



Quality Infrastructures Improve the Economies of Balkans and Eastern European Countries

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Abstract

The development of a common market for goods and services including a pan-European integrated industrial, technological and trade policy has represented the main challenge at the European Union level in the last years. In particular emphasis is given to Eastern European Countries (EEC) and Western Balkans which represent the Enhanced European Economic Area. European authorities have identified that in order to deepen the European integration process, and thus provide the full benefit of it to the European citizens, the integration of the goods and services sectors must be accompanied by an integration of the industrial sector by the development of certain Quality Infrastructures. Although certain infrastructures have developed in EU-28 countries, there is a challenge of the integration to EEC and W. Balkans systems and how this has influenced the economies and competitiveness of these economic areas. In this context and considering the fast growth and development of the industrial sectors from the new member states it appears reasonable to investigate which have been the main achievements in the integration process made by these sectors and also the futures challenges that may prevent the deepening of this process. Thus, the aim of our research is to analyse the progresses made so far in the integration process of the new member states industrial sectors from Quality infrastructures point of view while also underling the main challenges that prevent the deepening of this process.

Keywords

Quality Infrastructures; Standardization; Innovation; sustainable development; EuropeAid program; EEC & W. Balkans.

Introduction

Eastern European Countries (EEC) and W. Balkans are of growing political relevance for the European Union (EU). Balkans are preparing themselves to become part of the EU, and since 2004, Southern Mediterranean countries, Eastern European countries and Caucasus have been “targeted” by the European Neighbourhood Policy (ENP). The Lisbon Treaty committed the EU to the “development of a special relationship with neighbouring countries aiming to establish an area of prosperity and good neighbourliness founded on the values of the European Union and characterised by close and peaceful relations based on cooperation”. EU flagship programmes, Europe Aid and Twinning, have already been targeted at neighbourhood countries for many years. Quality Infrastructures are increasingly being included as action to enhance sustainable development, in line with the objectives of EU 2020 Horizon. In this context, this paper emphasizes the importance of smooth development of Quality Infrastructures in this EU Economic Areas in terms of connectivity to sustainable development, educational parameters, good practices and indicate how EU Aid funding programmes could support this transition in EU neighbouring countries (see Table 1). The result will shed some more light on how the EU and its

neighbouring countries can further cooperate at Quality Infrastructures.

TABLE 1: LIST OF THE EU COUNTRIES IN TOTAL (SOURCE: [8])

EU Neighbouring Countries Covered	
Balkan Countries	Albania, Bosnia and Herzegovina, Croatia, the Former Yugoslav Republic of Macedonia (FYROM), Montenegro, Serbia, Kosovo, Bulgaria
Eastern European Countries	Belarus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldavia, Poland, Romania, Slovakia, Slovenia, The Russian Federation, Ukraine
Caucasus Countries	Armenia, Azerbaijan, Georgia
South – East Countries	Cyprus, Greece, Turkey
Rest EU countries (non examined in the study)	
EU Member States (rest)	Austria, Belgium, Demark, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, Switzerland, United Kingdom

Existing literature does not provide a clear picture of Quality Infrastructures (QIs) deployment in the target countries covered in this study neither a thorough correlation between QI and sustainable development is indicated. In many of these countries the whole Quality Infrastructures can be considered as being still under constant development.

Analysis

Two broad questions are raised through this research. First, "how does Quality Infrastructures (QIs) benefit the economy?" And second, "what can EEC and Balkan governments do to increase the economic benefits obtainable from standardization?"

A. Quality Infrastructures (QI)

By the term Quality Infrastructures (QIs) we indicate a balanced system of sub - modules which collaborate efficiently under a scheme of national support. The following structure is a typical QI system (Table 2).

TABLE 2. TYPICAL QUALITY INFRASTRUCTURE SYSTEM

Aspect	Sub Module of QI	Module of QI
Product related	Legal Metrology	Market Surveillance
	Testing Laboratories	
	Calibration Laboratories	
	Inspection Bodies	
	Conformity Assessment Bodies	
(more) Process related		Accreditation
		Standardization

As noted before, there are several other conceptions of QIs and their modules correlation which play an important role on the establishment of a QI. The following chart provides another view of QI usual incompatibilities (Figure 1).

ELEMENT	Technical Regulation	Standardisation	Conformity Assessment (voluntary)	Market Surveillance	Testing laboratories	Legal Metrology	Scientific Metrology	Accreditation
Technical Regulation		No	No	See 1	See 2	See 3	See 3	Yes
Standardisation			See 4	No	See 4	See 2	Yes	See 2
Conformity Assessment (voluntary)				No	Yes	No	See 5	No
Market Surveillance					See 4	Yes	Yes	See 6
Testing laboratories						No	No	No
Legal Metrology							Yes	Yes
Scientific Metrology								See 4
Accreditation								

FIGURE 1. QI USUAL INCOMPATIBILITIES (SOURCE: [7])

Notes:

1. The sampling and testing should be separated from the penalties attribution. Penalties could stay with the service responsible for the operation of the relevant regulation.
2. To be avoided because of different nature of activities. In any case different decision making system is necessary.
3. Different nature of activities.
4. Possible under the condition that there are separate decision – making systems and that equal possibilities would be given to private bodies to be active in the Conformity Assessment
5. Appropriate for calibration activities only, subject to accreditation.
6. Market surveillance should not be involved in accrediting bodies for the avoidance of a preferential treatment of products / services certified by bodies accredited by the system.

Moving from QIs structures to a wider view of Quality Management, we could point out other aspects which are correlated to economic indices and competitiveness, as is shown in the House of Quality (Figure 2).

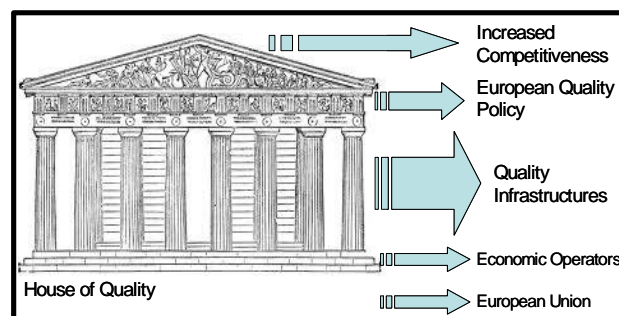


FIGURE 2. HOUSE OF QUALITY (SOURCE: [2])



The heart of QIs is standardization, which encompasses both product and process aspects and will be further analysed in the following paragraphs.

1) Standardization Literature Review

There is a large and complex literature on standardization, written by academics, practitioners and policy makers. Successful standardization does some or all of the following:

- Standardization defines some of the characteristics of processes and/or products which should be followed to make them suitable for use, likely to succeed in the market, understandable to the consumer, consistent with offering from other producers (e.g. David, 1987; DIN, 2000; Krechmer, 2000a; de Vries, 1999: [4])
- Standardization helps to build focus, cohesion and critical mass in the formative stages of a market (e.g. Krechmer 1996b; Swann and Watts, 2000: [4])
- Standardization reduces transactions costs between different producers and between producers and customers (e.g. David, 1987; DIN, 2000; Hudson and Jones, 1997, 2000b, 2000c; Krechmer, 2000a: [4])
- Standardization of measurements allows innovative producers to demonstrate to the satisfaction of the customer that products are as innovative as they claim to be (e.g. Tassej, 1982; Swann, 1999: [4])
- Standardization reduces risks as perceived by producers and by customers (e.g. David, 1987; DIN, 2000: [4])
- Standardization codifies and diffuses state of the art technology and best practice (e.g. Krechmer 2000a; Blind and Grupp, 2000: [4])
- Standardization captures trends in customer demand (e.g. DIN, 2000: [4])
- Open standards are desirable to enable a competitive process of innovation-led growth (e.g. Krechmer, 1998: [4])
- There is an important "public good" aspect to standards (e.g. Kindleberger, 1983; Berg, 1989a, 1989b: [4])
- Companies that use standards perform better (e.g. Adolphi and Kleinmeyer, 1994; DIN, 2000; Perez, 1994; Toth, 1984, 1990: [4])
- Standardization can increase trade (e.g. Swann et al, 1996; Blind, 2000a, 200b; Blind and Jungmittag, 2000: [4])

- Standardization contributes to economic growth (e.g. Blind *et al* 1999b; Jungmittag *et al*, 2000: [4])
- In short, the existence and use of standards makes it easier to produce, sell and buy products and services. Standards enable a market. They are part of the infrastructure for innovation-led growth. However, their ability to do all these things depends on the process by which they were prepared. They will only if they are produced by a process in which concern for quality is taken seriously. Moreover, they cannot be expected to codify the state of the art unless those at the technological frontier participate in their definition.

2) Standardization in the global economy

Standardisation is a voluntary process for the development of technical specifications based on consensus amongst the interested parties themselves: industry in first place, but also a variety of users, interest groups and public authorities. Standardisation is a cooperation among private interests, which also has an important dimension of general interest. In Europe, standardisation has been entrusted for the last 40 years to industry with the participation of other stakeholders.

Formal standardisation includes the following organisations [1]. [2]:

- At national level, 1, 2 or 3 national standards bodies are the recognised members of the system, depending on whether or not there are specific bodies for the electro technical and/or telecommunications sectors
 - At European level, there are three recognised European Standards Organisations (ESOs), CEN, CENELEC and ETSI. National standards bodies are members of CEN and CENELEC, which are based on the principle of national delegation in their governance and procedures: national members take decisions at European level. In contrast with this, ETSI functions on the basis of direct membership of companies, administrations and other organisations
 - There are 3 recognised international standards organisations ISO, IEC and ITU. National standards bodies are also the members of ISO and IEC, whereas the members of ITU, which is part of the system of United Nations, are national governments.
- Whilst there are no organic links between the European and the international level of standardisation (apart of –national- members

belonging to both levels), there are agreements for cooperation between ISO and CEN, between IEC and CENELEC, and between ITU and ETSI.

At the same time, industry engages in informal standardisation in hundreds of professional associations, usually called *fora* or *consortia*, with different characteristics in terms of longevity, sectoral coverage, and territorial scope, which is often global and thus may clash with the 3-level structure of formal standardisation. In some technological fields informal standards development organisations benefit from allocation of more expertise from the private sector and, therefore, have bigger impact than the formal organisations.

Actual use of standards depends on the perception by the different market players of the contribution of standards to their interests and their capacity to use them, in the context of their business strategy and regulation. Whilst usage of standards which have been developed in support of regulation is normally effective, other standards may fail to achieve relevance because of lack of visibility, the existence of competing standards or the absence of appropriate market incentives.

3) Standardization and Education

Standardisation is of strategic value both for the public and for the private interest. However, many business and governmental actors, including top management and researchers, do not feel they are concerned by standards issues, and standardisation activities are often consequently neglected. Education may play an important role in correcting this situation in the long term:

- Introducing standardisation issues to university curricula is a promising avenue for strengthening the contribution of standards to the competitiveness of Europe.
- Other trading partners such as China and Korea have already undertaken efforts to make future actors familiar with the benefits of standardisation and the issues which arise in the process

Recently, the standards community has increasingly been focusing on standardisation education (Hesser & Czaya 1999, de Vries & Egyedi, 2007; de Vries, 2011: [5], [6]). There are several reasons for this. Firstly, it is difficult to overrate the impact that standards and standardisation have on modern societies and social interaction. Standardisation, however, can fully unfold

its beneficial potential only as long as the relevant actors (regulatory authorities, standards developing organisations, companies, consumers, users and other interest groups) are able to make appropriate decisions and to conduct their standards activities in a professional, effective fashion. Together with metrology, testing and quality management, standardisation and the organisations to support it are essential elements of a country's QI system and are essential for facilitating international trade (WTO, 2005: [2]).

Secondly, the demand/need for standards expertise can be expected to grow in the future for a number of reasons: socio-economic and technological integration will continue in the long term and crucially depend on the availability of adequate standards and the capability to develop such standards. Furthermore, adequate standards are a prerequisite for advanced technologies such as nanotechnology to enter markets on a large scale. However, the preparation of such advanced standards is becoming increasingly demanding and complex, which immediately calls for sufficient manpower and expertise to accomplish the necessary tasks.

As a result of these trends, job requirements have risen sharply for everyone who deals with standardisation issues – from the technical expert who prepares standards in a Working Group, to the business strategist who needs the development of new products/markets or to the policy-maker who relies on standardisation as a regulatory instrument. In this respect the “good old way” of standardisation education – i.e. learning by doing/learning on the job without any prior or, at best, only limited knowledge of standardisation – is no longer really viable and new educational concepts are needed. The old perception that the persons who know the (scientific or technical) content can alone develop the relevant standards is, since long time abandoned. As it is said ‘those who know what should be written in a standard, should also know also how to write a standard’. The need for education on standardisation has been addressed in several studies (Verma, 1973; Hesser & Czaya 1999; Korukawa 2005; de Vries, 2005; de Vries and Egyedi, 2007; Krechmer, 2007; Cooklev, 2010: [6]).

The need for standardisation education in industry is latent rather than manifest. Considering the case of industry participants in international standardisation, literature has revealed more than 100 factors that



contribute to successful participation in international standardisation committees (Brons, 2007: [2]). Most participants in international standardisation are not aware of these factors. They spend several days or weeks a year in standardisation activities and have the impression that they are doing a good job but are not aware that their efforts could be much more effective. The “volunteer-approach” they have makes the need for efficiency not so visible...

There is some demand for “standards engineers” (experts) but there are neither official descriptions nor formal training for such positions. Due to the lack of a formal curriculum, the selection of such professionals is mostly based on his/her previous practical experience in standards and related standardisation activities, and on his/her proficiency in specific soft skills. In addition to the technical standardisation experts (standards engineers), who are usually appointed as technical experts for the development of standards in standardisation committees, there are two other demand groups in companies. Firstly, the employees in the standardisation departments are main contacts and coordinators for all standardisation activities within the company. Secondly, the management as a decision-maker for strategic standardisation activities in the company has to be granted a principal role. Here, especially, the strategic aspects of standardisation are important. Most companies, in particular SMEs, have no standards expert or standardisation department at all Vries et al. (2009: [6]).

Standards and standardisation are core business for standardisation bodies, so one might expect them to be centres of standardisation expertise. DIN requires from its staff that they should have passed exams in some standardisation courses (Behrens, 2010). However, such recognition of the importance of real standardisation expertise for standardisation bodies is not widespread. Standards bodies are not only potential users of standardisation education, but many of them offer it as well, albeit only for further education. It is therefore important to distinguish between

- Professional training in the field of standardisation and
- Academic education in the field of standardisation

National governments play different roles related to standards and standardisation (De Vries, [5]), they can:

- Support standardisation, through a legal foundation, as a part of their general role in stimulating business performance and international trade
- Carry out standardisation activities themselves (in many countries, in particular in the former Soviet Union and in developing countries, the national standardisation organisation is a governmental agency)
- Supplement, simplify, or improve their legal system with standardisation by making references to standards in laws
- Use standardisation for specific public sector tasks (for instance, in the areas of public health, environmental protection, traffic infrastructure, army, and police. Then governmental interests are comparable to those of companies with a dominant market position or companies as main users)
- Use standardisation to improve their performance in areas that are not specifically governmental (for instance, procurement, IT systems, occupational health and safety of government workers)
- It is responsible for education. The government may include standardisation knowledge in its criteria for accreditation of educational programmes (Spivak and Kelly, 2003; Cooklev, 2010: [6]).

Many governments seem to be insufficiently aware of these different roles and lack a policy that addresses the different roles.

B. Innovation

Within the renewed Lisbon agenda, innovation is central to the preservation and improvement of the welfare of European citizens. Many different elements in the realms of education, science and markets have to come together in order to achieve successful innovation. As part of the EU strategy for innovation, the Commission and the Council of the European Union have identified standardisation as one of the key instruments to be improved [2]. Standards can be decisive for commercial success, in helping to aggregate demand for innovation activity. Ensuring interoperability is also important in order to avoid

fragmentation of the Single Market. Standards can determine the success or failure of new technologies.

1) Law and Innovation

There is a substantial challenge of matching “Law” and “Innovation” against time and technology constraints. From centrally to market economy there is a gap of law which should follow the technology developments. The faster technical regulations are shown up the less technology loss because of law is indicated. This is mapped in Figure 3 (E. Vardakas, 2008: [7]).

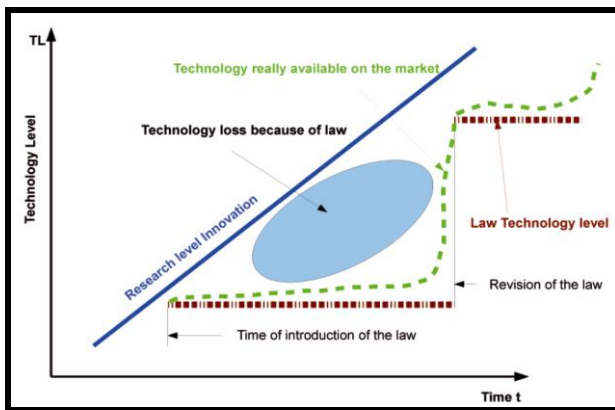


FIGURE 3. LAW AND INNOVATION CORRELATION

2) Standards and Innovation

Following the above presentation between “Law” and “Innovation”, there is also another correlation of “Standards” and “Innovation”, Figure 4 (E. Vardakas 2008: [7]). As technology increases over time and the faster standards created the less innovation loss is indicated.

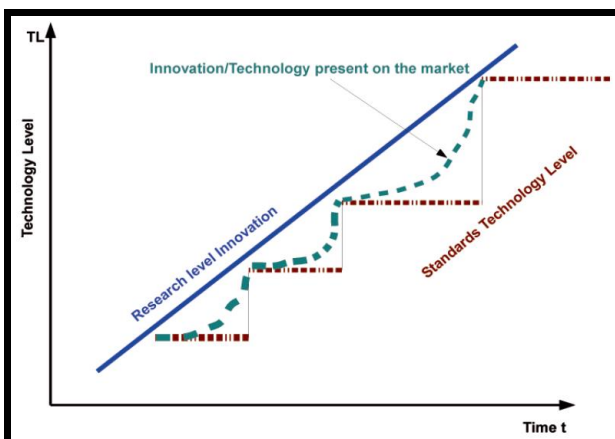


FIGURE 4. STANDARDS AND INNOVATION CORRELATION

Standardisation and innovation are often perceived as conflicting processes. Whereas innovation strives for excellence and exclusivity, standardisation strives for

predictability and a level playing field, and standards are in many aspects a public good. However, in an apparent paradox, standardisation can make an important contribution to innovation:

- Innovation needs either to combine some new piece of technology or novel organisational practice with existing elements of a product, service or process, or to recombine existing technologies or practices in a new way. In this way, it is clear that following established standards in a conventional way will hardly lead to innovation

- Nevertheless, innovation benefits from standards in many different ways:

- Standards for interoperability are essential for allowing innovations to complement existing products and services and integrate existing systems allowing open markets and competition. In other cases innovators need the development of new standards prior to the provision of new products or services. Standards for interoperability also allow innovators to reap the benefits of network effects in delivering their products/services.

- Measurement standards allow innovators to differentiate their product/service offer, or to improve their internal processes. An example here would be standards for the measurement of the aerodynamics of high speed trains

- Standards for safety, quality and environmental performance allow innovators either to follow market expectations (and in some cases legal requirements) or to exceed them. This allows market entrants to benefit from the trust which the usage of standards conveys, and without which more conservative solutions could be preferred by customers

- Management/Process standards may generate improvements in all aspects of a company: better quality, new schemes of internal organisation and of service delivery, and also facilitate the creation of new products and services.

Standards thus play a role in facilitating interoperability, safety and trust, whilst leaving ample room to innovators for capturing the market on the basis of novelties in other aspects of the product, service or process.

3) Knowledge Triangle and Innovation

There is also a cognitive dimension in standards which contributes to the diffusion of innovation. Many



standards (clearly those for interoperability, test methods and quality) also embody knowledge, and their development and dissemination contributes to knowledge transfer. For example, access to standards for in-vitro testing allow practitioners to capture essential elements of the state of the art of the technique, which in turn are valuable for improving the quality of diagnostics and on this basis offering new services. Standardisation is one among many existing instruments for knowledge transfer, such as scientific publications, patents, disclosure of proprietary interfaces, etc. In this respect, it is up to those owning intellectual property on research results to decide which is the most appropriate vehicle in order to reap the benefits of an investment, and standards allow the dissemination of knowledge while respecting intellectual property rights.

However, it should be underlined that the trend, especially in the last 30 years in Europe, of development of "performance standards" instead of "descriptive standards" has reduced the role of these standards as vehicles of technology transfer. Descriptive standards can be considered as a "design guide" to some producers. They give "solutions" for the important aspects of the products. On the contrary, performance standards are in reality abstract descriptions of the solutions sought by the designers of the products. It is obvious that every product standard has to find the appropriate equilibrium point between facilitation of innovation (i.e. more performance oriented standard) and facilitation of technology transfer (i.e more descriptive standard).

A rigorous approach on Innovation in EU is encouraged by the European Institute for Innovation and Technology (EIT) which link the knowledge triangle components of education, research and businesses across Europe into an innovation system (Figure 5, source: [3]). For example, a skilled workforce is the basis for undertaking research and development activities, as well as for bringing new products and processes to the market. In return, knowledge and new market developments should have a feedback loop to educational programmes. Similarly, new knowledge is the source of innovation and in return, new market prospects for innovation can point towards new avenues for research. This process is captured by the concept of the knowledge triangle. This could be better formalised through

eliminating the Standardisation gaps between the three components of it.

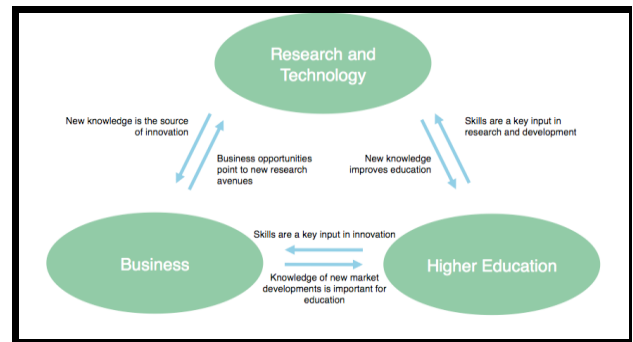


FIGURE 5: THE KNOWLEDGE TRIANGLE (SOURCE EIT, 2012: [3])

C. EEC & W. Balkans

1) EEC & W. Balkans Socio - Economic background

The EEC & W. Balkans countries region is characterised by the existence of a highly diverse mosaic of countries varying in size and dynamics. The following paragraphs briefly present an overview of the socio-economic contexts considering indications provided by the World Bank.

In 2011, the total population of the 27 EU EEC & W. Balkans countries was 429,258 m inhabitants, compared to the 388,041 m inhabitants of the rest 14 EU Member States (table 1). As would be expected, there are considerable differences between countries both in terms of demographics and national revenue. A majority of the total population is concentrated to the Russian Federation together with Ukraine which accounts 44%; the EEC countries accounts 20% of the total population; and the rest South East Countries accounts 20% of the total population; the Balkan countries accounts 16% of the total population.

Demographic trends are an important factor to keep in mind when explaining the current and future changes in Quality Infrastructures (QIs). Unsurprisingly, EU neighbouring countries lag behind Western countries in terms of Gross Domestic Product (GDP) per capita. The levels of national wealth and income are also a key determinant in the development of education in standardization.

A Socio-Economic visualization is given by The World Bank's Knowledge Assessment Methodology (KAM: www.worldbank.org/kam) which is an online interactive tool that produces the Knowledge Economy Index (KEI) [8] an aggregate index representing a country's or region's overall

preparedness to compete in the Knowledge Economy (KE). The KEI is based on a simple average of four sub-indexes, which represent the four pillars of the knowledge economy: Economic Incentive and Institutional Regime (EIR), Innovation and Technological Adoption, Education and Training, Information and Communications Technologies (ICT) Infrastructure .

2) EEC & W. Balkans Quality Infrastructures status

By aggregating data provided by the World Bank (source 2012, Infrastructures rankings), we could indentify the distribution of infrastructures operating in EU neighborhood countries, emphasizing data relative to “quality certifications”, “technology licenses”, “customs, trade, government regulations” and “business licensing”, as follows in Table 3 (World Bank, 2012 dataset: [8]):

TABLE 3: INFRASTRUCTURES VIEW (WORLD BANK, 2012 DATASET: [8])

Economy	Year	A	B	C	D	E	F	G
All		16,0	15,2	72,6	5,7	9,5	15,4	17,9
Eastern Europe & Central Asia		17,9	20,8	72,2	7,5	10,4	15,8	14,4
High-income OECD		37,2	18,3	85,0	7,5	10,2	13,0	7,3
Albania	2007	24,6	38,6	73,1	16,3	18,7	10,6	22,2
Armenia	2009	26,9	40,3	66,3	19,4	10,3	5,6	26,5
Azerbaijan	2009	18,2	23,8	70,5	4,8	3,0	8,5	7,1
Bulgaria	2009	19,9	12,5	80,9	4,5	10,6	8,9	4,1
Bosnia and Herzegovina	2009	30,1	25,3	75,3	5,5	11,2	19,4	12,5
Belarus	2008	13,9	18,2	74,8	7,7	13,6	40,8	30,1
Czech Republic	2009	43,5	11,6	90,0	10,5	10,4	13,7	10,7
Estonia	2009	21,2	25,5	78,0	3,4	5,5	3,4	3,3
Georgia	2008	16,0	16,8	49,7	11,4	2,1	10,7	12,0
Greece	2005	11,7	...	88,2	...	1,8	7,7	5,5
Croatia	2007	16,5	22,5	75,5	7,2	10,9	9,9	8,9
Hungary	2009	39,4	13,1	78,8	3,2	13,5	15,6	3,6
Kosovo	2009	7,9	20,3	63,9	2,6	9,8	7,5	11,2
Lithuania	2009	15,6	24,9	77,7	13,3	9,3	23,4	4,7
Latvia	2009	18,2	28,0	72,8	2,7	9,7	14,4	11,4
Moldova	2009	9,1	14,9	60,0	1,8	7,0	20,0	27,4
Macedonia, FYR	2009	21,5	41,2	74,7	9,3	14,5	14,7	14,6
Montenegro	2009	13,0	17,2	76,5	6,1	6,8	2,7	5,4
Poland	2009	17,3	6,4	82,4	9,2	12,8	21,5	10,3
Romania	2009	26,1	15,9	81,3	22,0	9,2	29,9	16,1
Russian Federation	2012	12,6	7,7	71,7	8,9	14,7	15,6	16,0
Serbia	2009	21,8	14,7	69,3	8,2	12,2	12,7	17,7
Slovak Republic	2009	28,6	30,1	86,2	8,8	6,7	9,6	7,6
Slovenia	2009	28,0	15,3	84,8	10,4	7,3	4,6	4,7
Turkey	2008	30,0	15,6	65,1	9,7	27,1	24,0	12,3
Ukraine	2008	13,0	26,6	77,0	3,8	11,3	32,7	24,5

Where,

A: Percent of firms with an internationally-recognized quality certification

B: Percent of firms using technology licensed from foreign companies

C: Capacity utilization (%)

D: Real annual sales growth (%)

E: Senior management time spent dealing with the requirements of government regulation (%)

F: Percent of firms identifying business licensing and permits as a major constraint

G: Percent of firms identifying customs and trade regulations as a major constraint

...: No Data Provided

3) EuropeAid Development and Cooperation

EuropeAid Development and Cooperation is responsible for designing European development

policy and delivering aid throughout the world. EuropeAid delivers aid through a set of financial instruments with a focus on ensuring the quality of EU aid and its effectiveness.

The EU's evolving relationship with its partners in the Neighbourhood and the transition in the Southern Mediterranean called for a new policy response, set out following a Strategic review of the European Neighbourhood Policy (ENP).

Two flagships programs are the main drives of this EU wide initiative: a) EuropeAid and b) Twinning. Both are focused on the external aid to EU neighborhood countries and are the catalyzing vehicles to support the development of Quality Infrastructures in the EEC & W. Balkan Countries.

Conclusions

EU neighbouring countries present a dynamic landscape with regard to the organisation of Quality Infrastructures. Most of these countries are currently reforming their systems with the intention of better matching EU country organisation and they display high levels of commitment and motivation towards this end. However, there are still challenges to be overcome for the future development of Quality Infrastructures in these countries. Challenges appear at the following paragraphs. These challenges are anticipated that will feedback both pools of society: a) European Union society as far as the formulation of better EuropeAid and Twinning Programmes in the field of Quality Infrastructures driven by their impact in business performance and b) the EU Neighbourhood countries on developing “strategic” Quality Infrastructure Systems which take into account indicative by this study challenges.

A. Quality Infrastructures Challenges

1) Orientation

The transition from centrally planned to market driven economy puts the Quality Infrastructures (QIs) in previously centrally planned economies in a new perspective, as shown in Table 5 [7]. The following may be taken into account:

- Centrally planned economy QIs institutions cannot unchanged support trade agreements like



ACAA's or WTO participation. This is mainly due to the legacy of perception of "standards" as typical regulations with obligatory character.

- Spreading of relevant knowledge and support for the creation of citizens movements for consumers and businesses are crucial.
- Scrupulous check of potential conflict of interests in the relevant systems is a must

TABLE 5. CENTRALLY PLANED TO MARKET DRIVEN QIs

Centrally Planned QIs	Market Driven QIs
Unconceivable as non-obligatory	Conceived for voluntary application
The qualitative part of the central plan	Supporting mainly private contracts
The country's macro-design tool	Tool for technology transfer
Descriptive by their very aim	Performance – oriented content
Single structures covering all aspects	Independently acting bodies
Non-development of private sector	Important private sector involvement
Management bodies only nominated (non transparency)	Representative management bodies (built in transparency)
Built-in conflicts of interest	Absence of conflicts of interest

2) National Policy

Considering the socio-economic indicators provided by the World Bank dataset, along to current literature there is a clear connection of the impact of Quality Infrastructures to nations' sustainable development. Therefore a strategic national policy on Quality Infrastructures may encourage better contribution to standards, faster anticipation of technologies, faster law formulations including intellectual & industry property issues. In addition, it is anticipated that there will be a balanced public and private funding for the operation of certain QIs. Like the "hard" infrastructure there is a strong public good element to the standardization infrastructure. There is a role for government and/or government agencies to keep this standards infrastructure in good shape, and in trying to ensure that there is balanced participation in the creation of standards.

In a typical market, when the rate of change is rapid, producers need standards quickly, but customers need the confidence offered by high quality standardization. There is a mismatch between the rate of innovation,

the requirements for rapid standardization on the part of suppliers and the need for quality standardization on the part of empowered customers. Speeding up the standardization process is not necessarily the right answer to this mismatch.

The "ideal model" for the involvement of national standards bodies and government in the standardization process has two components. The first is to correct the typical imbalance in participation. Government can help to balance participation by subsidizing some marginal or ill organised and financed participants, and by acting in extreme cases very carefully as the representative of excluded interests.

A sound National QI fosters innovation, competitiveness, consumer protection, promotes market transparency and the elimination of technical barriers to trade (TBT) which, in turn, promote access to new markets, job creation, encourage investment and a more careful use of natural resources.

3) Education in Standardization

As identified in this study, there should be additional resources planning in technical education in Standardization considering current trends and focusing either in professional or academic courses. This may work as well as a knowledge transfer tool and feedback the society with better understanding of standards, technologies as such end to national competitiveness.

In some ex-centrally planed economy countries (e.g. Ukraine) educational institutions (self standing or working as part of broader institutions) already exist. However, sometimes the orientation and the content of the relevant curricula need dramatic re-orientation to cater for the (new) needs as eg. Voluntary standards, WTO obligations etc.

4) Knowledge Triangle Governance model

Another challenge is the adoption of the Knowledge Triangle governance model in new innovative firms and the role of QIs – standardization in its success. Issues such as IP rights, R&D patents, papers, research, and business performance are included in this.

A few proposals for facilitating the use of standards in support of innovation are:

- In order to provide SMEs with the benefits of standards without the full burden of technical

¹ Agreements on Conformity Assessment and Acceptance of Industrial Products (European Commission Doc. SEC(2004)1071, 25 Aug. 2001)

complexity, a comprehensive programme by standards makers to publish abstracts of European Standards and simple usage guidelines without access restriction needs to be set up

- The standards organisations need to address the barrier that the cost of access implies for the dissemination of standards
- The European Commission needs to consider together with the standards bodies how to improve the usage of available funding for translations
- The standards organisations, together with IPR owners, need to pursue an active IPR policy which allows not only the transfer of valuable knowledge to standards, but also their wide adoption and implementation
- The standards organisations, together with business/SME associations and other interested parties, need to consider how to increase their role in facilitating the implementation and usage of standards, and in achieving interoperability.

Standardization is a key part of the microeconomic infrastructure: it can enable innovation and act as a barrier to undesirable outcomes. One important aim of standardization is to help create a strong, open, and well-organised technological infrastructure that will serve as a foundation for innovation-led growth. It is often asked whether, on balance, standardization acts more to constrain innovation or to enable innovation. These two activities are inextricably linked. Standardization does constrain activities but in doing so creates an infrastructure for subsequent innovation. Well-designed standards should be able to reduce undesirable outcomes. Moreover, standardization is not just about producing norms for given technologies in given markets. Standardization helps to credibility, focus and critical mass in markets for new technologies.

5) *SMEs impact*

Companies that make the most of standardization opportunities enjoy a head-start over their rivals. They can reduce costs and increase quality. They can reduce the risks they face - both technological risks and market risks. Standards can help to develop the market for products and services based on the newest technologies. Moreover, there are benefits from participating in the standardization process as well as in using the end results.

Standardization increases competition and that does not necessarily increase profitability of all companies. However it is in the interests of the economy as a whole. By opening up markets and enabling competition, standards do not necessarily increase the profitability of all companies. On the contrary, open standards may actually reduce profitability. But there is a strong presumption that the customer benefits from this increased competition. Standardization increases the volume of trade, increasing imports as well as exports, and makes an important contribution to macroeconomic growth.

B. EU Aid Programs Challenges

The development of new EuropeAid and Twinning programs regarding Quality Infrastructures (QIs) have to consider that they have to correlate social, business, economic and performance issues and provide the need for a strategic QI system incorporating associated challenges as presented in this paper.

The proposed National Quality Infrastructures (QIs) shall include most of the challenges addressed as far as both the common technical and regulatory approaches and elements of performance management. Benefit countries which build or expand their QI shall include in their call for tenders specifications assuring the minimum of common to EU approaches and new elements discussed in this study.

Summarizing the conclusions, we discussed:

1. Identification of Quality Infrastructures Challenges for the countries discussed:
 - Orientation (Centrally planned against Market driven);
 - National Policies to support smooth QI development;
 - Education in Standardization initiatives;
 - Adoption of the Knowledge Triangle governance model in innovative firms and the role of QI;
 - SMEs impact by competitive QI National Systems (role of standards and intellectual property)
2. EU Aid funded programs challenges:
 - Better design and development of the following EuropeAid and Twinning EU Calls of Interests in the field of QI by incorporating challenges discussed above



Further Research Work

A few recommendations for further research work are:

- A field study to measure the performance of QI systems over business performance in EU Neighbourhood countries;
- A literature study to evaluate initiatives in “Education in Standardization” in EU Neighbourhood countries;
- Further research on contribution of Standardization into the Knowledge Triangle initiatives along to requirements of “standardize” the Knowledge Triangle.

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