Chapter 3

The 3 per cent Barcelona Target: A Critical Appraisal of the Failure of the Lisbon Strategy's Knowledge-based Economy and Society Project

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Abstract: Ten years after the unanimous approval of the Lisbon Strategy at a special meeting of the European Council on 23-24 March 2000 in Lisbon, it will be inevitable for the European Council, the European Commission and the majority of the EU member states to face with its fiasco and to account for the reasons of their fundamental policy, governance and economic failures in 2010. The recent turbulence of the global economy offers some excuses for the underperformance of the main objectives of the Lisbon Strategy in the essential social and economic domains, like job creation, economic growth, and environmental sustainability. Negative growth rates, macroeconomic and financial instability, the contraction of the internal and external markets of the European economy, drop in demand for capital investment, goods and services, sinking corporate revenues, depreciation of corporate assets, increasing private and public indebtedness, falling rate of employment, weakening social cohesion, widening social inequality, and so forth not only deprive the majority of the EU member states of fulfilling the main objectives of the Lisbon Strategy but also drive them into worse social and economic conditions in many policy domains than they were in 2000.

Keywords: Lisbon strategy, Innovation, R&D, Knowledge economy and society.

Nevertheless, the disappointing outcome cannot be exclusively ascribed to the recent global crisis because the political commitments of the majority of the EU member states to accomplish either the original or the subsequent and more focused objectives of the Lisbon Strategy were weak and sometimes entirely lacking even in the halcyon years of the present decade. The governments of the EU member states neither discussed critically the feasibility of the main objectives of the Lisbon Strategy, nor adhered faithfully to them. The objectives of the Lisbon Strategy were regularly and ritually agreed upon without expressing objections and disapprovals in Lisbon, Stockholm, Gothenburg, Barcelona, Lahti, and Brussels between 2000 and 2008. A few critical reports, like the *Sapir Report* (2003) and the *Kok Report* (2004), already called attention to the incoherencies of the economic and social objectives, the inappropriate institutional settings, the lack of political leadership and ownership of the whole project, and the underprovision of financial resources for the key areas of the economic and social development but their recommendations did not lead to the careful revision of – as the rapporteurs noticed – this overloaded agenda (Sapir Report 2003, 27., 79., 84-86.; Kok Report 2004, 6.). One of the most serious shortcomings in professional soundness, political and economic determination, appropriate governance structure and satisfactory financial involvement has affected the national and community-wide innovation, research and development policies from the outset. The attempts of reorganizing the EU budget in order to provide more incentives and financial means to increase research and development expenditures on community level were disapproved (Pisani-Ferry and Sapir 2006, 4.; Pelkmans and Casey 2004). Even though, the European Commission confidently emphasized in the *Investing in Research: An Action Plan for Europe* (2003) that: "All Member States, acceding and candidate countries agreed on the importance of increasing investment in research, and most indicated that they had already put in place policies and concrete measures to that effect, or were in the process of doing so. Many have also set national targets in line with the European 3% objective. For example, both France and Germany have adopted the 3% objective for themselves, and so has a future Member State, Slovenia. Momentum is thus building up" (European Commission 2003, 5.). The strong commitment of the EU member states as well as the European business enterprises to the 3 per cent Barcelona target has not materialized in the figures of science, technology and innovation statistics, yet.

Needless to emphasize, the lack of the solid political commitments and economic efforts of accomplishing the common policy aim in the fields of innovation, research and development entirely undermines the ultimate goal of the Lisbon Strategy, namely, as it was proclaimed in the Presidency Conclusions of the Lisbon European Council in 2000, "to become the most competitive and dynamic knowledge-based economy in the world" (European Council 2000, § 5.). Therefore, the majority of the EU member states' attitude toward the objectives of the Lisbon Strategy characterized by the political, economic, institutional inertia and the art of rhetoric in the fields of innovation, research and development has anticipated the poor outcome of the whole project from the very beginning. Today, the knowledge-based economy and society, as determined in Lisbon, seem to be rather nice to have agenda for the majority of the EU member states than a vital precondition for the future economic and social development of their countries and the European Union.

As a matter of fact, the Lisbon Strategy could not bring about any noticeable change in the European innovation landscape, indeed. While, the most innovative countries, like Sweden and Finland, have managed to keep and advance their distinguished position, and few countries, like Austria, Denmark, Portugal and Estonia, have made considerable efforts to improve their overall research and development intensity, the mediocre and feeble positions of the majority of the EU member states have remained unchanged in the global ranking of innovation performance since 2000. In 2008 the gross domestic research and development expenditure of the EU-15 was exactly as low as it had been in 2000 that is 1.91 per cent in terms of GDP. The research and development intensity was reduced in France, the United Kingdom, Belgium, the Netherlands, Greece, Poland, Slovakia and Bulgaria during the same period. Compared to the OECD average of 2.276 per cent of research and development expenditure in terms of GDP, the EU-15 is also outperformed by a significant margin in 2008 because of the higher research and development intensity of the most dynamic global competitors. In addition, the research and development intensity of a few non-OECD economies, like Israel's, Singapore's, and Taiwan's, is substantially above the OECD average. In addition, the particularly high rate of economic growth was not matched up to comparable high increase in research and development intensity in the new EU member states which have shown very impressive economic performance in the previous decade. Starting from a very low base of innovation performance, the figures of public and private research and development intensity have shown certain improvement in some of the new EU member states, like Slovenia, the Czech Republic and Estonia, since their accession, but due to the modest size of their annual GDP and the wide

gap of innovation, research and development intensity between the EU-15 and the EU-10 it was not enough to make any statistically recognizable impact on the stalled trends of the EU-27.

Recently, the European Commission reasserts the outstanding importance of the increase of public and private research and development expenditures and recommends the countercyclical investment strategy in time of economic crisis in its *European Economic Recovery Plan* issued on 26 November 2008 (European Commission 2008.; IMF 2009, 113-123.). Nevertheless, endogenous growth theory firmly demonstrates that the optimal path for innovation is countercyclical for the countries where the firms face tight credit constraints due to the financial crisis. However, there is no conclusive view in the economic literature about the genuine public and corporate research and development strategy which would be valid for all of the countries and of the enterprises in time of economic crisis: the question is whether the governments and the business enterprises should choose a procyclical or a countercyclical path of investment strategy. In theory, countercyclical budgeting and macroeconomic policy would be desirable to bring under the control of booms and busts in the economy and to undertake countercyclical fiscal measures in the fields of innovation, research and development, especially, in time of economic crisis in order to keep up and reallocate human and economic resources for the future development (Bradley et al. 2009; Baumol and Blinder, 2009, 345-349.) Therefore, it is not so difficult to give a definite answer to this question if we are aware of the fact that discounting the future economic and social development of a country or the long-term economic prospect of a corporation is not a particularly creative idea. To economize on the investment costs of producing new knowledge for the future is not only a shortsighted business and public policy, but also due mainly to the failure of reallocating limited resources to the most productive uses and of taking advantage of lower opportunity costs of diverting more resources from production to research and development activities in time of economic downturn, but it exhibits an unfair distribution of human and economic resources from the point of view of inter- as well as intra-generational equity. For the above-mentioned reasons, the Schumpeterian growth theory is all about the countercyclical investment strategy of the countries and the corporations in innovation, research and development; it provides the very foundation of dynamic economic system. Some current economic surveys conjecture an optimistic outlook concerning the behavior of the most innovative, leading-edge enterprises; the majority of them rather endeavor to increase or at least sustain their research and development activities in order to strengthen their competitive advantages in the forthcoming upturn than to hibernate or take some defensive strategy through the recent downturn (Frey and

Callahan 2008; Leadbeater and Meadway 2008; Innobarometer 2009). In opposition to these optimistic views on the behavior of the large corporations, the recent quarterly reports of the publicly traded corporations in US stock markets signal a procyclical trend. The current survey of 2097 large publicly traded corporations shows that the corporate research and development expenditures are significantly reduced in the first quarters of 2009. The decline of corporate research and development spending is especially apparent in semiconductor industry, information and communication technologies and services which are generally grouped into high and medium high research and development intensive sectors (OECD 2009, 22-23.). The *Innobarometer 2009 Analytical Report* interviewed 5,034 innovative enterprises across Europe also confirms these declining trends: the recent economic crisis forced more European enterprises (28.3 per cent) to reduce their research and development expenditures than to increase them (11.5 per cent); meanwhile the 50.7 per cent of the enterprises expected to maintain the total amount of their innovation expenditures (Innobarometer 2009 101-102.). The latest statistical figures also show that the relative share of the research and development funds of the business enterprises in terms of the total research and development spending and the venture capital investment were stagnant and somewhat declining in most EU member states in 2009. While, it is quite obvious that the countercyclical behavior of the firms and the governments in the fields of innovation, research and development would be beneficial due to its long-term positive impact on corporate performance as well as the economic and social development of the countries; it is particularly difficult to implement this countercyclical strategy in time of tight credit and budgetary constraints (Voigt and Castello 2009, 19-24.).

To sum up, the theoretical arguments for the long-term advantages of countercyclical investment strategy in innovation, research and development are sound and quite convincing. In time of economic crisis, as Philippe Aghion states, "…a natural prediction is that the lower the level of financial development, that is, the tighter the credit constraints faced by firms, the more growth-enhancing such countercyclical policies should be" (Aghion 2006, 17.). However, the empirical evidence attests that neither the majority of the EU member states, nor the European enterprises follow the Schumpeterian growth model in their research and development investment strategy for the future development. The Schumpeterian model of strategic adaptation under recession appears to be the exception rather than the rule among the European business enterprises and the EU member states. The behavior of the majority of the EU member states as well as the European business enterprises is patently procyclical, that is to say, they usually invest more in time of economic upturn, and less in time of economic downturn in innovation, research

and development which will presumably widen or at most keep up the innovation gap between them and their most innovative global competitors if the latter choose countercyclical investment strategy. A recently published IMF study also demonstrates that the procyclicality of government expenditure in the new EU member states, especially, Hungary, Romania, Lithuania and Latvia between 2003 and 2007 reduced their ability and fiscal space for countercyclical fiscal policy to get out of the downturn (Rahman 2010). After all, the countercyclical behavior seems to be the privilege of the most innovative enterprises as well as the most innovative countries in order to create and ensure their position in new markets and generate competitive advantage for the forthcoming upturn. In the last decade, only the most innovative EU member states, Sweden, Finland and Denmark could produce considerable amount of budgetary surplus and keep their public debt ratios quite low which provide financial sources for maneuvering in time of economic depression.

Therefore, regarding the stalled public and private research and development expenditures of the majority of the EU-27 between 2000 and 2008, it is hard to figure out the countercyclical behaviors of the European business enterprises and the governments in order to spur economic recovery and accommodate in this way to the forthcoming upturn. In most countries and most European corporations, the public and private budgets seem to be kept too tight to realize any significant change in innovation, research and development policy for the future development. Although a profound economic transformation toward knowledge-driven and high-technology industries and structural reforms in different policy domains are even more compelling in time of recession. Up to now, the expanded roles of the governments of the EU member states have been rather manifested in short-term countercyclical economic measures to mitigate the direct and immediate consequences of the global economic crisis, particularly, in the banking sector and automotive industry than in long-term fiscal projections on behalf of the future growth and prosperity. The distribution of public spending in many EU member states has displayed long-term rigidity and the lack of willingness to bring about dynamic change in the composition of budget and macroeconomic policy in order to give an impulse to innovation, research and development before and after Lisbon. In spite of the recommendations of the European Commission, the governments in a few EU member states have already announced the intention of cutting down on the public research and development expenditures and especially higher education spending for the 2010, 2011 and the following budgetary years, therefore, it is not early to predict even on the basis of scattered data, uncertain political projects, and newspaper articles that the majority of the EU governments under the pressure of enormous budget deficit, public and private debt burdens, and zero or negative

economic growth are forced to follow procyclical investment strategy in this policy domain (Theil 2008; Kitching et al. 2009; Le Billon 2009; Schaeffer, 2009; Les dépenses de l'Etat, 2010; Solletty 2010). For sure, public and private innovation, research and development expenditures will not remain intact after the procyclical retrenchment measures of the governments of the EU member states. Procyclical innovation, research and development policy will result that convergence in terms of income per capita between the high and the low research and development intensive EU member states, especially, the new EU member states, will be presumably impeded even after the economic recovery begins. The economic recovery will bring about further concentration of research and development activities across Europe and increase regional differences on behalf of the most innovative countries. In the long run, the lack of the adaptation of innovation-enhancing strategy, low research and development intensity, and the recent cut down on the investment costs of innovation, research and development and higher education budget condemn the economy of these countries to a nonconvergence trap. The recent course of government actions raises doubts about the future growth potential of the new EU member states. Without the fundamental changes in the distribution of economic resources, economic structure, policy objectives, institutions and education system the new EU member states will not be able to reduce their distance to the global innovation frontier in the coming years (Acemoglu, Aghion and Zilibotti 2006, 37-74.; Aghion and Howitt 2006, 269-314.).

The European Commission also outlines a particularized innovation strategy of the future for the governments of the EU member states as well as the European corporations. In *A European Economic Recovery Plan* (2008), the European Commission opts for the reallocation of public and private research and development expenditures, above all, to the energy, automotive, construction, and manufacturing sectors which are supposed to bring about a major structural transformation towards the low carbon or green economy in the near future. Phrasing the Schumpeterian fear, the European Commission undertakes to chart the uncharted seas of technological possibilities for the future development (Schumpeter 1950, 118.). In the above-mentioned and other recent official documents of the European Union, there are fewer talks about knowledge-based economy, and generally the social preconditions of the production, use, and distribution of knowledge in society; the notions of the low carbon economy or green economy seems to be a substitute for these former catchwords as if those would have fallen out of fashion. In this way, the dynamic transformation toward a green economy is rather technological than social process directed by committees and experts. Even though, making a breakthrough in greening the European economy mainly relies on the change of a

way of life on a scale which presumes the basic alteration of long-term social and economic objectives.[1] However, the Lisbon Strategy does not imply this profound social alteration.

In this essay, I review the origin of the Barcelona target – the 3 per cent of public and private expenditures on research and development in terms of GDP by 2010 – and examine its feasibility, social and economic rationale aiming to mobilize the political and corporate actors to its fulfillment. I also endeavor to measure, at least in retrospect, what would have been a proper percentage and annual increase of public and private research and development expenditures in terms of GDP in order to bridge the gap between the EU member states and their most dynamic global political and economic partners as well as the European corporations and their global competitors by 2010. Finally, I would like to raise a broader philosophical question concerning the reasonableness of this voluntaristic political aspiration of the Lisbon Strategy in the fields of innovation, research and development, namely, surpassing the innovation frontiers of the most dynamic global political and economic partners of the European Union, especially, the United States, Japan and South Korea by means of the Europeanization of the production, use, and dissemination of knowledge and information.

Lisbon Strategy and the Origin of the 3 per cent Barcelona Target

Two years after Lisbon, the Presidency Conclusions of the Barcelona European Council of 15 and 16 March 2002 set an exact figure concerning public and private expenditures on research and development in terms of GDP for the governments of the EU member states as well as the European corporations. According to the Presidency Conclusions in Barcelona, "…in order to close the gap between the EU and its major competitors, there must be a significant boost of the overall R&D and innovation effort in the Union, with a particular emphasis on frontier technologies. The European Council therefore […] agrees that overall spending on R&D and innovation in the Union should be increased with the aim of approaching 3% of GDP by 2010. Two-thirds of this new investment should come from the private sector" (European Council 2002, § 47.). All official documents and communications, the National Reform Programs (earlier, National Action Plans) issued by the European Commission and the EU member states have considered this 3 per cent target as a

1 As Lars Josefsson, the CEO of Vattenfall, put it: the change in the use of clean and renewable energy sources "…is not a question of money or technology. It requires a redesign of society." Quoted by Mark Fischetti (Fischetti 2009).

hard and fast rule in an old manner of centrally planned economy since 2002.

Beyond the fact that the aim of attaining the 3 per cent of overall public and private research and development expenditures in terms of GDP by 2010 offers an appealing perspective for the European economic and social development, I could not find any meticulous social and economic studies or policy and support papers among the official documents which would have provided comprehensive macro- and micro-economic analyses, economic, political and social justifications to pinpoint the 3 per cent Barcelona target by 2010 in connection to the forecasted growth rate and the innovative potentials of the European economy, or the present and future challenges of the most dynamic global competitors. With the exception of few dissenting voices in the United Kingdom and Italy, the majority of the EU member states complied with the 3 per cent Barcelona target as the executable end of the Lisbon Strategy without argument (Presidenza del Consiglio dei Ministri 2005, 6.; HM Treasury 2006, 26.). For certain, policy and support papers, social and economic analyses dealing with the reasons of the decline in the innovation performance of the majority of the EU member states since the end of the 1980's, the strengths and weaknesses of the European knowledge production, the innovative potentials of the high, medium and low research intensive sectors of the European economy, the geographical dispersion, research outputs and the nodality of the European private and public research centers and universities etc. were not listed among the attached documents submitted prior to the Lisbon or the Barcelona European Council.[2]

Six months later of the Presidency Conclusions of the Barcelona European Council of 15 and 16 March 2002 the European Commission issued a document – *More Research for Europe: Towards 3% of GDP* – which endeavored to give a general overview of the European innovation landscape as well as economic, social, and political justifications for the importance of effective and integrated research and innovation policy in Europe. However, this document and its attachment rather emphasized the desirability of the 3 per cent Barcelona target than ana-

2 On the basis of Article 4.3 § 2 of Regulation Nr 1049/2001, the DG Research-R6 Unit of the European Commission denied my request to access to the documents which might (or not) have established the economic and social feasibility of the 3 per cent Barcelona target quoting in its letter written on 13 November 2009 that the disclosure of these documents "would seriously undermine the institution's decision-making process". Besides the fact that its refusal is unsubstantiated since the decision making procedure in this particular case terminated more than seven years ago, needless to emphasize, my essay does not intend to do that. In its letter written on 4 December 2009, the DG Research-R6 Unit of the European Commission further indicated that no public interest exists to disclose the requested documents. On account of the documents which are available to the public I have come to the conclusion that the political statement concerning the 3 per cent target of GDP in Barcelona was in lack of a careful and comprehensive economic consideration in 2002.

lyzed and substantiated its feasibility. While, the argumentation of this document derives from the main thesis of endogenous growth theory which lays emphasis on knowledge production, knowledge spillovers, quality-improving innovations, human capital formation and growth-enhancing institutions as the prime movers of economic development, no attempt was made to calculate the actual magnitude of social and economic deficits, regional disunity, and sectoral under-, or overinvestment in these domains. Briefly, differences among the EU member states, for instance, the size of low, medium and high research and development intensive sectors in the economy, the availability of human resources, actual research and development intensity etc., which would have required quite various research and development policies, were left out of consideration. The EU Scientific and Technical Research Committee (CREST) greeted the Commission Communication as the necessary step forward in order to tackle the widening innovation gap between the European Union and its global competitors in its 2003 Opinion; but oddly enough, its involvement in the preparation of the Barcelona decision is not documented.

It is quite obvious that high research and development expenditures generally have the long-term positive effects on the economy and society but the authors of *More Research for Europe: Towards 3% of GDP* (2002) failed to give details of the key problem of the European economy, namely, how to handle the long-term stagnant private research and development expenditures which have hampered the European corporations as well as the EU member states to keep pace with the development of their global competitors in most of the business sectors, and many research and development areas for a long time. Before everything else, the corporate underinvestment in innovation, research and development has been a general and lasting phenomenon in most of the business sectors of the European economy at least since the end of the 1980's which has caused about € 55-93 billion yearly private investment gap between the European and the American corporations in this decade.[3] What is more, the private investment gap between the European and the American corporations has been widening since 2002. (So, has the public investment gap between the European Union and the United States since 2000.) Although, public research and development expenditures in most of the EU member states also lag behind of the most innovative global competitors', the gap is not so wide as in the case of private research and development investments. In short,

3 The total research and development investment gap between the European Union and the United States has been widened from € 73.4 billion to € 98.5 billion between 2000 and 2008. The European Commission reported in its communication in 4 June 2003 that "[t]he gap in research investment between the European Union and the United States is already in excess of € 120 billion per year…". (European Commission 2003, 4-5.) Nevertheless, the actual figures of the Eurostat and the OECD.Stat do not support the European Commission's rude estimation.

the improvement of public research and development spending could have been achieved within a reasonable time by means of shifting focus on budgetary priorities to provide funds for the production of new knowledge advocated unanimously by the European Council and the EU member states. In spite of this common objective, public research and development spending has also been stagnant or even declining, especially, in the largest EU member states, like in Germany, France, Italy and the United Kingdom since 2000.

In this respect, the authors of the *More Research for Europe: Towards 3% of GDP* (2002) mainly centered on the urgent need of the improvement of the community-wide legal and institutional framework as well as the changes in the priorities of public policy which is supposed to stimulate the European corporations to increase their research and development intensity. This may be a promising proposal; however, the fragmented institutional and legal structure in Europe does not seem to prevent the most innovative European corporations to keep pace with or even to surpass their global competitors. Besides the institutional, systemic and market failures – whether the lack of markets and market incentives prevent many business enterprises to innovate – were not scrutinized in this document which may justify the increase of public financial incentives and direct fiscal measures on behalf of the European corporations.

Due to the lack of the precise enumeration of the preparatory materials for political decision making in this policy domain, I am compelled to suppose that the drafters of the Presidency Conclusions of the Barcelona European Council simply defined the 3 per cent target by 2010 in the context of the research and development expenditures of the most innovative countries worldwide, especially, the United States, Japan and South Korea.[4]

In any case, the 3 per cent of public and private research and development expenditures in terms of GDP would not be sufficient to declare in 2010 that the European Union is the most competitive and dynamic knowledge-based economy in the world unless the research and development performance of the most innovative global competitors remains stagnant or even decline in the coming years. The Lisbon strategy simply disregarded the fact that there are quite a few countries among the global competitors like South Korea, Taiwan, and Singapore which were close to approach the 3 per cent research and development expenditures during the first decade of 2000, and they have had good opportunity to reach and surpass it by

4 Because the feasibility of the 3 per cent Barcelona target was not scrutinized before its announcement, João Caraça assumed that this 3 per cent Barcelona target is a part of the old European project originating from the famous prospective report of the French Commissariat général du Plan – *Réflexions pour 1985* – published in 1964 (Groupe 1985, 1964, 20., 121.; Caraça 2007) .

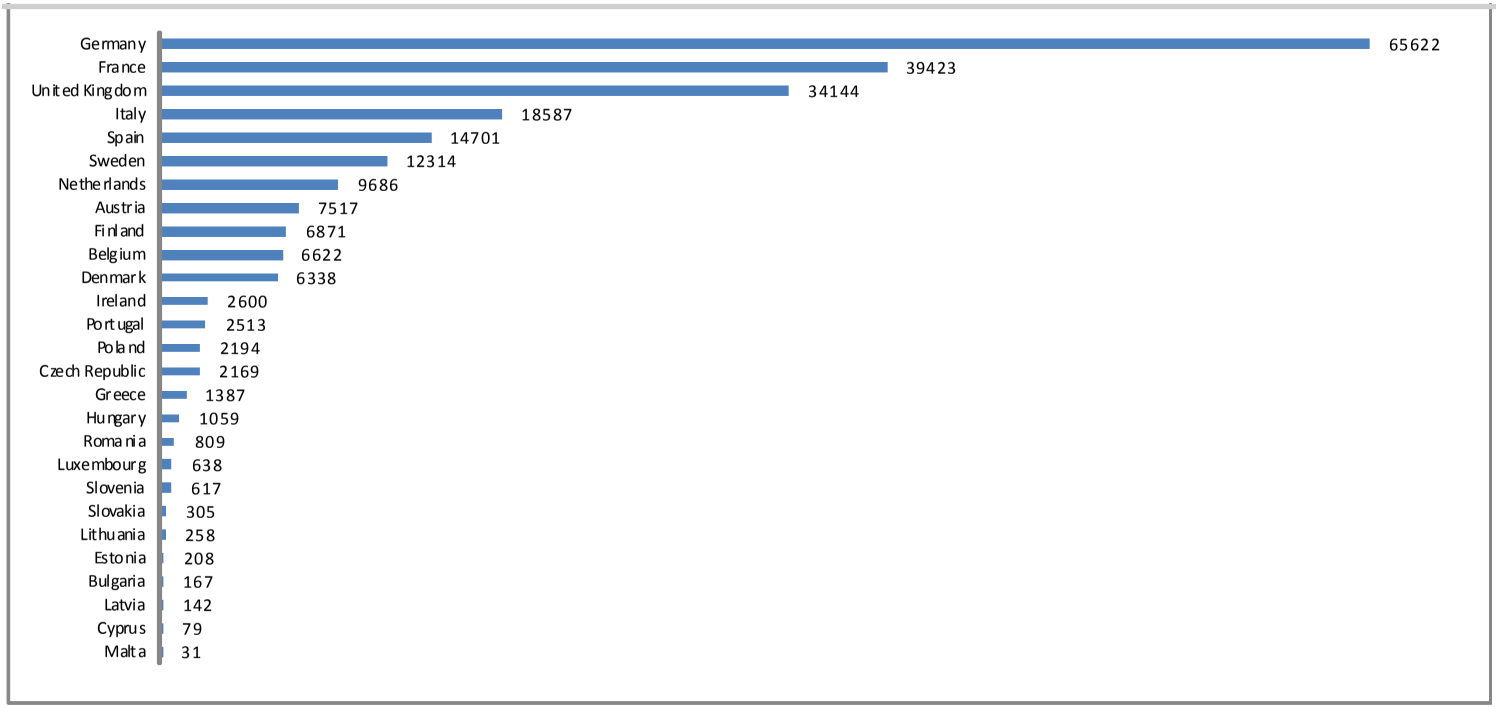
2010. For instance, South Korea's gross domestic expenditure on research and development has already exceeded 3 per cent of GDP in 2006, and it aims at increasing its public and private research and development expenditures to 5 per cent of GDP by 2012. Israel also plans to maintain 5 per cent research and development expenditure in terms of GDP for the coming years (Israel 2028, 132.). In addition, China more than doubled its research and development expenditures from 0.6 per cent to 1.44 per cent of GDP from 1995 to 2007. The Chinese government intends to increase research and development intensity to 2 per cent of GDP by 2010 which means that China will catch up with and outmatch the EU-27 as well as the EU-15 by the end of the present decade if the governments of the EU member states and the European business community fail to take a more knowledge-driven growth path in the near future (OECD 2008, 111.; Minder 2005; Laitner 2007). Be that as it may, long-term economic forecasts and analyses have not indicated the probability of the long-term stagnant or even declining research and development performance of the global competitors of the European Union, yet. Therefore, it would have been more pragmatic to announce that the European Union makes all efforts to catch up with the research and development intensity of the most innovative countries, like Israel, Sweden, Finland, Japan, South Korea, Iceland, the United States, Switzerland, Taiwan and Singapore. For sure, if the recent trends continue the European Union loses its position to China and the most dynamic Asian competitors in the global innovation ranking by the beginning of this decade.

Nevertheless, the Lisbon and Barcelona Presidency Conclusions in 2000 and 2002 accentuated somewhat different aims for the future prospects of innovation, research and development of the European Union. While, the Lisbon Presidency Conclusions declared that the objective of the European Union is to surpass the innovation frontiers of its global competitors and to obtain the leading position in the global ranking of innovation performance; two years later the Barcelona Presidency Conclusions merely communicated that the EU member states intend to close the gap between the European Union and its most innovative global competitors. Needless to say, the latter political aspiration certainly appears to be less ambitious and less unrealistic than the former. Although making nuanced distinctions between the two political statements of the Lisbon and Barcelona Presidency Conclusions sounds quite a bit pedantic regarding the decennial verbalism and inaction of fulfilling the primary objectives of the Lisbon Strategy, that is to say, "to become the most competitive and dynamic knowledge-based economy in the world". As a matter of fact, neither the gap will close between the European Union and the most innovative countries, nor the European Union manage to obtain the leading position in the global ranking of innovation performance by 2010. Besides

the most innovative EU member states like Sweden and Finland which managed to protect and advance their distinguished positions in the global innovation ranking, the European Union could not move closer to the global innovation frontier since 2000. The impressive performance of the most innovative small EU member states does little to compensate for the weak commitment of the largest EU member states and the long-term underinvestment in research and development across the European Union as a whole. In the last ten years, the innovation gap between the European Union and the most innovative global competitors has been widened, indeed.

A year after the Barcelona European Council, the European Commission Directorate-General for Research published the *Third European Report on Science & Technology Indicators* (2003), in which the rapporteurs gave a comprehensive survey of the European innovation landscape and forecasted potential outcomes for the evolution of knowledge-driven economic growth of the European Union, the United States and Japan for the period of 2000-2010. While, the rapporteurs affirmed the outstanding importance of the objectives of the Lisbon and Barcelona Presidency Conclusions concerning the creation of a knowledge-based economy and society, they also casted serious doubt on the achievability of the 3 per cent Barcelona target by 2010 mainly due to the political, economic, institutional and organizational inertia of most of the EU member states and of the European business enterprises in the implementation of the Lisbon Strategy. Given that most of the EU member states and the European business enterprises followed procyclical investment strategy after the bursting of the internet bubble, the public as well as the private research and development expenditures have declined since 2000 in many key sectors of the European economy. According to the rapporteurs' prediction, if substantial efforts and profound reorientation of public and private research and development policy do not take place in the following years, the research and development expenditure of the European Union is expected to be at most 2.2-2.3 per cent in terms of GDP in 2010. Even in the case of the best possible outcome outlined by the rapporteurs, the innovation gap between the European Union, the United States and Japan was anticipated to be widening by 2010. It turned out later that this prediction for the future research and development intensity of the EU member states and the European business enterprises appears to be rather optimistic, since the 2010 figure is 2 per cent in terms of GDP (European Commission 2003a, 45-47., 189., 192.). However, this modest increase is quite deceptive with regard to the fact that most EU member states struggled for keeping up the level of their 2007 and 2008 GDP in 2010.

Graph 1. Total R&D Expenditure of the EU Member States in Millions of Euro in 2008



Source: Calculations are Based on the Eurostat and the OECD Statistical Database

http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/introduction
http://www.oecd-ilibrary.org/science-and-technology/data/oecd-science-technology-and-r-d-statistics_strd-data-en
(last accessed on 26 February 2012)

Besides the long-term stalled trend of public and private research and development intensity, the rapporteurs pointed out one of the most serious consequences which makes the fulfillment of the main objectives of the Lisbon Strategy by 2010 somewhat unrealistic. Namely, an additional 835 000 researchers – about 80 000 young qualified researchers per year – in the fields of mathematics, science and technology are badly needed for higher education, government and, especially, business sectors in Europe by 2010 in order to catch up with the number of researchers in the United States and Japan. However, the European Universities and Research Centers produce not more than 40 000 doctoral graduates per year in these fields (Eurostat Statistical Yearbook 2008, 68.).[5] Perhaps one of the most perplexing phenomena of the European economic and social development concerning the aspiration of creating knowledge-based economy and society is that while, the number of graduate and doctoral students in the fields of mathematics, science and technology is almost twice as much than in the United States and Japan, far less young qualified researchers are engaged in innovation, research and development activities in Europe, particularly, in the business sector. In brief, the most qualified human resources as the most important asset of knowledge-based economy and society are vastly underutilized in most of the EU member states. The majority of the EU member states will not be able to increase the number of the most qualified human resources in research sector under the recent circumstance of stringent public and private spending, due to the fact that the largest part of the research and development expenditures consists of the wage costs paid for the researchers and the research personnel (Curtis 2009; Shepherd 2010, 4.; Jha and Sample 2010). For this reason, lower research and development expenditure is corollary of the lower rate of employment of most qualified human resources in research activities per 1 000 labor force and of lower capital intensity of the research and development departments of the European enterprises, universities and research centers in comparison with the United States and Japan. The modest demand for the young qualified researchers and the lack of competitive remuneration compel the significant part of the graduates and the doctoral students in mathematics, science and technology to find employment rather in public administration, banking, finance and insurance sector instead of contributing to the adoption of new innovation and frontier technologies, or to seek employment in research sector and higher education abroad. As the rapporteurs concluded, "Europe has for many years been, and continues to be, a wellspring from which countries such as the US, and to a lesser extent Aus-

5 Jean-Paul Betbèze estimated that 300 000 – 500 000 additional researchers are needed in Europe to achieve the 3 per cent Barcelona target (Betbèze 2005, 193.). Jerry Sheehan and Andrew Wyckoff calculated that the additional number of researchers needed would be almost 600 000 by 2010 (Sheehan and Wyckoff 2003, 27-28.)

tralia and Canada, have been drawing personnel with S&T skills" (OECD 2005, 168-170., 209-210; European Commission 2003a, 222.).

The European Commission in the *Investing in Research: An Action Plan for Europe* (2003) proclaimed that the EU member states and the candidate countries, the representatives of the large European corporations, small and medium-size enterprises and other stakeholders participated in the extensive political consultations on the objectives of the Presidency Conclusions of the Lisbon and Barcelona European Council unanimously supported the three per cent target by 2010. In spite of the political announcement of the European Commission, this overwhelming political support of the different stakeholders did not turn into action which would have required sustained efforts in the subsequent years. The EU member states and the European business enterprises should have at least tripled the annual growth rate of their research and development expenditures to meet the Barcelona target. The statistical figures relating to science, technology and innovation indicators were rather dispiriting: the public as well as the private research and development expenditures have declined further in the European Union between 2000 and 2006. The politicians of the European Union and the majority of the EU member states always articulate their high devotion to the Lisbon Strategy while they act contrary to its basic objectives in the domains of innovation, research and development. Surprisingly, the obvious policy blunder and the unwillingness of the majority of the governments of the EU member states and the European business enterprise to rearrange their budgetary priorities and allocate more resources in innovation, research and development activities did not seem to undermine the confidence of the European Commission and other political institutions in the achievability of the objectives of the Lisbon Strategy.

In order to substantiate the attainability of the 3 per cent Barcelona target, the European Commission quoted the main findings of the macroeconomic study made by the Laboratoire ERASME concerning the impacts of the knowledge-based development on the European economy and society. However, the study of the Laboratoire ERASME does not deal with the innovative potentials of the European economy and the individual countries relied on the profound analysis of the economic and social reality, the causes and consequences of the decennial stagnant trend of research and development intensities, the regional differences among the EU member states and so forth; it mainly conjectures the long-term macroeconomic results of the fulfillment of the 3 per cent Barcelona target and describes its prospective consequences in terms of the main economic indicators like the growth of GDP, total factor productivity, employment, consumption, external and internal trades, budget balance etc. by 2030. The study of the Laboratoire ERASME simply

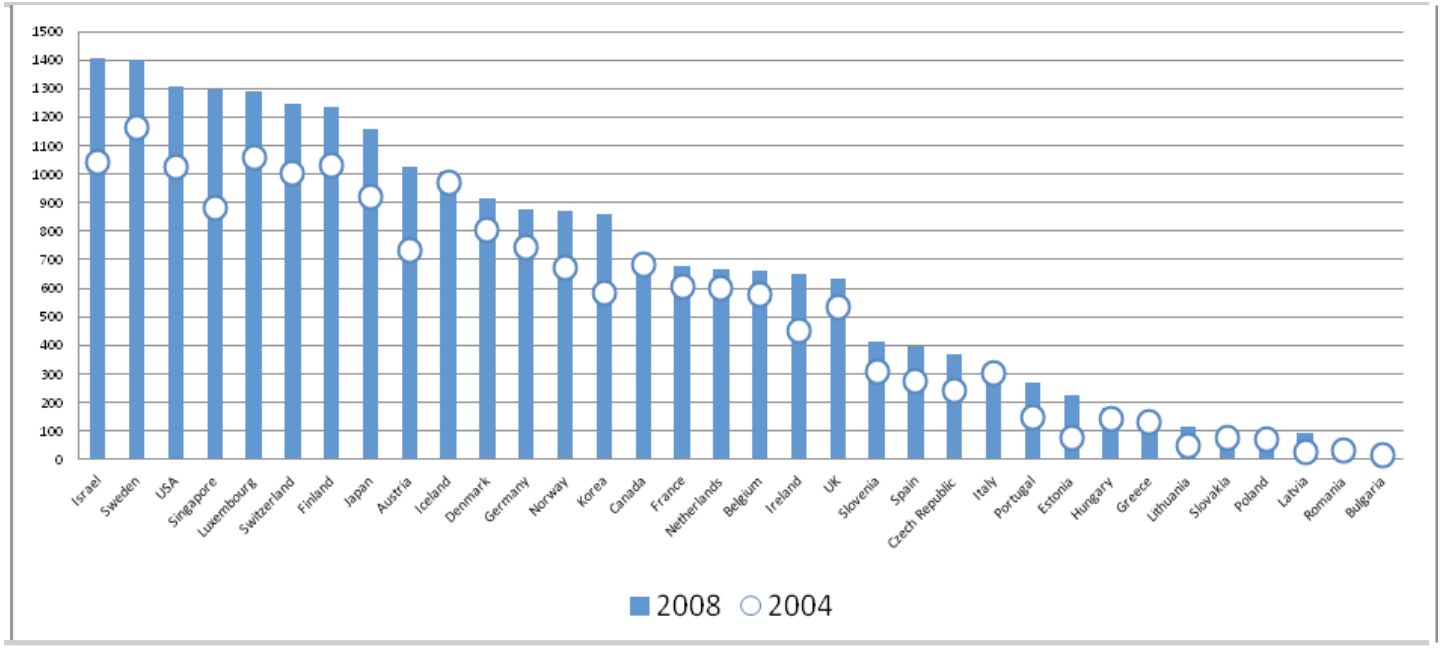
presupposes without further argument that all of the EU member states live up to the 3 per cent Barcelona target by 2010 and takes it as a starting point of quantifying the long-term economic and social returns to the higher research and development intensities of the EU member states (Brécard et al. 2006, 910-924.). In this way, the study of the Laboratoire ERASME describes the ex post world based on the above-mentioned presupposition in order to provide justification for the Lisbon Strategy but it does not ponder on what kinds of systematic, structural and regulatory changes must be done on industry, national and community levels to meet its objectives.

This presupposition led the authors to draw many untenable and doubtful conclusions for the future of the European economy due to the fact that those were not inferred from the innovative potentials, the use and availability of qualified human resources, the industrial structures, the actual research and development expenditures and concrete policy measures of the individual member states but from political declarations. It is a particularly perplexing assumption of the authors in regard to the recent financial crisis, enormous budget deficit, unsustainable fiscal expansions, public and private indebtedness, and decennial inaction in the domain of innovation, research and development that they expect the Southern European member states to confer the greatest benefit of the fulfillment of the Lisbon Strategy in terms of growth, employment, total factor productivity, budget balance and so forth. The authors indicated that because the less research and development intensive countries are required to boost their research and development intensities to the greatest degree for the purpose of meeting the 3 per cent Barcelona target, their efforts will bring about the deepest economic transformation towards the knowledge-based economy. This assumption, to wit, the low research and development intensive or hitherto laggard countries are in more advantageous position than the innovative countries due to the faster catch-up process and the high rates of convergence is not supported in the literature of endogenous growth theory. To meet the presupposition of the authors, these low research and development intensive countries would have had to triple or quadruple their private and public research and development investments within a short period of time. As a matter of fact, none of the governments of the Southern European member states has declared in their National Reform Programs that they will match their own national research and development policy to the 3 per cent Barcelona target by 2010. Therefore, the authors' assumption concerning the fast catch-up of the laggard countries and the proximate and significant positive impact of the Lisbon Strategy on the less research and development intensive countries are vastly hypothetical and misleading. Only Portugal and Spain could move a bit closer to the global innovation frontier by in-

creasing its research and development intensity from 0.76 to 1.51 and from 0.91 to 1.35 per cent of GDP between 2000 and 2008 respectively, even though these figures lag behind the official targets announced in their own National Reform Programs and their annual growth rates of research and development investments, especially in Spain, are not particularly impressive. Although, Spain planned to double its research and development investment to 2 per cent of GDP by 2010, the authors of the Spanish National Reform Program (2005) assume on the basis of the modest progress of the research and development intensity in 2000-2003 that if the current growth rate were maintained, it would take another 20 years for Spain to reach that 2 per cent (Spanish Prime Minister's Economic Office 2005, 36., 47.). In addition, the study of the Laboratoire ERASME hazarded a guess that the greatest benefactor of the Lisbon Strategy among the EU member states is Greece. At the same time, the study of the Laboratoire ERASME forecasted that the high research and development intensive countries, like Finland and Sweden, will benefit rather modestly from the 3 per cent Barcelona target in long term, assuming that they will maintain their research and development intensity at the current level after 2010 as well. However, it is not a very plausible presupposition. On the one hand, the high and increasing share of the knowledge-intensive industries of Finland and Sweden in the total industrial output and their frontier positions on the global economy depends on whether they will keep up to accelerate their research and development intensities in the future, or not. On the other hand, the benchmark for the long-term innovation policy of Finland and Sweden is not the 3 per cent Barcelona target but the dynamics and trajectory of their most innovative global competitors.

The authors neglected the very fact that the industrial structures account for the major differences of research and development intensities among the EU member states. In countries where the significant part of the economic output comes from the high and medium high technology sectors, like, pharmaceuticals, computing and office equipment, communications equipment, scientific instruments, aerospace manufacturing and so forth, research and development intensities are certainly higher than in countries where the low and medium technology sectors like food producers, general retailers, tobacco, mobile and fixed line telecommunications, services, metals, banks, tourism, construction and materials, food and drug retailers, beverages, industrial transportation, mining, electricity and so forth produce the largest part of the economic output. In the latter countries, research and development intensity will remain fairly low if they do not lessen the relative size of the low and medium research and development intensive sectors in the economy.

Graph 2. R&D Expenditure per Capita in 2004 and 2008 in USD



Source: Calculations are Based on the Eurostat and the OECD Statistical Database
http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/introduction
http://www.oecd-ilibrary.org/science-and-technology/data/oecd-science-technology-and-r-d-statistics_strd-data-en

(last accessed on 26 February 2012)

The Barcelona Presidency Conclusions gave little attention to the significant differences of the research and development intensities, industrial structures, preferences and capabilities among the EU member states. Its objectives applied to all EU member states regardless of their distinct starting points, future prospects and time span for convergence towards the global innovation frontiers. The research and development intensity of the EU member states varied to a significant degree, it was dispersed from the Swedish 4.27 per cent to the Greek 0.65 per cent in terms of GDP in 2002. As the Lisbon Strategy Evaluation Document (2010) has rightly pointed out eight years later: "EU-level targets were too numerous and did not sufficiently reflect differences in starting positions between the Member States, particularly following enlargement. The absence of clearly agreed commitments also exacerbated problems with ownership. For instance, the performance of some Member States already exceeded the target, whereas for others targets were set at such level that meeting them within the available time-frames appeared unrealistic" (European Commission 2010, 6.).

The innovation, research and development policy of the Lisbon Strategy and the 3 per cent Barcelona target utterly demonstrate this undifferentiated, one-size-fits-all approach. Innovation, research and development strategy is mainly discussed as if the production, use and exchange of knowledge have only one, a European centered geographical dimension, and the performance of the European Union in this field is equal to the straightforward aggregate of the domestic performances of the EU member states which are supposed to converge towards the level of the most innovative countries by 2010. Income inequality, the stock of knowledge, the quality of government, institutional framework, innovation policy and infrastructure, the composition of human capital, the geography, the networks and nodalities of knowledge production, and the actual sector mix of the national economies were disregarded. The long-term convergence among the EU member states was thought to be a matter of course; sooner or later the low research and development intensive EU member states will be able to catch up with the most innovative countries and will get onto the global innovation frontier.

Verbalism, Inaction, and Governance Failure

Because the planning and financing of research and development policy mainly falls into the competence of national governments, and prerogatives are not assigned to the political institutions of the European Union in this policy domain,

the European Council has to leave the integration of the main objectives of the Lisbon Strategy into the budgeting processes, execution, and management of their national research and development programs to the EU member states. Due to the established system of the allocation of responsibilities between the political bodies and institutions of the European Union and the national governments, the European Union in the policy making process of research and development does not exercise legislative or executive power; it merely plays a broad visionary role. Furthermore, the European Commission and other political institutions of the European Union are in lack of capacity, financial means, and solid economic foundation to make detailed and applicable recommendations. In this way, the Lisbon Strategy and its follow-up documents did not go into details, did not reflect on geographical divergences, and did not render appropriate schedules and priorities for each individual EU member state in accordance with the different stages of their economic development and did not provide special funds and programs for the less research and development intensive countries, especially, for the new EU member states. The European Union distributes the limited amounts of EU research and development funds on the merit-based assessment of the individual projects in accordance with its own, instituted thematic priorities, and does not apply, for instance, the Rawlsian maximin, leximin, or other kind of rule utilitarian principle in order to redistribute some part of its community research and development budget first on behalf of the least research and development intensive countries, or regions (European Commission 2007). That is true that community block grants to universities and other public and private research centers would not provide a very efficient and cost-effective way of financing and improving research and development intensity in the European Union compared with selecting and financing regionally concentrated knowledge clusters on the merit-based assessment, but if the original aim of the Lisbon Strategy is to raise the less innovative EU member states and to level up to the higher research and development intensity across Europe, the application of some kind of rule or negative utilitarian principle in case of the distribution and use of resources is inevitable. An integrated strategy of the European Union for innovation, research and development activities which follows either rule utilitarian, ordinal utilitarian, merit based, or multiple principle concerning the distribution and use of research and development resources is still being awaited. Therefore, each country could mostly use its own human and economic resources and follow its own innovation, research and development strategy and space of development which could fit to its industrial structure as well as its political agenda. As the Treaty of the European Union (2008) declares, "The Conference agrees that the Union's action in the area of research and technological development will pay due respect to the fundamental orientations and choices of the research policies of the

Member States" (European Council 2008, decl. 34. on art. 197.). Briefly, while the European Union continuously endeavors to expand its activity into agenda setting, decision making processes, control and enforcement in more and more policy domains, there are not shared political responsibilities and competencies between the political bodies of the European Union and the EU member states in innovation, research and development policy (Alesina and Perotti 2004, 14-15.; Búrca 2003, 814.).

Under the recent constitutional construct, the political responsibility and competency of setting, financing, managing and supervising research and development policy resides almost solely in the national governments, even if the production, use, and exchange of knowledge, its spillover effects, positive and negative externalities make impact far beyond their territorial sovereignty and barely fit the limits of nation-state. For this reason, the creation of the European Research Area (ERA) was addressed to take the pro-active steps in the field of innovation, research and development in order to overcome the "fragmentation, isolation and compartmentalisation of national research efforts and systems and the disparity of regulatory and administrative systems" in June 2000, however, this initiative could not prop up the fall of the European position in the global innovation ranking in the following years due partly to the very limited – about 0.03-0.05 per cent – financial contribution to the total research and development expenditure of the EU member states (European Commission 2000, 4-7.).

Instead of sharing political responsibilities, dividing competencies, or conferring the legislative and executive power on the supranational institutions of the European Union, which would have been worrisome for a democratic society, and constitutionally and politically unfeasible due to the lack of legal basis and popular support for the interference of the political institutions of the European Union in internal affairs, and the economic, social and cultural differences of the EU member states, a new form of governance emerged for coordinating and implementing common policy objectives and processes in innovation, research and development, and other important social, economic, and environmental domains where legislative and executive actions on community level cannot be initiated (European Council 2000, §§ 5., 37.; European Commission 2001, 2003). After establishing positive constitutional limits to the intervention of the political institutions of the European Union in the fields of innovation, research and development, the so-called open method of coordination was introduced for the purpose of setting up community guidelines and timetables for national policies, developing performance indicators and benchmarks, monitoring and peer-reviewing national processes and promoting best practices. The open method of coordination has been operated under the su-

pervision of the EU Scientific and Technical Research Committee (CREST) since 2003 although the actual influence of the CREST "as an operational interface to define and oversee the implementation of the open method of coordination in respect of the 3 % objective" on policy coordination and implementation is not really recognizable in the official documents (European Council 2003).

In the academic literature, the open method of coordination as the new form of governance received favorable assessment at the outset (Scott and Trubek 2002, 1-18.; Armstrong 2005; Kröger 2009). It was supposed to lead to the substantive, more democratic reorientation of political agenda setting, decision making processes, and the common goal's implementation of the European Union, and to concert genuine collective action based on mutual responsiveness, commitment to the joint activity and mutual support among the EU member states and their constituencies.[6] Besides, a few authors credited it with the emergence of the multi level governance and the materialization of authentic democratic ideal – reflexive deliberative polyarchy – which provides forum for public deliberation among the various stakeholders to be affected by the decisions aiming at free and reasoned agreement upon the common goods and interests in a quite diverse political community (Gerstenberg and Sabel 2002, 291.; Cohen and Sabel 1997, 317.). By contrast to these favorable views, few authors discussed critically and evaluated the open method of coordination without constitutional foundation, binding rules and sanctions as the second best solution which was introduced to overcome the constitutional stalemate of the collective action of the EU member states in many important policy fields, like economic policy, social policy, employment, public health, research and development, and so forth. In spite of the predominantly favorable evaluations in the academic literature, the open method of coordination could foster neither dynamism, nor convergence, nor genuine deliberative processes in the fulfillment of knowledge-based economy and society project since 2000. Its deployment has not resulted better, more efficient, more democratic, and more coordinated decision making in the fields of innovation, research and development policy among the EU member states; it has not made any visible impact on reversing the stagnant and declining trends of the last decades, yet. Because the new constitutional treaty of the European Union does not refer to the open method of coordination by name, its legal status as a new form of governance has remained vague and unresolved. Although, efficient legal and institutional setting is the essential instrument of conducting common policy objectives, it must be admitted that the failure of the fulfillment of the 3 per cent Barcelona target can be attributed to the vagueness and internal contradictions of the Lisbon Strategy as well as po-

6 I use Michael Bratman's notions to describe the preconditions of collective action (Bratman1999, 94-108.).

litical inertia and collective action problems rather than the contingent legal status of the open method of coordination as such.

After realizing the five-year inaction of the majority of the EU member states in the mid-term review of the Lisbon Strategy, the Presidency Conclusions of the Brussels European Council of 22 and 23 March 2005 endeavored to reinforce the Lisbon Strategy by putting a stronger emphasis on growth and employment, and communicated the importance of reallocation of public and private resources on behalf of innovation, research and development. The Presidency Conclusions of the Brussels European Council consented to the predictions of endogenous growth theory which regards knowledge, innovation, human capital formation, proper legal and institutional arrangements as the primary sources of long-term economic growth. Briefly, high public and private investment in innovation, research and development with large knowledge spillovers gear up for a high and steady economic growth rate of the European economy.

The Presidency Conclusions did not offer any explanation about what kind of market, institutional and political failures deprived the majority of the EU member states of aligning national policies with common research and development policy goals if the basic tenets of endogenous growth theory are so obvious and beneficial, and if the accord of the EU member states in the objectives of the Lisbon Strategy is unanimous. While, the EU member states in the official documents speak with one voice in matters of innovation, research and development policy – like "[k]nowledge and innovation are the beating heart of European growth," "[i]n advanced economies such as the EU, knowledge, meaning R&D, innovation and education, is a key driver of productivity growth," "[i]nvesting in the knowledge should increase the capacity of the EU to innovate and to produce and use new technologies," and so forth –, the majority of them keep acting in quite contradictory manner in the following years, as well (European Commission 2005, 4., 21., 30.). As the long-term rigidity of the allocation of budgetary resources demonstrate, the majority of the EU member states does not accentuate innovation, research and development as the most important political and economic priority for the future economic and social development and also resist to harmonize their national policies with the Lisbon Strategy by way of the open method of coordination even if it appears to be a quite flexible and suitable instrument to take each country's economic situation, particular political and social interests into consideration and to facilitate the resolution of collective action problems among the EU member states. Mainly due to the ambivalent political commitment of the majority of the EU member states to the Lisbon Strategy, the open method of coordination could not become an effective and important instrument for encouraging the common strategic actions of the

EU member states and for setting the national public as well as private innovation, research and development policies in an integrated supra-national framework of the production, use, and exchange of knowledge (de la Porte 2002, 38., 39.; Búrca 2003, 814., 820.; Bruno, Jacquot and Mandin 2006, 519-536.).

In spite of the substantial gap between the political aspiration and actual achievement, the political communications and documents issued by the European Commission and the European Council regularly have recourse to the Lisbon Strategy as the blueprint of future policy and economic actions. Surprisingly, the Lisbon Strategy as a brand name of the political ineffectiveness further serves as a panacea for economic recovery in time of economic crisis and deep recession (European Commission 2008; European Commission 2010a).

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