

Zdzisław W. PUŚLECKI

Poznan

## Innovations in the Strategy of the European Union's Economic Growth

**Abstract:** The main aim of the paper is the presentation of the innovation system in the strategy of the European Union's economic growth. According to the new theory of growth being the best theoretical foundation for the concept of the innovation system, the primary factor influencing the economic growth is the endogenous technological progress. To the particular goals of the research belong the presentation of the model of innovation system, theoretical concept of the innovation system and innovation process, constructed advantage, the Triple Helix model, Innovation Union, Europe 2020 strategy, Horizon 2020 as the financial instrument implementing the Innovation Union. The problems were researched by quantity and quality scientific methods. Utilised also, deduction and induction, statistic and prognostic methods. The important results of the research is the conclusion that in the innovation process also in the European Union very important are the connection between science, market (industry) and governance. There is positive dependence between innovation activity and effectiveness of the innovation process. The more interaction and cooperation it can observe on the regional level than on the state. The new programme of the Europe 2020 and Innovation Union are very important factors of the strategy the EU economic growth.

**Key words:** technological progress; innovation system; innovation process; constructed advantage; Triple Helix model; Innovation Union; Horizon 2020; Europe 2020; economic growth.

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### Introduction<sup>1</sup>

Europe 2020 and the Innovation Union initiative have clearly signalled the EU's intention to rise to the challenge. In a changing world, the representatives of the EU want that the EU to become a smart, sustainable and inclusive economy. These three mutually reinforcing priorities should help the EU and the Member States deliver high levels of employment, productivity and social cohesion. Concretely, the Union has set five ambitious objectives – on employment, innovation, education, social inclusion and climate/energy – to be reached by 2020. Each Member State has adopted its own national targets in each of these areas. Concrete actions at EU and national levels underpin the strategy. Europe 2020 focuses on achieving smart growth, while the Innovation Union sets out measures to contribute to this aim, including increasing investment, refocusing R&D and innovation policy on major societal challenges, and strengthening the links from frontier research right through to commercialisation. A key challenge for the EU in implementing its strategy will be to build a next-generation expenditure programme which matches this level of ambition in both its budget and its aspirations.

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The challenges facing the European Union economy continue to be daunting. In particular, several Member States' economies continue to face large deleveraging of the private and public sectors. This deleveraging reflects the unwinding of accumulated financial imbalances linked to previous unsustainable expenditure levels financed by credit, in some cases promoted by asset price bubbles in the private sector and in others by the lack of fiscal rigour in the public sector. This is now weighing on growth, as spending is reduced and income directed to debt repayment.

### **Model of innovation system**

The modern approach to innovation, namely the so-called chain model, underlines the complexity of the innovation process. The innovation of companies depends on the quality of relations between other companies that generate innovation in the economy. It has been seen in the concept of an innovation system that translates the observations of nonlinearity and the chain-like nature of innovation process into the functioning of the economy, development of which depends on the generated innovations (Wójnicka, 2008).

According to this concept, the economy is not only the institutions which create it (meaning entities), but also the results of synergies, which arise as a result of mutual cooperation. Therefore, apart from the institutions that generate innovation (companies), the research-and-development sphere or intermediaries in the transfer of innovation in the concept that sees the importance of different interactions that occur between them. The innovation system consists therefore of institutions and relations between them, thanks to which the particular economy creates an efficient mechanism for the distribution of knowledge with a view to its further processing. A significant role for the efficiency of the innovation system plays the environment, especially the consumers of innovation, who create the demand. They are important in particular nowadays in the times of the market-driven economy. Companies monitoring the tastes of consumers, create new needs through innovations.

Also important for the efficiency of the innovation system is the infrastructure of the environment, meaning the legislation, and in particular the protection of intellectual property rights as well as the systems of education, financing and transport. A key feature of the systems is the historically established culture and the accumulation of knowledge and experience making their character unique. Moreover, for the efficiency of the innovation system as distributing knowledge, its openness to influences and knowledge from other systems and the interactions with them (Wójnicka, 2008).

An efficient system also has to be fully developed, i.e. it should not be missing any needed elements. The system will be the system if its entities are linked, because the system is a ordered arrangement of elements, between which there are certain relationships which constitute a whole. Such a system will be as strong as its weakest link (Wójnicka, 2008).

Companies are a critical element in the innovation system, and their health determines the competitiveness of countries and social well-being. In the view of the new theory of economic growth developed by such researchers as Kenneth Arrow, Paul Romer and Robert Lucas, knowledge is the primary factor in determining productivity. According to the new theory of growth being the best theoretical foundation for the concept of the inno-

vation system, the primary factor influencing the economic growth is the endogenous technical progress. In the endogenous theories workers are seen as an element capable of active interaction and creating changes in the production process, and therefore a huge role in increasing productivity is ascribed to human capital and knowledge.

P. Romer has enabled the analysis of learning process, noticing that thanks to the gained external benefits from it, the knowledge inspired by private investments becomes publicly available. In addition, the latest examining of endogenous progress assumes that it is the result of investments by companies in the work of R&D. As Carlsson reckons every theory that is trying to endogenize the technological change must take into account the diversity of products, processes, economic entities and institutions. In addition, the interdependence of these different actors will be important, i.e. it must relate more to the system than individual units. From the perspective of the theory of growth based on the endogenous technological progress, the efficient innovation system – distributing knowledge, meaning accelerating the learning processes in the economy, will stimulate a higher general level of the particular economic development (Wójnicka, 2008).

The concept of the innovation system emphasizes the cooperation as well as the flow of technology and information and various relationships and interactions between individual elements as a condition conducive to the success of the innovation process. OECD gives, among others, the following definitions of innovation systems derived from analyses on national innovation systems:

- the network of public and private sector, whose activities and interrelations initiate, import, modify and expand new technologies;
- the group of institutions which both together and individually contribute to the development and diffusion of new technologies, and creates a skeleton, within which the governments formulate and implement the policies influencing the innovation process; the system of interconnected institutions that create, store and transfer knowledge, skills and tools that define new technologies (Wójnicka, 2008).

Innovation systems are tested at various levels. The majority of analyses are conducted on national innovation systems, since it is considered that the characteristics distinctive to individual nations most affect the distinctness of the innovation process in companies: the type and number of institutions and their behaviour (Wójnicka, 2008). It innovative firms provide frames and value systems that emphasise innovation as central of the company's mission and put their money literally where their mout is. Encouraging innovation, however, is a complex balancing act that consist of three components: first, the balancing of goals which have to be linked to the corporate mission, but not be overly specific; second, the balancing of reward through a system that recognises members' contribution, but does not encourage overly risky behaviour; and third, the balancing of time pressures (Greenberg, Baron, 2003, p. 536–538), (Anheier, Fliegau, 2013).

### **Theoretical concept of innovation system and innovation process**

The theoretical concept of the innovation system is a comprehensive look at the innovation process. Fumio Kodama points out that the existing categories of innovation and the measurements still do not cover all types of innovation. After Charles Freeman, he

distinguishes, besides radical and improving innovations, other kinds of technological change like the change of the technological system and techno-economic paradigm. In the modern economy, the innovation can be realized by combining products and processes held by various companies from various sectors of the economy, as well as businesses and other entities, particularly from the field of research and development. In many industries new economy causes modularity of innovative activity. Innovations – their individual modules, are subcontracted to particular vendors, so that the company achieves flexibility and reduces costs (e.g. large automotive factory). The necessary response to the modularity of economy is a comprehensive approach to the innovation process (Wójnicka, 2008).

Technological change, is now very fast, but often meets a deep inertia among social institutions. Innovations determining the competitiveness have not only technological dimension, but also the organizational and personal one – the quality of human resources is extremely important for the profitability and the development of an organization. Moreover, significant is the nature of the innovation process that is interactive and based on the cooperation. The today ground-breaking technologies are so complex that individual companies would not be able to develop them alone. Their complexity makes it impossible to understand all the details by a single expert, as well as the knowledge on this topic may not be fully and thoroughly transferred to the other people (Wójnicka, 2008).

Managers of many successful companies often are ashamed to admit that they cannot understand the reasons for the success of their corporations. Usually however, these are companies largely based on a variety of networks. In the case of the complex technology, a network includes a dozen of companies and different governmental agencies and organizations of the non-profit sector, such as universities. In addition, such a network, integrating various skills, must not be static. Innovative networks are continually evolving. Similarly, particular elements are still subject to common learning process. Often cited here as an example is Japan, where companies can effectively implement complex technologies. The factors of success that are mentioned here is the participation of the government in the innovation process – the support from his part and the specific culture which fosters cooperation, trust and building innovation on non-material knowledge (Wójnicka, 2008).

The new nature of the innovation process makes it necessary to adapt not only to its standards of measurement, but also the law (Wójnicka, 2008). For example, in the United States of America in the 1980s. the anti-monopolistic law was changed so as to enable the creation of consortia of research and development between companies. In a later period it appeared that companies must obtain a permit for a consortium, if it relates to companies from the same industry. In the European Community in 1985 there was introduced a block exclusion from the article 85 of the Treaty of Rome setting out the rules of competition law for certain categories of consortia of research and development (Wójnicka, 2008).

The concept of the innovation system is a comprehensive way to view the innovation process. It draws attention both on the institutional aspects – the need to bring other institutions supporting the innovation process of companies, but especially on the relations between companies and those institutions, as well as between companies (Wójnicka, 2008). The interactions between companies and institutions shall mean their mutual

openness and knowledge about the generated innovations, which will enable a more rapid diffusion of knowledge and innovation in the economy and social system to adapt more rapidly to technological change (Huges, Irfan, 2008).

Many studies point at the positive relationship between cooperation and innovation and competitiveness of businesses. In Canada on average 1/3 of the industrial companies participates in the various agreements for cooperation. A greater percentage of cooperating companies is among large companies – 37.2% than the small and medium-sized companies – 28.3%. At the same time, among large companies there are more innovative companies (89.6%) than the average for the entire industrial sector is (82.3%) (Wójnicka, 2008). The cooperation is of crucial importance for an increase in creativity and innovation in the UK. From the research based on the internet survey conducted by the Confederation of British Industry (CBI) in the year 2000 it appears that 75% of 350 companies surveyed co-operated with other companies, researchers, consultants, research institutes or private research companies over the last 3 years (2000–2003) (Confederation of British Industry (CBI), 2001).

Companies and other innovation system actors can be linked in the innovation process in many ways. The basic traditional method are the transactional links based on the market. However, the increasingly frequent are non-market links, which are manifested in the cooperation agreements concerning joint research and development and innovation activity. The cooperation between the partners in the economic process and particularly the innovative one shows increasingly popular concepts of networks and clusters and innovation systems, among both researchers and politicians (Wójnicka 2008).

An efficient innovation system introducing innovation and competitiveness of companies must have the proper linkages between science, industry and government. The scientific and technical policies of the countries moving towards the knowledge based economy favour the linkage between universities, industry and government. At the same time, the science sector should fall within the network of links with local, regional, national and foreign partners. As a result of such activity the boundaries between institutions shall disappear, and the entire system becomes more dynamic. The national policy can affect the science sector more than companies, so stronger links between science, industry and government can be inspired by the reform of the educational system.

The research into the innovations in companies have demonstrated that there is much more interaction and cooperation among the elements of the innovation system that occurs at the level of the region than the country. This results in the emphasis in recent years to research the potential and the regional innovation systems. In response to the need and assuming greater efficiency of the actions taken nearer to the entities, most regions that possess their own local authorities creates their own policy and proinnovation strategy. The reflection of the importance of the regional level for the innovation process are the European Union programs supporting the creation of regional innovation strategies – RIS, regional initiatives for the innovation and technology transfer – RITTS, and similar national programmes as e.g. InnoRegio in Germany (Economic Bulletin, 2002).

The latter point highlights the political nature of the innovation process (Kim et al., 2007) that requires intra-organisational leadership as well as bargaining and persuasion across multiple levels. The complex nature of the innovation process often results in

failures where invention simply do not take off and remain nothing more than intriguing ideas. Their invention makes it, but their subsequent success varies widely (Anheier, Fliegau, 2013).

### Constructed advantage

It has been suggested that the idea of absolute advantage in foreign trade originates with Adam Smith and developed by Ricardo and Torrens to comparative advantage and after was developed by Marshall and Ohlin. Foray & Freeman (1993) re-introduced it yet scarcely explored it. More attention has been devoted to it in comparison to other well-known forms of economic advantage by De la Mothe & Mallory (2003), as follows:

**Comparative Advantage** – This idea, deriving from David Ricardo and foreign trade theory, explained economic welfare in terms of initial resource endowments traded between regions and nations. While policies were not excluded from such an analysis, they mainly added up to forms of mercantilism, and Ricardo advocated intervention regarding technological change. The overwhelming framework which government policy gave rise to and which promoted comparative advantage was *laissez-faire* (Cooke, Leydesdorff, 2006).

**Competitive Advantage** – Thus countries with a large labour supply would naturally export goods that were labour-intensive (e.g., China), while countries that were technologically advantaged (e.g., the United States) produced and exported technologically advanced products. The paradox arose when advanced economies exported labour-intensive goods as well as technologically intensive goods. Krugman (1995) and Porter (1990, 1998) noted the competitive advantage of firms in which distributed supply chains and the role of large domestic markets became accepted (Cooke, Leydesdorff, 2006).

**Constructed Advantage** – The “new competitive advantage” (Best, 2001) highlights regional development economics, the dynamic of which draws upon constructed advantage. This knowledge-based construction (Dunning (ed.), 2000) requires interfacing developments in various directions:

- **Economy** – regionalization of economic development; “open systems” inter-firm interactions; integration of knowledge generation and commercialization; smart infrastructures; strong local and global business networks.
- **Governance** – multi-level governance of associational and stakeholder interests; strong policy-support for innovators; enhanced budgets for research; vision-led policy leadership; global positioning of local assets.
- **Knowledge Infrastructure** – universities, public sector research, mediating agencies, professional consultancy, etc. have to be actively involved as structural puzzle-solving capacities.
- **Community and culture** – cosmopolitanism; sustainability; talented human capital; creative cultural environments; social tolerance. This public factor provides a background for the dynamics in a Triple Helix of university-industry-government relations (Leydesdorff, Etkowitz, 2003).

### **Triple Helix model**

It was Schumpeter who first recognized the importance of knowledge in the economy by his reference to “new combinations of knowledge” at the heart of innovation and entrepreneurship (Schumpeter, 1911). Studies of the knowledge-based economy (Dunning (ed.), 2000) focus not only on human capital, but also on the sectoral characteristics of the knowledge factor (Nelson, 1982; Pavitt, 1984). An innovation system can be defined at the national level (Freeman, 1987, 1988; Lundvall, 1988, 1992; Nelson, 1993), at the regional level (Cooke, 1992; Cooke et al., 2004), or in terms of a dynamic model like the Triple Helix of university-industry-government relations (Etzkowitz, Leydesdorff, 2000; Leydesdorff, 1994).

In the Triple Helix model constructed advantages have been conceptualized as the surplus value of an overlay of relations among the three components of a knowledge-based economy: (1) the knowledge-producing sector (science), (2) the market, and (3) governments. Those places with research universities witness a growing demand for knowledge transfer to industry and, through government, to society (Etzkowitz, Leydesdorff, 1998; Etzkowitz et al., 2000). Moreover, the spread of universities is reasonably uniform in advanced industrial countries. For research knowledge, industry and government can be expected to pay more for privileged access to knowledge-based growth opportunities by funding research, stimulating closer interactions among the three institutional partners, subsidizing infrastructure (e.g., incubators and science parks), and stimulating academic entrepreneurship skills and funding (Cooke, Leydesdorff, 2006).

### **Innovation Union**

The key driver of the problems is Europe's structural innovation gap: compared to its competitors, Europe's patenting performance is weak and it lags behind in developing new products, new processes and new services. To boost productivity and growth, it is critically important to generate breakthrough technologies and translate them into new products, processes and services. Europe has taken an early technological lead in many key technology areas, but in the face of growing competition its advantage is tenuous, and has not translated into an innovative and competitive lead. A timely and targeted European policy is needed for bridging the “valley of death” if Europe is to remain competitive (SEC 1428 final 2011).

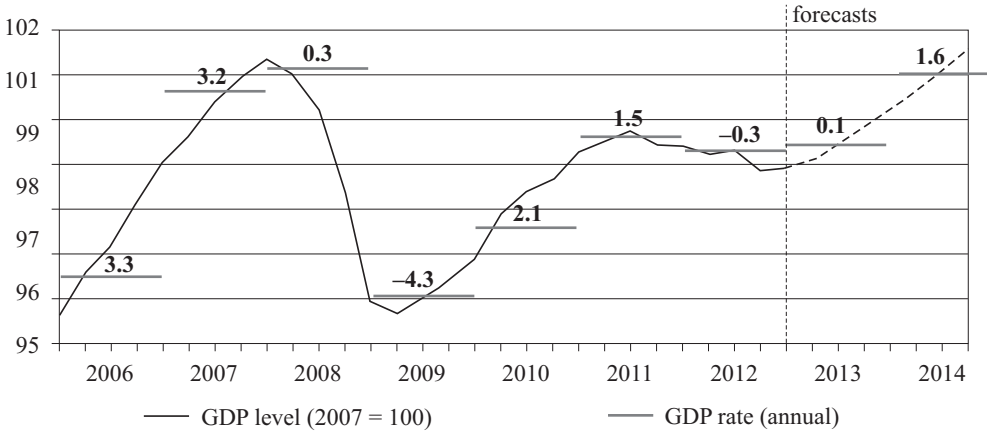
This key driver is underpinned by the following structural problem drivers:

- Insufficient contribution of research and innovation to tackling societal challenges;
- Insufficient technological leadership and innovation capability of firms;
- The need to strengthen the science base;
- Insufficient cross-border coordination.

The EU recognizes the urgency of the situation, and is responding with new policy strategies. It is important to underline that the Innovation Union is one of the seven flagship initiatives of the Europe 2020 strategy for a smart, sustainable and inclusive economy. Innovation Union is the European Union strategy to create an innovation-friendly environment that makes it easier for great ideas to be turned into products and services

that will bring economy growth and jobs (Figure 1, Figure 2). The Annual Growth Survey for 2013 launches the 2013.

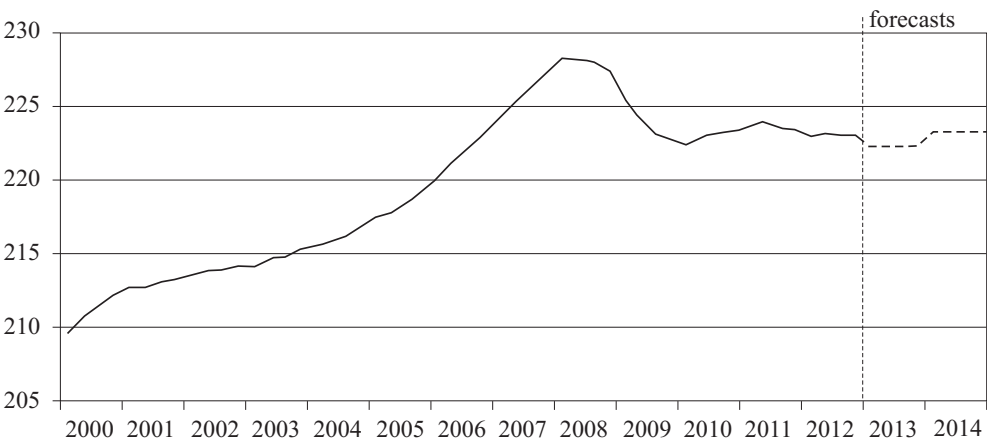
**Figure 1. GDP trends in the EU: levels and rates**



**Source:** Growth, competitiveness and jobs priorities for the European Semester 2013. Presentation of J. M. Barroso, *President of the European Commission to the European Council of 14–15 March 2013*, <http://europa.eu/news/pdf/sg.2013-00286-01-04-eu.tra-00.pdf>, 24.01.2014.

European semester for economic policy coordination, which ensures Member States align their budgetary and economic policies with the Stability and Growth Pact and the Europe 2020 strategy. It is the basis for building a common understanding about the priorities for action at the national and EU level as the EU seeks to return to a path of sustainable growth and job creation.

**Figure 2. Number of people employed in the EU (in million)**



**Source:** Growth, competitiveness and jobs priorities for the European Semester 2013. Presentation of J. M. Barroso, *President of the European Commission to the European Council of 14–15 March 2013*, <http://europa.eu/news/pdf/sg.2013-00286-01-04-eu.tra-00.pdf>, 24.01.2014.

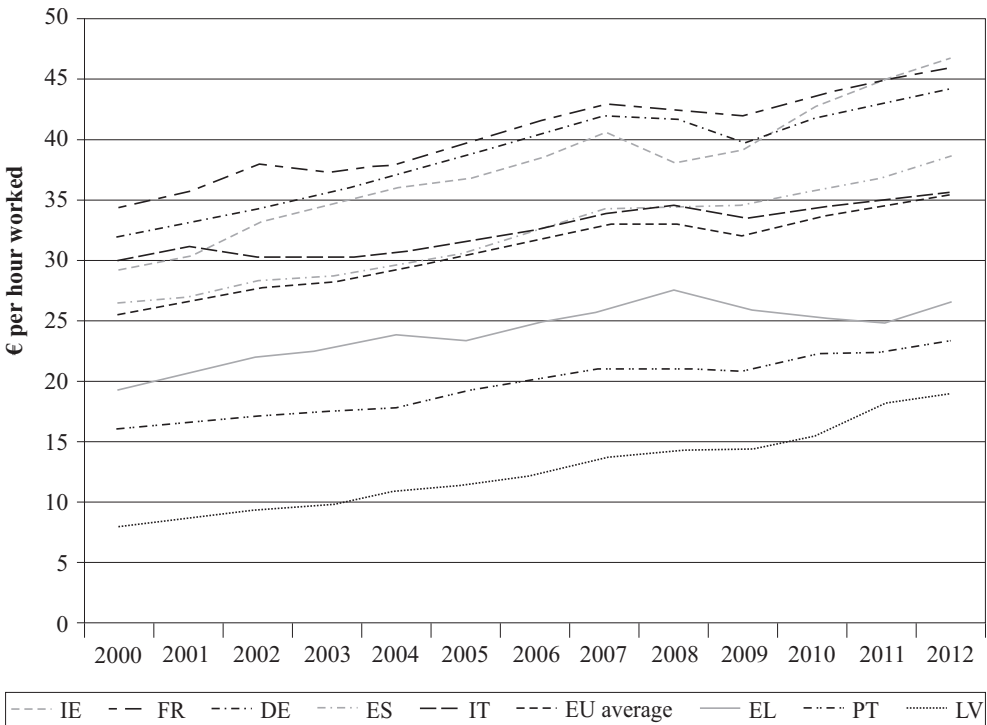


The Annual Growth Survey should feed into national economic and budgetary decisions, which Member States will set out in Stability and Convergence Programmes (under the Stability and Growth Pact) and National Reform Programmes (under the Europe 2020 strategy) in April 2013. These programmes will form the basis for the European Commission's proposals for country-specific recommendations in May 2013.

### Europe 2020 strategy

The budgetary and economic policies with the Stability and Growth Pact and the Europe 2020 strategy are the basis for building a common understanding about the priorities for action at the national and EU level as the EU seeks to return to a path of sustainable growth and job creation. It must be emphasized that the EU economy is slowly starting to emerge from the deepest financial and economic crisis in decades. To restore confidence and return to growth, it is essential that Member States maintain the reform momentum, and for this reason the Commission recommends focusing on the same five priorities that were identified in last year's Survey (Figure 3):

**Figure 3. Productivity levels and trends 2000–2012 (hourly productivity levels in Euro per hour worked)**



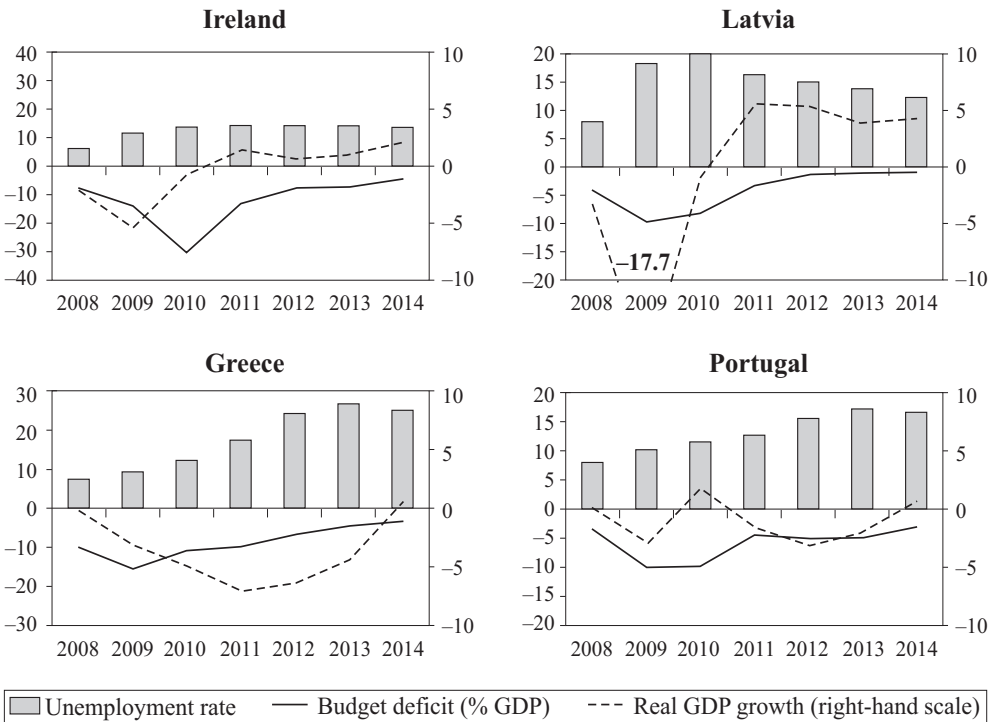
Source: Growth, competitiveness and jobs priorities for the European Semester 2013. Presentation of J. M. Barroso, President of the European Commission to the European Council of 14–15 March 2013, <http://europa.eu/news/pdf/sg.2013-00286-01-04-eu.tra-00.pdf>, 24.01.2014.

- Pursuing differentiated, growth-friendly fiscal consolidation;
- Restoring normal lending to the economy;
- Promoting growth and competitiveness for today and tomorrow;
- Tackling unemployment and the social consequences of the crisis;
- Modernising public administration.

The deleveraging and adjustment process is inevitable and the main task of policy makers is to manage it and alleviate the associated economic and social consequences. Fiscal adjustment has to continue along the path of a differentiated growth-friendly consolidation strategy in view of the high debt levels and long-term challenges to public finances. However, as fiscal consolidation can have negative growth effects in the short term, it should be conducted in a growth-friendly manner, that is:

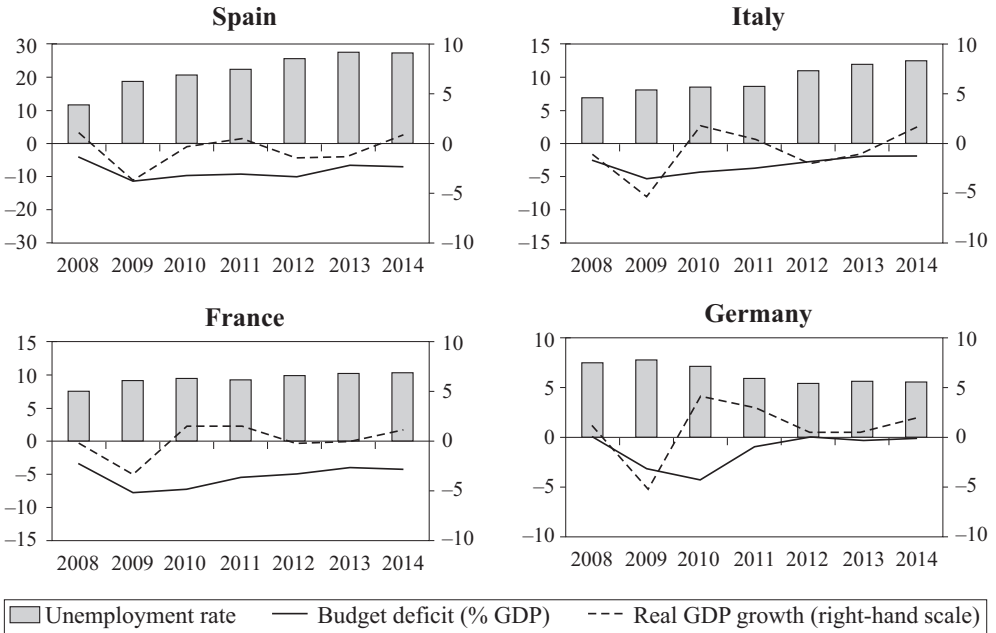
- the speed of consolidation has to be differentiated across countries according to their fiscal space, to strike the right balance between potential negative growth effects and the risks to debt sustainability. The Stability and Growth Pact and the central role of structural budget balances (Figure 4, Figure 5, Figure 6, Figure 7, Figure 8) therein offer the appropriate framework to guide the differentiated speed of adjustment (Figure 9);

**Figure 4. Trends in GDP, unemployment and budget deficits in selected Member States (1)**



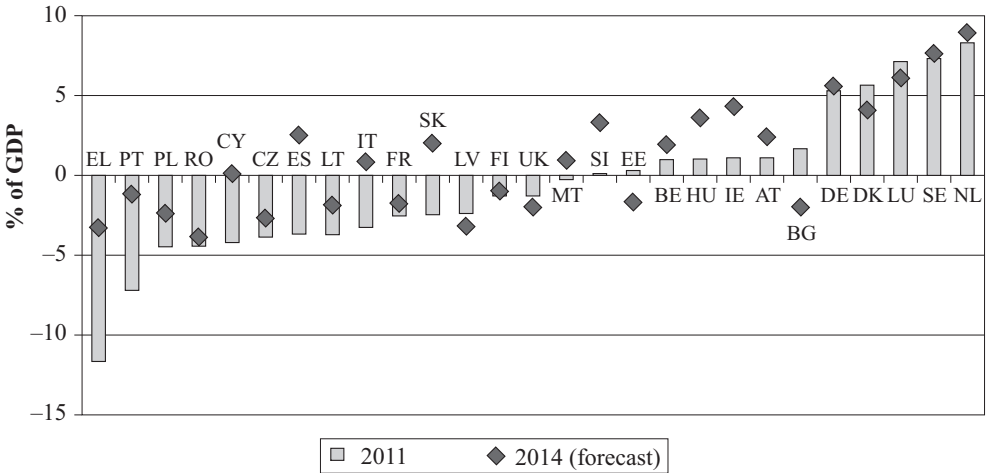
**Source:** Growth, competitiveness and jobs priorities for the European Semester 2013. Presentation of J. M. Barroso, *President of the European Commission to the European Council of 14–15 March 2013*, <http://europa.eu/news/pdf/sg.2013-00286-01-04-eu.tra-00.pdf>, 24.01.2014.

**Figure 5. Trends in GDP, unemployment and budget deficits in selected Member States (2)**



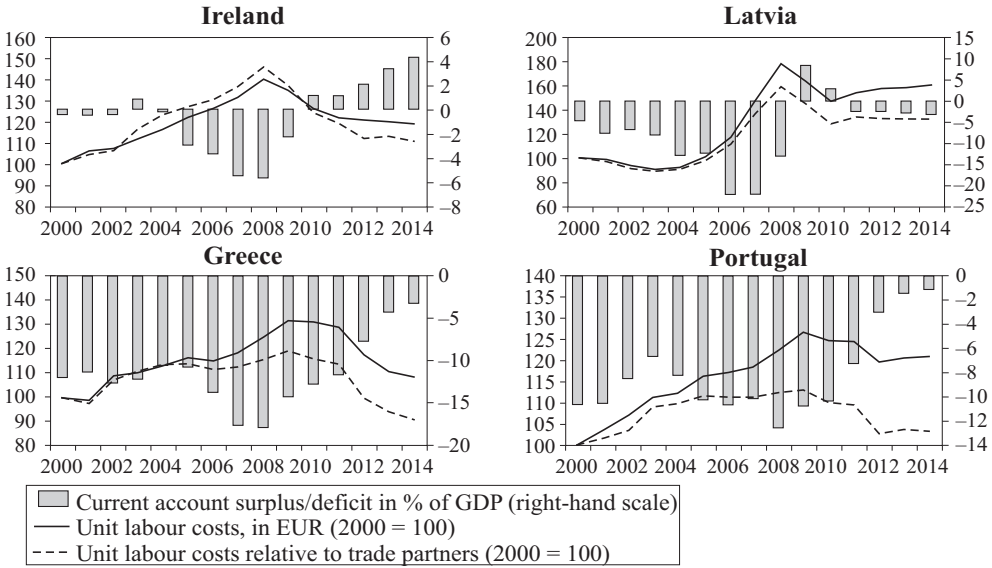
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**Figure 6. Current account balances (% of GDP)**



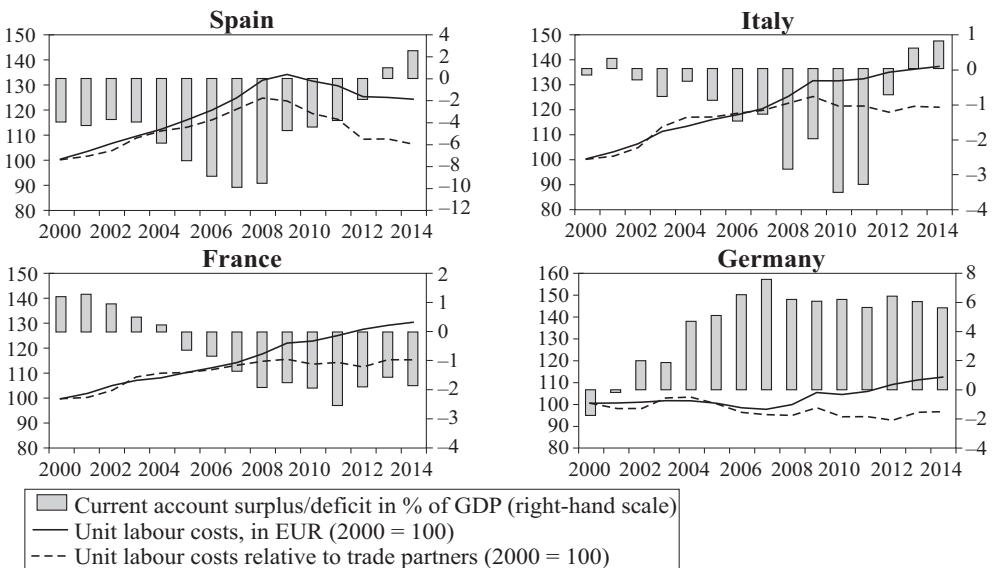
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**Figure 7. Trends in current account balances and unit labour costs in selected Member States (1)**



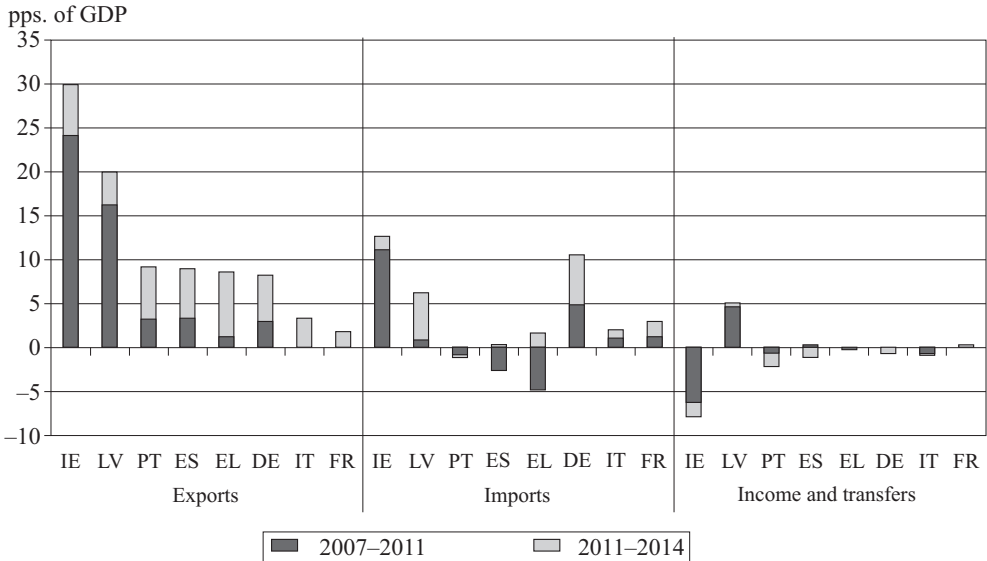
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**Figure 8. Trends in current account balances and unit labour costs in selected Member States (2)**



**Source:** Growth, competitiveness and jobs priorities for the European Semester 2013. Presentation of J. M. Barroso, *President of the European Commission to the European Council of 14–15 March 2013*, <http://europa.eu/news/pdf/sg.2013-00286-01-04-eu.tra-00.pdf>, 24.01.2014.

**Figure 9. Changes in the composition of current account adjustment**



**Source:** Growth, competitiveness and jobs priorities for the European Semester 2013. Presentation of J. M. Barroso, *President of the European Commission to the European Council of 14–15 March 2013*, <http://europa.eu/news/pdf/sg.2013-00286-01-04-eu.tra-00.pdf>, 24.01.2014.

Additionally, credibility of consolidation and its positive effects are enhanced if it is anchored in a credible medium-term fiscal framework and accompanied by reforms addressing the long-term sustainability issues stemming from an ageing population COM 750 final (2012).

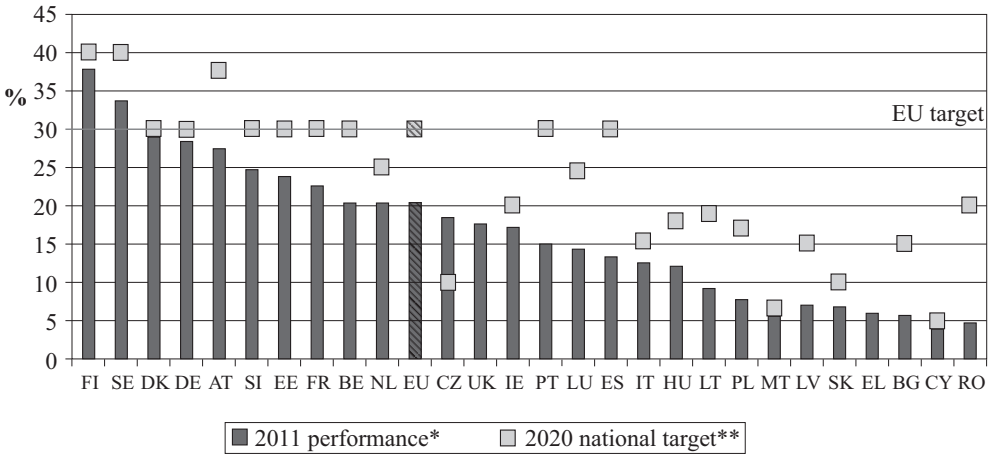
### Horizon 2020

Horizon 2020 is the financial instrument implementing the Innovation Union a Europe 2020 flagship initiative aimed at securing Europe’s global competitiveness. Running from 2014 to 2020 with a budget of just over €70 billion, the EU’s new programme for research and innovation is part of the drive to create new growth and jobs in Europe.

Horizon 2020 provides major simplification through a single set of rules. It will combine all research and innovation funding currently provided through the Framework Programmes for Research and Technical Development, the innovation related activities of the Competitiveness and Innovation Framework Programme (CIP) and the European Institute of Innovation and Technology (EIT).

- The proposed support for research and innovation under Horizon 2020 will:
- Strengthen the EU’s position in science with a dedicated budget of € 24 341 million. This will provide a boost to top-level research in Europe, including the very successful European Research Council (ERC).
  - Strengthen industrial leadership in innovation € 17 015 million. This includes major investment in key technologies, greater access to capital and support for SMEs.

Figure 10. R&D investments in the EU as a % of GDP



\* EL: 2007.

\*\* No targets set by EL and the UK. For CZ: w target (of 1%) is available only for the public sector. For IE: the target is 2.5% of GNP which is estimated to be equivalent to 2.0% of GDP. For LU: the target is between 2.30% and 2.60% (2.45% was assumed).

Source: Growth, competitiveness and jobs priorities for the European Semester 2013. Presentation of J. M. Barroso, President of the European Commission to the European Council of 14–15 March 2013, <http://europa.eu/news/pdf/sg.2013-00286-01-04-eu.tra-00.pdf>, 24.01.2014.

— Provide € 30 956 million to help address major concerns shared by all Europeans such as climate change, developing sustainable transport and mobility, making renewable energy more affordable, ensuring food safety and security, or coping with the challenge of an ageing population.

It must be emphasized that Horizon 2020 will tackle societal challenges by helping to bridge the gap between research and the market. Through a new strategy, a strategic and coherent approach to international cooperation will be ensured across Horizon 2020. Horizon 2020 will be complemented by further measures to complete and further develop the European Research Area by 2014. These measures will aim at breaking down barriers to create a genuine single market for knowledge, research and innovation.

It take into account some key parameters set out in the EU budget review: the need to focus on instruments with proven European added value, to develop a more results-driven approach, to leverage other public and private funding, and to design EU instruments that work together in a single strategic framework.

This Impact Assessment considers four policy options:

Business-as-usual (BAU): maintaining the current plurality of programmes for R&D and innovation: In this scenario, the three main existing EU sources of funding for research and innovation – FP7, the innovation-related part of the CIP, and the EIT – are simply carried forward into the next multiannual financial framework as separate instruments, and in their current formats.

Improved business-as-usual: loose integration and stand-alone simplification (BAU+): In this scenario, FP7, the innovation-related part of the CIP, and the EIT remain separate

instruments and retain their current formats but are put together under a 'common roof'; loose coordination mechanisms are established between them. The implementing modalities of each programme are simplified separately, but no single set of simplified rules, funding schemes, support services etc. applies across the three programmes.

Horizon 2020 – Establishing a single strategic framework for Research and Innovation: In this scenario, FP7, the innovation-related part of the CIP, and the EIT are fully integrated into a single unitary framework: Horizon 2020, The Framework Programme for Research and Innovation. The current separation between research and innovation activities is eliminated. Horizon 2020 sets out three strategic policy objectives: raising and spreading the levels of excellence in the research base; tackling major societal challenges; and maximising competitiveness impacts of research and innovation. Horizon 2020 is structured around three priorities which link directly to these aims. The selection of actions and instruments is driven by policy objectives and not by instruments. Horizon 2020 also integrates a major simplification and standardisation of funding schemes and implementing modalities across all areas.

Bring to an end EU level R&D financing and re-nationalise R&D and innovation policies: The renationalisation option consists of discontinuing EU research and innovation programmes and of spending those funds at Member State level. A discontinuation option, which is assessed to a lesser extent, consists of discontinuing EU research and innovation programmes and not spending those funds at Member State level (SEC 1428 final 2011).

It must be emphasised that Horizon 2020 maximises cost-effectiveness. On the cost side, its far-reaching integration, simplification and harmonisation will reduce costs for the Commission and for applicants. At the same time, the Horizon 2020 option maximises the benefits through a close integration of research, innovation and training. This will provide the best approach for ensuring that investments made at EU level in research projects are fully valorised into patents and new products, processes and services.

## Results

The research into the innovations in companies demonstrate that there is much more interaction and cooperation among the elements of the innovation system that occurs at the level of the region than the country. This results in the emphasis in recent years to research the potential and the regional innovation systems. In response to the need and assuming greater efficiency of the actions taken nearer to the entities, most regions that possess their own local authorities creates their own policy and proinnovation strategy.

Constructed advantage is both a means of understanding the noted metamorphosis in economic growth activity and a strategic policy perspective of practical use to business firms, associations, academics, and policy makers. In the Triple Helix model constructed advantages conceptualize as the surplus value of an overlay of relations among the three components of a knowledge-based growth: (1) the knowledge-producing sector (science), (2) the market, and (3) governance. Those places with research universities

witness a growing demand for knowledge transfer to industry and, through governance, to society.

It is important to underline that the Innovation Union is one of the seven flagship initiatives of the Europe 2020 strategy for a smart, sustainable and inclusive economy. An efficient innovation system introducing innovation and competitiveness of companies must have the proper linkages between science, industry and governance. Horizon 2020 is the financial instrument implementing the Innovation Union a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. Running from 2014 to 2020 with a budget of just over €70 billion, the EU's new programme for research and innovation is part of the drive to create new growth and jobs in Europe.

International cooperation is an important cross-cutting priority of Horizon 2020. In addition to Horizon 2020 being fully open to international participation, targeted actions with key partner countries and regions will focus on the EU's strategic priorities. Through a new strategy, a strategic and coherent approach to international cooperation is ensured across Horizon 2020.

Horizon 2020 maximises cost-effectiveness. On the cost side, its far-reaching integration, simplification and harmonisation reduce costs for the Commission and for applicants. At the same time, the Horizon 2020 option maximises the benefits through a close integration of research, innovation and training. This provides the best approach for ensuring that investments made at EU level. Structural reforms, which improve competitiveness, wage responsiveness and price flexibility are key to improving adjustment capabilities and to stimulating the transfer of resources from declining to growing sectors.

## Conclusion

In the conclusion it must be emphasised that under Horizon 2020, only those kinds of activities will be supported that have passed the European added value test. Under the proposal on the next Multi-annual Financial Framework (MFF), the funding for Horizon 2020 amounts to € 80 billion, which represents a 46 percent increase with respect to comparable funding under the MFF 2007–2013. The new system for the evaluation and monitoring of Horizon 2020 will be based on a comprehensive, well-timed and harmonised strategy, with a strong focus on throughput, output, results and impacts. Structural reforms, which improve competitiveness, wage responsiveness and price flexibility are key to improving adjustment capabilities and to stimulating the transfer of resources from declining to growing sectors.

It must be emphasized that structural reforms are necessary to facilitate adjustment and improve the framework conditions for European Union growth. Reforms promoting job creation, investment in innovation, skills and inclusive growth are necessary to tackle the risk of hysteresis and alleviate the negative impact of the crisis on social conditions. A fair distribution of the adjustment burden across society is important for sustained growth. Ultimately, however, a coherent policy mix encompassing both macro-financial and structural policies is indispensable for growth to resume. Hence a determined policy action on all these fronts is necessary to counter the negative dynamics and improve the economic situation in a sustainable manner.



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## Innowacje w strategii wzrostu gospodarczego Unii Europejskiej

### Streszczenie

Celem głównym artykułu jest przedstawienie roli innowacji w strategii wzrostu gospodarczego Unii Europejskiej. Zgodnie z nową teorią wzrostu będącą najważniejszą podstawą koncepcji systemu innowacyjnego, zasadniczym czynnikiem wzrostu gospodarczego jest endogeniczny postęp technologiczny. Do celów szczegółowych badania należały przedstawienie modelu systemu innowacyjnego, teoretycznej koncepcji systemu innowacyjnego i procesu innowacyjnego, korzyści strukturalnych powstających w regionie, modelu Potrójnej Spirali, Unii Innowacyjnej, strategii Europa 2020 oraz instrumentu finansowego Unii Innowacyjnej czyli Horyzontu 2020. Rozważane problemy były badane przy zastosowaniu metod jakościowej i ilościowej. Wykorzystano także metody dedukcji i indukcji oraz statystycznej prezentacji danych i prognozowania. Do najważniejszych rezultatów badań należy stwierdzenie, że w procesie innowacyjnym, także w Unii Europejskiej bardzo ważne są wzajemne powiązania między badaniami naukowymi, przedsiębiorstwami, czyli rynkiem i zarządzaniem na odpowiednich poziomach działalności gospodarczej. Występuje też pozytywna zależność między działalnością innowacyjną i efektywnością procesu innowacyjnego. Więcej wzajemnych interakcji i uwidacznia się przy tym na poziomie regionu niż na poziomie państwa. Nowe programy Europa 2020 i Unia Innowacyjna są niezwykle istotnymi czynnikami strategii wzrostu gospodarczego Unii Europejskiej.

**Słowa kluczowe:** postęp technologiczny, proces innowacyjny, korzyści strukturalne, model Potrójnej Spirali, Unia Innowacyjna, Horyzont 2020, Europa 2020, wzrost gospodarczy