a Programme's actions. For example, for Programmes that use the "increase in overnight stays in hotels", as a result indicator, it must be understood that this indicator depends on a variety of socio-economic factors. The cross-border Programme contributes to this result only to a certain extent – something which is not clearly stated in the Programme documentation.

6. Comments on Indicators' Achievement

The Annual Implementation Report is a key monitoring tool for Programmes, used both by the Managing Authority and, more importantly, by the European Commis-

sion, since it reflects the current status of the co-financed projects being implemented. Specifically, it provides information on both financial data and output & result indicators.

The values reported in the Annual Report are cumulative, i.e. each year's report includes the achievements of all previous years. Two values are declared at any given time: one for selected projects and one for fully implemented projects. In the case of selected projects, the values reflect the estimates of project partners based on the progress of activities. It is self-evident that during the initial years of project implementation, estimates of beneficiaries regarding work progress are particularly important, since collecting concrete results is a time-consuming process and cannot provide meaningful data at the beginning of the Programming Period.

For output indicators, whether common or programme-specific, a baseline value is defined, and a target value is set for the year marking the end of the Programming Period. As for result indicators, which are linked to investment priorities, the baseline value is derived from recent data collected through evaluations or the need analysis of the Programme.

Before analysing the data per partnership scheme, it should be noted that Annual Implementation Reports were found for 18 of the 19 projects, with considerable difficulty in most cases. Few Programme websites are functional and user-friendly, although, under Regulation 1303/2013, transparency and publication of Programme data is a legal obligation.

Moreover, in many cases, the latest available Annual Implementation Report was for the year 2022, while in others, the report reflects the 2021 Programme status.

6.1 Programmes Implemented Between Two EU Member States

Analysing the values presented in the Annual Implementation Reports makes it evident that the figures are completed based on the calls for proposals launched by the Programmes and the approval of the projects. For this reason, while in the INTERREG V-A "Romania–Bulgaria 2014–2020" Programme the indicator values start being reported in 2015, in the INTERREG V-A "Slovenia–Croatia 2014–2020" Programme they start in 2016, and in the INTERREG V-A "Greece–Bulgaria 2014–2020" Programme in 2017.

It should also be mentioned that in the Annual Report of the INTERREG V-A "Romania–Bulgaria 2014–2020" Programme, there is no reference to the result indicator value for any year. In fact, remarks note that this value will only be recorded in the final report, according to the methodology outlined in the Programme document. Similarly, in the INTERREG V-A "Slovenia–Croatia 2014–2020" Programme, result indicator values are only provided for three years (2018, 2020, and 2023).

Additionally, across all Programmes, it is noted that estimated values provided by beneficiaries differ from those representing the actual achievement of targets. In two

of the three Programmes in this category, the discrepancy is quite large, indicating that some beneficiaries may lack the knowledge and experience necessary to make accurate estimations, which can result in conclusions that do not reflect reality.

Nevertheless, when analysing output indicator values, it becomes clear that, in two of the three Programmes, some indicators did not reach their target values. More specifically, in the INTERREG V-A "Romania–Bulgaria 2014–2020" Programme, the projects managed to achieve two of the three output indicators. According to the Annual Report, this is justified by the fact that eleven projects under this Specific Objective were still under implementation and were to be concluded by the end of 2022.

On the other hand, the INTERREG V-A "Greece–Bulgaria 2014–2020" Programme did not manage to meet any of its output indicators. According to the Annual Report, this is because eleven projects under this Specific Objective were still being implemented and were also to be completed by the end of 2022.

In contrast, the INTERREG V-A "Slovenia–Croatia 2014–2020" Programme not only achieved its target values for all six output indicators but significantly exceeded them.

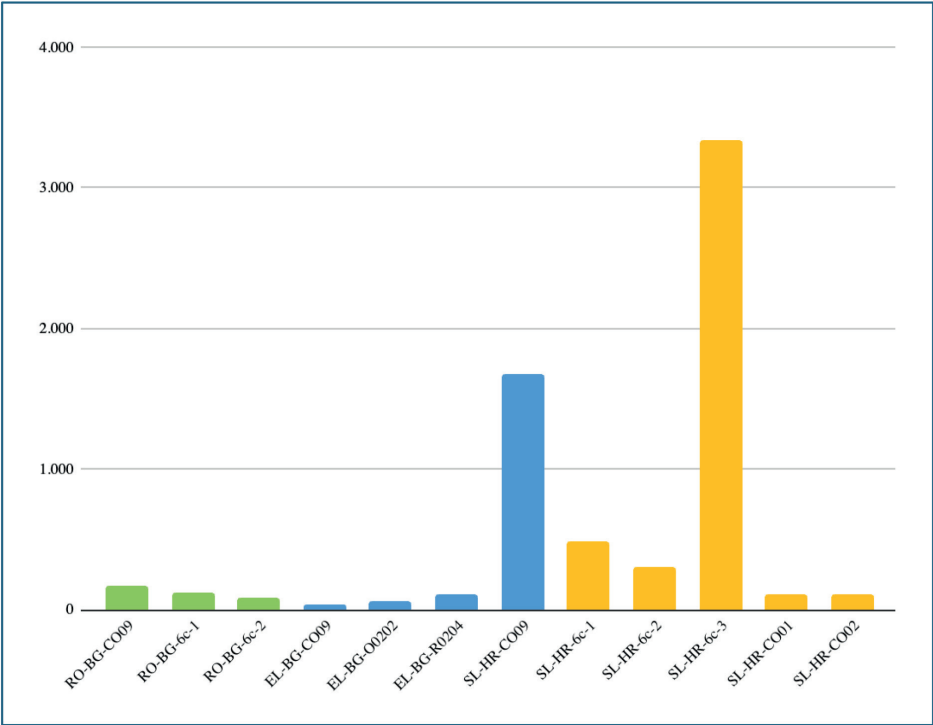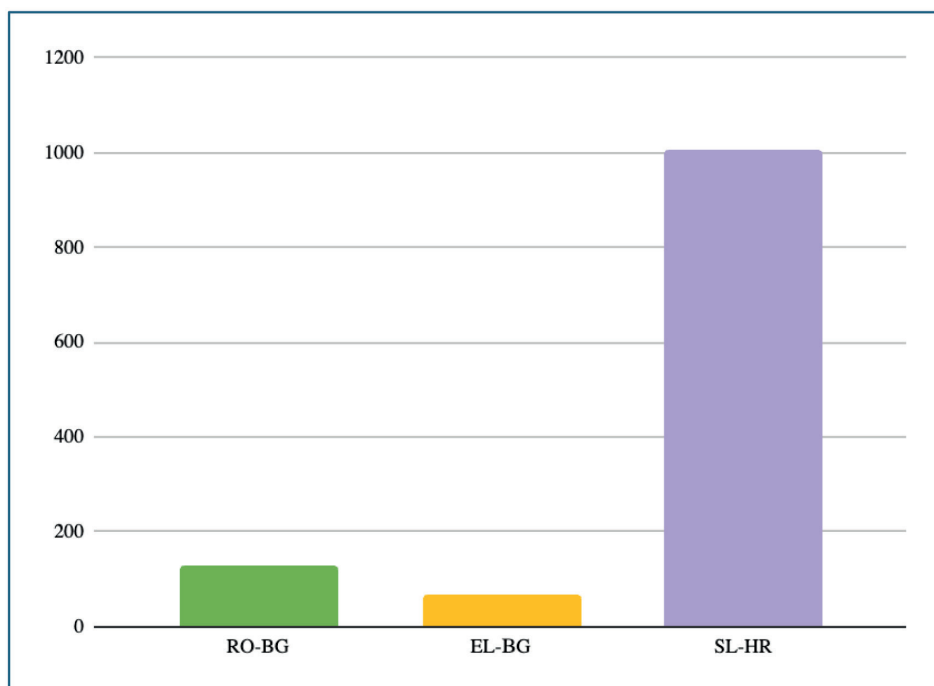**Chart 1**: % Target Achievement Rate by Indicator by Programme

Chart 2: % Target Achievement Rate by Programme

6.2 Programmes Implemented Between an EU Member State and a Candidate Country for EU Accession

A pattern similar to the case of partnerships between EU Member States is observed here: in many instances, the final indicator value for years 2021 and 2022 significantly exceeds the target value, presenting a gradual and steady increase compared to the previous year. However, for several indicators, there is a sharp spike in values in the last reporting year (2021 or 2022), showing a remarkable increase compared to respective values of the previous year.

In a few cases, the indicator value in the final reporting year is lower than the target value -this is seen, for example, in INTERREG IPA II CBC "Bulgaria – former Yugoslav Republic of Macedonia, 2014–2020" and INTERREG IPA II CBC "Bulgaria – Turkey 2014–2020." This is likely due to project extensions approved by the Managing Authority that were requested due to the COVID-19 pandemic or due to signing new funding contracts and, consequently, launching additional projects in 2021. This occurred in the INTERREG IPA II CBC "Romania – Serbia, 2014–2020" Programme and probably caused delays in data collection.

In another case, such as the INTERREG IPA II CBC "Bulgaria – former Yugoslav Republic of Macedonia, 2014–2020" Programme, only the result indicator value for 2018 was reported, and it is noted that the reference years for these indicators are 2018 and 2023. Furthermore, an output indicator of the Programme (2.3.3. Number of Participants in Youth Initiatives) showed a value of zero until 2019. In 2020, however, the indicator aligned with the beneficiary's estimate (240) and greatly exceeded the Programme's target value (150).

It has also been observed that the target value sometimes differs from both the actual data and projections. This occurs because, during the mid-term evaluation, indicators are reanalysed. When a different trend is identified (increase or decrease), the Programme is then obliged to redefine the indicator value to reflect reality, based on data collected.

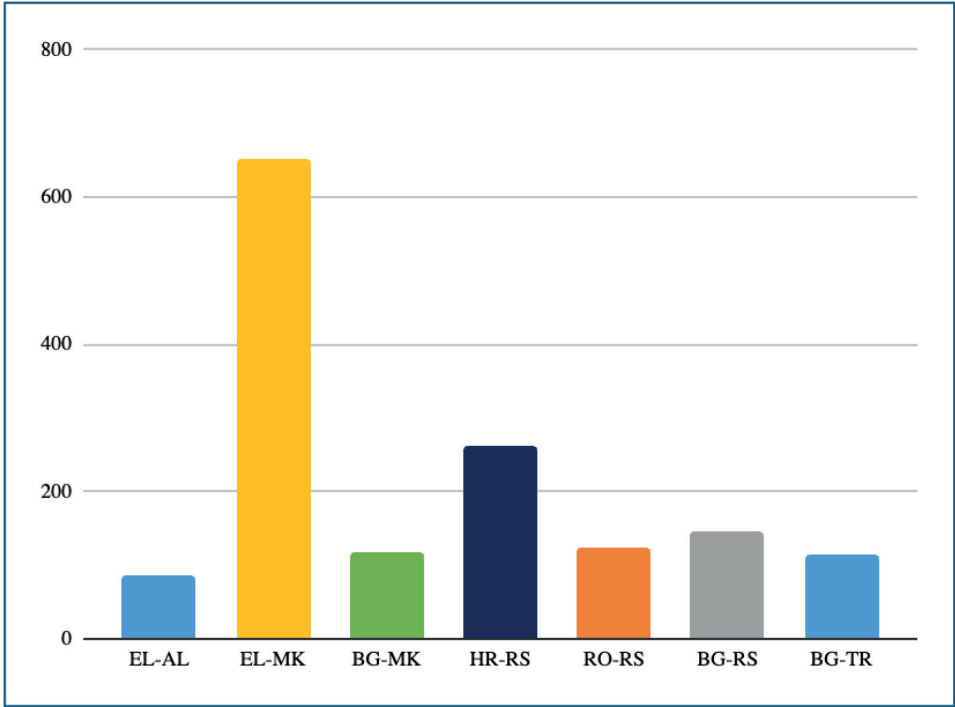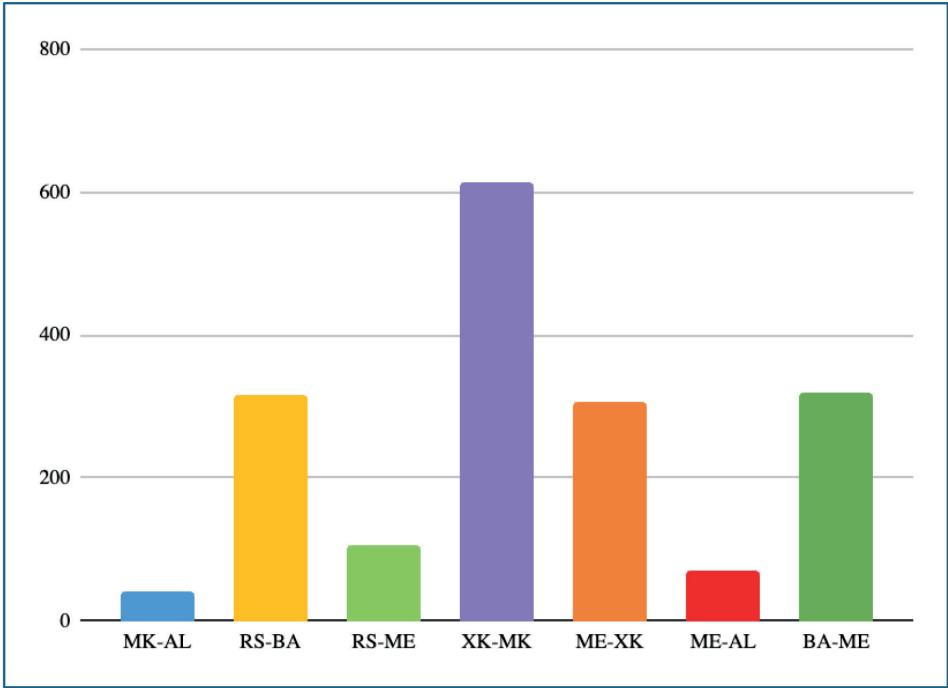**Chart 3**: % Target Achievement Rate by Programme

6.3 Programmes Implemented Between Two
Candidate Countries for EU Accession

There are nine programmes under this partnership model in the Balkan region. In most cases, it was nearly impossible to find material online. However, in response to a request for documentation, nearly all programmes – except for INTERREG IPA II CBC "Serbia – former Yugoslav Republic of Macedonia, 2014–2020" – provided the material requested.

Regarding programmes implemented between two EU candidate countries, indicators are categorised into three types: outputs, results, and impact.

Furthermore, in certain programmes there is no differentiation of indicators by Specific Objective, but rather by Result. The title of the Specific Objective remains the same, while the indicator category is adjusted based on the Result.

Chart 4: % Target Achievement Rate by Indicator by Programme

Chart 5: % Target Achievement Rate by Programme

6.4 Comparative Analysis of Target Achievement across Partnership Models

By comparatively analysing Programmes by partnership model, it becomes evident that Programmes implemented between two EU Member States have achieved their targets to a greater extent than those implemented between the other two country pairings.

It is also clear that, overall, all three partnership models have not only achieved but significantly exceeded their targets, with a success rate of 399.21% for country pairs consisting of two EU Member States, 214.08% for country pairs consisting of one EU Member State and one candidate country, and 252.93% for country pairs consisting of two candidate countries for EU accession.

Chart 6: % Target Achievement Rate by Partnership
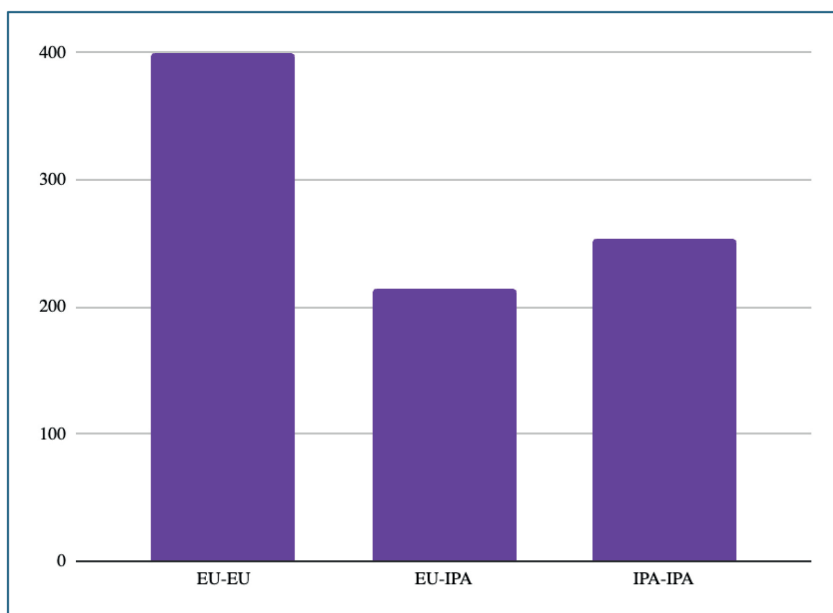
6.5 Conclusions and Evaluation of Indicator Achievement

Regarding indicator values and their achievement, as already mentioned, finding the Programme's Annual Report proved difficult – if not impossible – in several cases. This unavailability of public online data hinders the formation of a comprehensive picture of the contribution of cross-border programmes to tourism development. More specifically, annual reports were found for 18 of the 19 projects. Notably, among the seven Programmes implemented between candidate countries for EU accession, only one report was found, the one concerning the Cross-Border Cooperation Programme "Former Yugoslav Republic of Macedonia – Albania, 2014–2020."

Additionally, it should also be taken into account that, until an on-site inspection is carried out by the competent Authority, measurements included in the Annual Report primarily reflect declarations made by beneficiaries. At this stage, the Managing Authority/Joint Secretariat (MA/JS) is not in a position to verify data authenticity or possess all necessary evidence to validate information. Only after visiting beneficiaries' facilities or conducting thorough research into beneficiaries' records can the authorities obtain a complete and accurate picture of the achievement of indicators. Therefore, a project picture presented in the Annual Report may not fully reflect

reality, and values may differ in the Final Report that Programmes are required to submit at the end of programming period.

In the same context, management efficiency remains questionable for some countries. Consequently, the fact that full freedom and trust are given to a beneficiary to use their preferred methodology for collecting indicator data raises questions about the reliability of the figures submitted in Annual Reports.

It should also be noted that there was a case (INTERREG V-A "Romania – Bulgaria 2014–2020") where no value for the result indicator was reported in any year of the Annual Report. In fact, comments specify that the value will only be reported in the Final Report, as outlined in the Programme's methodology document. This, once again, highlights the extensive discretion granted by the EU to countries for setting and applying specific conditions for implementation. However, this practice may conceal risks related to project monitoring and, consequently, achieving Programme objectives. The competent Authorities may lack time and resources at the end of the programming period to intervene, seek solutions, and take appropriate actions to reverse negative trends and improve outcomes.

Furthermore, Annual Reports clearly show the impact of the COVID-19 pandemic on project implementation. The interruption of project activities and the extension of deadlines are factors that affected target achievement. For this reason, in some cases, targets might only be met during the final project implementation period.

There were also Programmes the target value of which was achieved in the early years of implementation. This may have occurred either because the countries set low targets or because more projects were approved than initially planned, leading to a greater volume of data/more measurements. In the first case, this reflects a countries' inability to set ambitious targets based on ex-ante evaluation data, while, in the second, it reflects the Authorities' inability to effectively manage the data of the first call for proposals when designing the second call.

Additionally, the lack of sufficient statistical data in some countries casts doubt on baseline values reported in the Annual Report and, consequently, on the achievement of targets, as well. This is particularly critical in cases where the objective is to increase a value by a certain percentage from the baseline, as incorrect reporting of the baseline can distort the entire picture of the indicator.

Finally, a difficult yet important factor in accurately recording indicators is coordination between countries when defining and capturing the cross-border dimension of certain measurements. More specifically, it requires considerable effort for two countries to translate and record an indicator in a uniform manner. For this purpose, Authorities must ensure that beneficiaries follow a common methodology and code of practice when collecting data, so that analysis is consistent and aligned with EU guidelines.

In conclusion, as shown in the charts depicting target achievement rates by Programme partnership models, success is apparent – with the target value being significantly exceeded. However, these results may be open to challenge. As previously mentioned, the possibility of submitting inaccurate measurements of indicators is a real concern and requires further investigation.

7. Conclusions – Discussion – Proposals

To summarise what has already been analysed, it is evident that Cross-Border Cooperation (CBC) Programmes have contributed to the development of eligible areas in the tourism sector. New tourism products have been created, additional people have been trained in the fields of tourism and culture, the number of tourists' overnight stays in the area has increased, jobs have been created, etc. Therefore, these Programmes impact tourism by offering products and services or infrastructure projects in a region. However, the level of development and the degree of contribution of these Programmes remain open to discussion.

In the same context, the objective of developing tourism in a specific area also affects the policy planning of a country, and, consequently, the adoption of Programmes for funding in order to develop that sector. Given that two countries share the goal of developing tourism in a cross-border region, the implementation of joint projects – and, therefore, forging smooth relations and cooperation – is essential. However, for effective cooperation between two countries, establishing a common framework with strong structures and clear governance mechanisms is a prerequisite for proper management, monitoring, and evaluation of Programmes.

Even though policy is influenced by CBC Programmes and tourism, it has been noted that ex-ante analyses of evaluations and needs – the documents a CBC Programme is based on – tend to reflect the central government's policy rather than the actual needs and requirements of the local area being funded. More specifically, each Programme's design study is carried out per country. There is no common study or shared questionnaire for residents of the eligible cross-border region. On the contrary, each country shapes its own policy, and based on that, Priorities for the respective CBC Programmes are developed under the supervision of the EU.

However, this practice may lead to erroneous conclusions about the needs of a region. Consequently, the indicator selected to monitor the Programme, which should reflect the area's needs, might not align with actual needs, and measurements may either be low – due to an inability to implement the project (due to lack of necessary tools or knowledge) – or very high, because the relevant need had already been fully addressed in the past.

At the same time, it should be considered that in several countries, governance structures are still at the early stages of development. This is especially true for the countries formed after the dissolution of Yugoslavia, where governance systems have

only recently been restructured, resulting in lack of a universal approach to Programme management among participating countries. Moreover, the lack of knowledge and available data in some countries further complicates the situation and hampers cooperation between nations in producing accurate measurements and proper monitoring of the Programmes on both sides of the border. As previously mentioned, in certain partnership schemes the absence of baseline data at a given point in time makes it impossible to set a reference value, even though the indicator is supposed to measure the increase from that point onwards due to the Programme's contribution.

Taking all the above into account, it becomes clear that, in some cases, it is possible that measurements are inaccurate and do not reflect reality. Beneficiaries may, due to a lack of knowledge, experience, information, and sufficient data, unknowingly submit incorrect measurements to the Managing Authority overseeing the Programme.

Similarly, the nature and characteristics of some indicators are also called into question. Specifically, there are cases in which the target cannot solely be attributed to the implementation of a CBC Programme but, rather, to results from various other contributing factors not considered in the measurement of an indicator. Therefore, an increase in overnight stays in a cross-border area cannot solely be attributed to the Programme's implementation; other social, economic, and political factors should also be considered.

Furthermore, another issue that becomes evident from the study and analysis of CBC Programmes is that, although cooperation between entities from the two bordering regions exists, the degree and quality of that cooperation is not easily perceived, since it is not measured in qualitative terms. Undoubtedly, two countries have cooperated to implement a project at the border, but the level and quality of cooperation and involvement is neither apparent nor evaluated. However, quality is a key factor in sustainable tourism development, especially when it comes to services and products.

Based on the issues raised in this paper, one proposal to improve the implementation of CBC Programmes is to separate them from central government planning. Differentiating them from large Sectoral Operational Programmes could help shape a specific policy for border areas with clear objectives that truly reflect the needs of the region. This way, regional development could be promoted more systematically.

Additionally, approving and funding fewer but more targeted projects focused on a small number of goals and groups could lead to greater development in a specific area of tourism. Funding many and varied actions significantly diminishes the impact of such Programmes in any given region. The results of the projects are small, as is their contribution to and impact on the local community. On the contrary, focusing on a single area could yield greater development and more clearly measurable outcomes.

Moreover, drafting clear, common guidelines by the EU and training participating countries in CBC Programmes regarding management, monitoring, and evaluation

should be key-prerequisites for funding approval. It must be recognised that coordination and implementation of a common methodology for measuring indicators are fundamental aspects of a Programme and contribute towards producing accurate and valid conclusions about the situation in a cross-border region.

In conclusion, it should be understood that, although there are many challenges and difficulties when two countries – or more specifically, two border regions – collaborate, the benefits of cross-border cooperation for a region can be significant at many levels. Cooperation of two remote areas can lead to improved bilateral relations, regional stability, economic growth, and exchange of cultural elements, opening up new horizons on both sides of the border.

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