

EUROPEAN ECONOMY

Occasional Papers 129 | February 2013

Market Functioning in Network Industries -
Electronic Communications, Energy and Transport



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KC-AH-13-129-EN-N
ISBN 978-92-79-28543-1
doi: 10.2765/40736

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European Commission

Directorate-General for Economic and Financial Affairs

Market Functioning in Network Industries – Electronic Communications, Energy and Transport

Acknowledgments

This report was prepared in the Directorate-General for Economic and Financial Affairs (DG ECFIN) under the direction of Anne Bucher, Director of Structural Reforms and Competitiveness. The main contributors were Emmanuelle Maincent, Dimitri Lorenzani and Attila Eordogh. Other contributors were Mirco Tomasi and Jesus Irigoyen.

The report benefitted from comments and suggestions by Nathalie Darnaut, Isabel Grilo, Dominique Simonis in the Directorate-General for Economic and Financial Affairs as well as by Lucilla Siolli, Balazs Zorenyi, Carlos Perez Maestro, Pearse O'Donohue, Gerassimos Sofianatos, Katja Viertio, Ana Armengol Torio, Yannick Dewilde, Christian Micas in Directorate-General for Communications Networks, Content and Technology (DG CNECT), Reuben Vermeuren, Malcolm McDowell, Balazs Jozsa, in Directorate-General for Energy (DG ENER), Sandro Santamato, Frank Jost and Angela D'Elia in Directorate-General for Mobility and Transport (DG MOVE).

Secretarial support was provided by Vittorio Gargaro.

The opinions expressed in the paper are the sole responsibility of the authors and do not necessarily represent the views of the European Commission or DG ECFIN.

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Abbreviations

Countries

EU	European Union
AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	the Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom

Network industries and organisations (e-communications)

3G	Third Generation
4G	Fourth Generation
BEREC	Body of European Regulators of Electronic Communications
CEPT	The European Conference of Postal and Telecommunications Administrations
DAE	Digital Agenda for Europe
DSL	Digital Subscriber Line
FTTH	Fibre To The Home (NGA technology)
GSM	Global System for Mobile Communications
HSPA	High-Speed Packet Access
ICT	Information and Communication Technology
IP	Internet Protocol (address)
LAN	Local Area Network
LLU	Local Loop Unbundling
MTR	Mobile Termination Rates
NGA(N)	Next Generation Access (Networks)
NRA	National Regulatory Authorities
PSTN	Public Switched Telephone Network
RSPP	Radio Spectrum Policy Programme
SMS	Short Message Service
VoIP	Voice over Internet Protocol address
VoLTE	Voice over Long-Term Evolution protocol
WiMAX	Worldwide Interoperability for Microwave Access

Network industries and organisations (energy)

APX	Amsterdam Power Exchange
BELPEX	Belgian Power Exchange
CWE	Central Western Europe
DSO	Distribution System Operator
EEX	European Energy Exchange
EPX	European Power Exchange
ERGEG	European Regulators Group for Electricity and Gas
IPEX	Italian Power Exchange
NBP	National Balancing Point (gas)
NCG	NetConnect Germany (gas)
NPX	Nordic Power Exchange
NTC	Net Transfer Capacity
OTC	Over the Counter
TSO	Transmission System Operator
TTF	Title Transfer Capacity (gas)
Zee	Zeebrugge (gas)

Network industries and organisations (transport)

ELFAA	European Low Fares Airlines Association
ERA	European Railway Agency
ESPO	European Sea Port Organisation
PPRISM	Port Performance Indicators – Selection and Measurement

Other abbreviations

CAPEX	Capital expenditures
EBITDA	Earnings before interest, taxes, depreciation, and amortization
ECB	European Central Bank
GDP	Gross Domestic Product
HICP	Harmonised Index of Consumer Prices
LTE	Long-Term Evolution
MPI	Market Performance Indicator
PPP	Purchasing Power Parity
PSO	Public Service Obligation
PSCs	Public Service Contract
PPS	Purchasing Power Standards
SME	Small Medium Enterprise
SOEs	State-Owned Enterprises
TFP	Total Factor Productivity

Graph/table unit

Dwt	Deadweight tonnage (ship)
Gbps	Gigabit per second
GHz	Giga-Hertz
GJ	Gigajoule
Grw	Gross registered tons (ship)
Kpbs	Kilobit per second
Kwh	Kilowatt hour
lhs	Left hand scale
Mbps	Megabit per second
MHz	Mega-Hertz
MWh	Megawatt hour
Pkm	Passenger-kilometres
rhs	Right hand scale
Tkm	Tonne-kilometres

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Executive Summary

The objective of this report is to assess the state of play of market opening in electronic communications, energy, and transport¹. One of the main objectives of the liberalisation efforts in network industries has been to bring prices for consumers as close as possible to market prices. This should provide an efficient allocation of resources in the economy, avoid rent-seeking positions, and contribute to delivering diversified choices and an increased quality of services to consumers. In addition, market integration should bring about more homogenous price levels for the same kind of services, creating a level playing field for businesses and citizens across the EU. In 2010, the report on the Internal Market prepared by Mario Monti stated that network industries are among the least integrated segments of the Single Market², mainly due to belated regulations, delayed implementation, and weak enforcement. This is also due to the fact that changes in network industries require long adaptation time and are often dependent on the availability of expensive technologies and infrastructures.

Network industries are generally characterised by high fixed and sunk costs, justifying that some segments, exhibiting features of natural monopolies, are regulated by a sectoral authority. This poses a challenge to regulatory authorities, as the regulatory framework has to ensure competition and non-discriminatory access to the regulatory parts while providing enough incentives for companies to invest in the network. The effective functioning of the market in network industries is even more important because preliminary estimates point to investment needs in broadband, electricity, gas, and transport of between €1.5 trillion and €2 trillion in the EU³.

Beyond their economic importance, these industries interact with the rest of the economy, including in terms of policies, which makes their market functioning a key issue. Improving the efficiency of these sectors will translate into greater energy security, smaller trade imbalances, climate change mitigation and higher market integration. Despite the development of a strong EU legislation body over the past decades, a single market has not yet been achieved in these network industries and some sectors are still sheltered from competition. Moreover, energy and transport are still characterised by strong State intervention, which can sometimes lead to distortions.

The assessment of sector-specific market functioning is provided in annexes I, II, and III. In conclusion, all the network sectors have been reshaped by regulatory reforms over the past two decades, but, despite the presence of a strong EU legislative body, the degree of competition and market conditions vary significantly across countries and across network industries. This is reflected in the still high dispersion in prices and concentration.

1 E-communications include the following carrier services: i) fixed voice telephony and Internet access and services, ii) mobile voice telephony and data services, iii) business data services, iv) pay TV. Energy includes electricity and gas. Transport includes road, rail, ports, and air.

2 Monti (2010).

3 COM(2011)276 final.

1. INTRODUCTION

There are several reasons why the assessment of market functioning in network industries⁴ is relevant.

Network industries are crucial in the modern economy: their economic relevance goes well beyond their being sizeable sectors *per se*, as it encompasses the strategic complementarities they exert over the whole productive system. In particular, e-communications, energy, and transport represent key network industries regulated at the EU level. In fact, they account together for some 9% of value added, 6% of employment, and 11% of households' purchases in the EU. However, their economic importance is much broader because of their key role as inputs/enablers for all other economic and social activities. For this reason, the price and quality of their outputs are essential for the growth and competitiveness of European industries, for the well-functioning of the internal market, and for the standard of living of European consumers. In addition, the inter-linkages of these network industries with the rest of the economy have consequences for policy action, since their regulation interacts with other EU policies. For instance, e-communications provide the crucial infrastructure for the progress towards a genuine knowledge economy, with technological developments and capital deepening therein stimulating innovation and translating into productivity gains also in more traditional sectors. Likewise, transport and energy are among the main determinants of oil dependency and greenhouse gas emissions: greater efficiency in these sectors translates into greater energy security, smaller trade imbalances and climate change mitigation.

These industries are intrinsically characterized by the co-existence of competitive and regulated segments with natural monopolies, sunk costs, and economies of scale due to the crucial role played by the underlying infrastructure. Given the economic costs associated with monopolistic rents, these sectors have thus been reshaped by major regulatory reforms over the past two decades, mainly in order to promote competition and safeguard consumers' rights. Another characteristic of network industries is the role of the State, which has to ensure the provision of measures to satisfy public service obligations/universal services. In energy and transport, public intervention can also take the form of state-ownership and/or end-user price regulation. Overall, pursuing the market opening of these industries could make a key contribution to the success of Europe 2020.

For all these reasons, it is important to look at the market functioning of these network industries, as the impact of any distortions can go beyond these sectors and negatively affect the economy at large, including in terms of competitiveness and growth.

2. ROLE OF NETWORK INDUSTRIES IN THE ECONOMY

E-communications, energy, and transport activities are key variables in the economy. E-communications are becoming increasingly essential inputs/facilitators throughout the value chain: a vast literature shows their positive influence on productivity and growth, and, for example, the absence of broadband may nowadays even impede the provision/export of specific services. Energy prices are a significant cost element for business, and energy bills represent an important item of the household budget. Transport is the backbone of business activity; linking the different stages of production, allowing service industries to reach their clients, as well as being a significant employer in its own right. Moreover, their interaction with other important EU policies, in particular the Climate and Energy agenda, makes their market functioning a key issue.

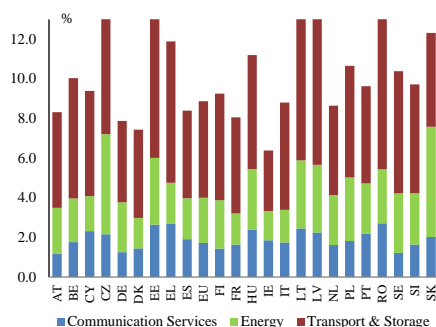
⁴ The network industries under scrutiny are energy (electricity and gas), transport (road, rail, ports, and air), and electronic communications, including: i) fixed telephony and internet access and services, ii) mobile telephony and data services, iii) business data services, iv) pay TV. This broad definition that reflects increased network convergence, is in line with European Commission (2012b) and close both to the "wireline, wireless, satellite and other telecommunication activities" under the NACE Rev2 category J61 of Eurostat and to the basket of "telephone and telefax services" used to compute the HICP index (with, on top of traditional telephony, information transmission and internet services).

2.1. ECONOMIC WEIGHT

2.1.1. Share in the economy

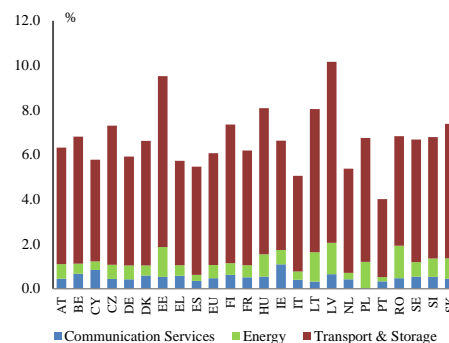
As of 2009, e-communications, energy and transport activities accounted together for 8.9% of the value added and 6.1% of the employment in EU27 (Graphs 1a and 1b). These shares vary significantly across countries, with relative shares generally higher in new Member States.

Graph 1a: Share of e-communications, energy, and transport in gross value added (2009)



Source: Eurostat, National Accounts.

Graph 1b: Share of e-communications, energy, and transport in employment (2009)

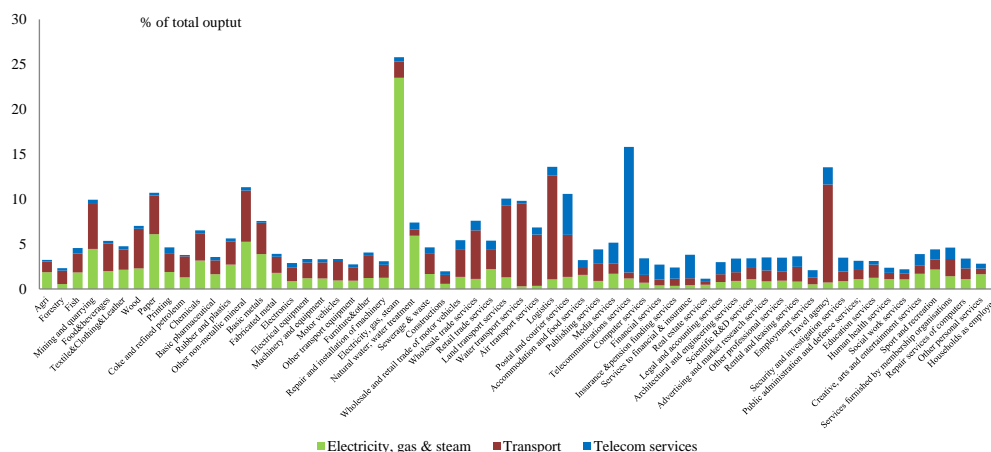


Source: Eurostat, National Accounts

2.1.2. Share in business' costs

E-communications, energy, and transport are important inputs in the production process, and their price can influence the cost competitiveness of other sectors of the economy. While the share of energy and transport is more important in manufacturing products' costs, in particular in energy-intensive industries (mining and quarrying, basic metals, non-metallic products, chemicals), e-communications' costs account for a higher share in services' costs, in particular in ICT services (see Graph 2.a).

Graph 2.a: Share of e-communications, energy, and transport in the cost structure of branches – EU27 (2008)

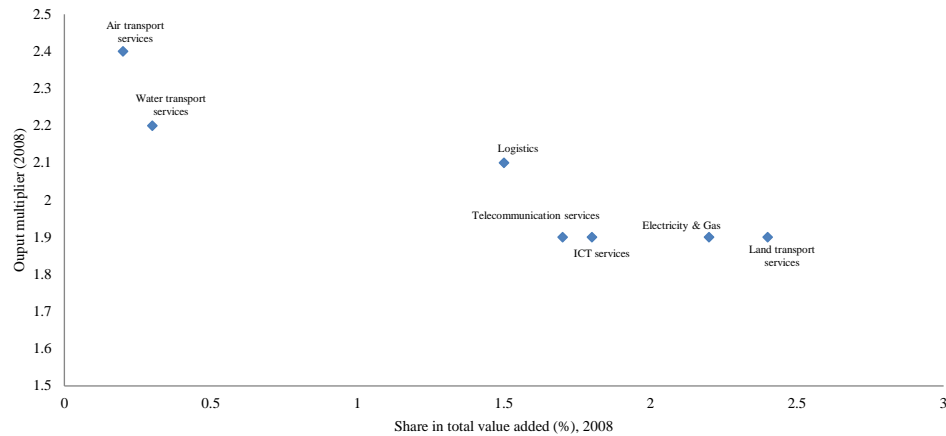


Source: Eurostat, input-output tables.

Another way to look at the importance of network industries in the economy is to look at their interrelations with the other sectors of the economy and how a change in the final demand to these sectors impacts on the rest of the economy. In all cases, their output multipliers⁵ are equal or above the median economy-wide multiplier (1.9), which hints at the strong inter-linkages that these sectors have with the rest of the economy. This is observed in particular in air transport (multiplier of 2.4) and water transport (multiplier of 2.2), as well as in further related services, having even higher shares in value added, like logistics (Graph 2.b).

⁵ The output multiplier of a sector measures the direct and indirect output changes induced by the direct output change due to a unit increase in the sectoral final demand.

Graph 2.b: Output multipliers and Share in total value added



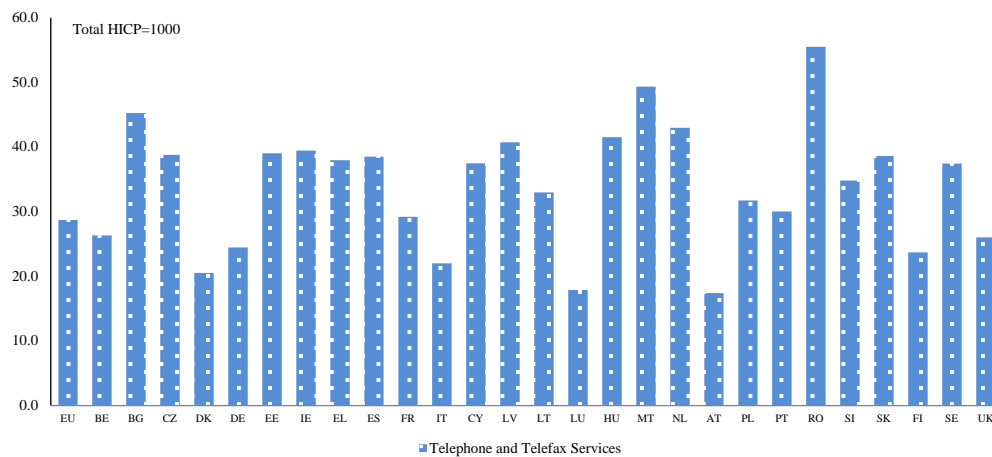
Source: calculated from Eurostat, input-output tables

2.1.3. Share in household's purchases

Based on COICOP weights in 2011, at the average EU level households dedicate **2.9% of their purchases to e-communications, 5.9% to energy, and 2.4% to transport services**. However, households spend much more on their individual transport mode: purchase of vehicles and operation of personal transport equipment account for 12.7% of their purchases⁶. In transport services, road services accounts for the highest share of expenditure in the majority of Member States, followed by air transport and railways.

The weights of e-communications, energy, and transport service prices vary considerably across countries (see Graphs 3a, 3b, and 3c). In general, due to lower income, the energy share in HICP is higher in new Member States, mostly due to the higher share of gas, electricity, and heating in total expenditure. The same pattern for e-communications, instead, may be due to a combination of this issue with higher prices due to less advanced liberalisation and different consumption profiles therein, including the take-up of bundled services.

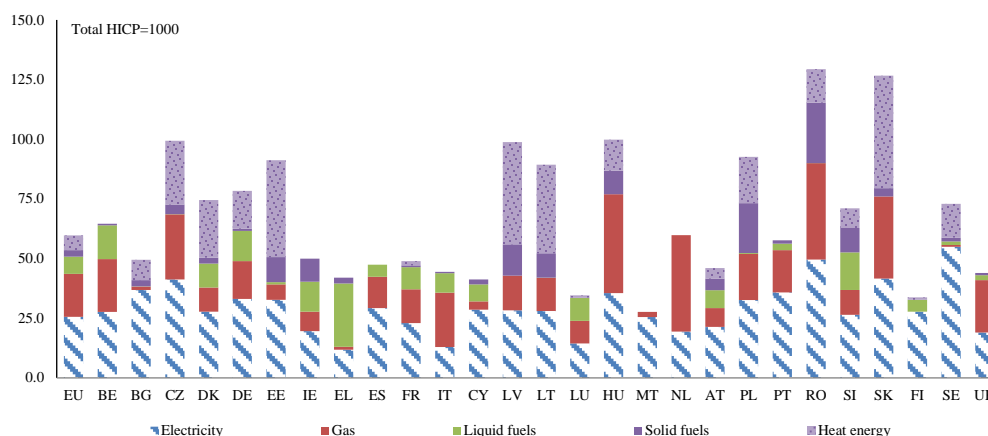
Graph 3a: Weight of e-communications in HICP – 2011



Source: Eurostat, HICP.

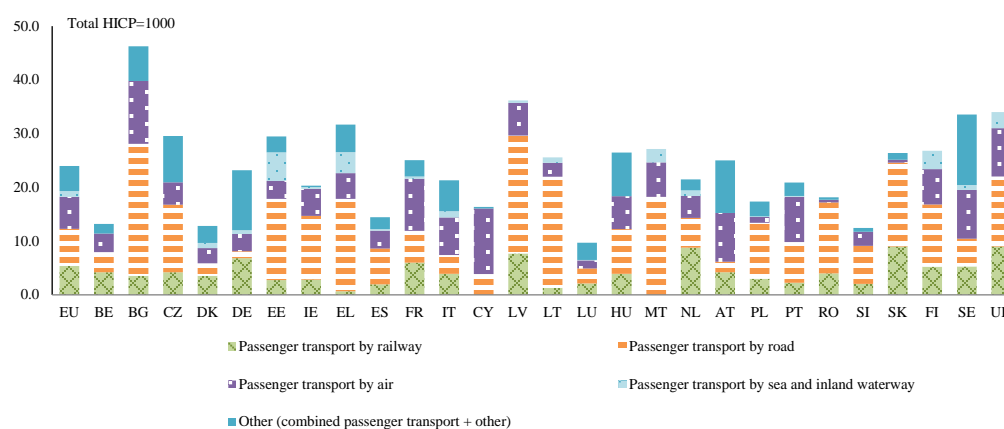
⁶ Arguably, the improvement in the functioning of transport services could shift households' purchases from individual vehicles to transport services.

Graph 3b: Weight of energy in HICP – 2011



Source: Eurostat, HICP.

Graph 3c: Weight of transport services in HICP – 2011



Source: Eurostat, HICP.

2.2. HICP PRICE EVOLUTION

The price evolution in e-communications, energy, and transport is determined by intrinsic features such as technological changes and competitive pressures, and also by national (geography, topology of legacy infrastructure) and international factors (commodity prices) factors. In contrast with the prevailing trend in overall HICP, **prices of e-communications services have witnessed, on average, a decrease** by some 1% p.a. since 2006 (see Table 4 in Section 5), although with marked differences among Member States and segments: for instance, EU-wide retail prices for the most competitive mobile voice services fell by 31-46% for all usage patterns between 2006 and 2010⁷. **On average, e-communications prices have witnessed a yearly decrease** by some 1% since 2006, with marked differences among Member States and against the prevailing upward trend in the overall HICP (see Table 4 in Section 5). Instead, **energy and transport prices have been above inflation**.

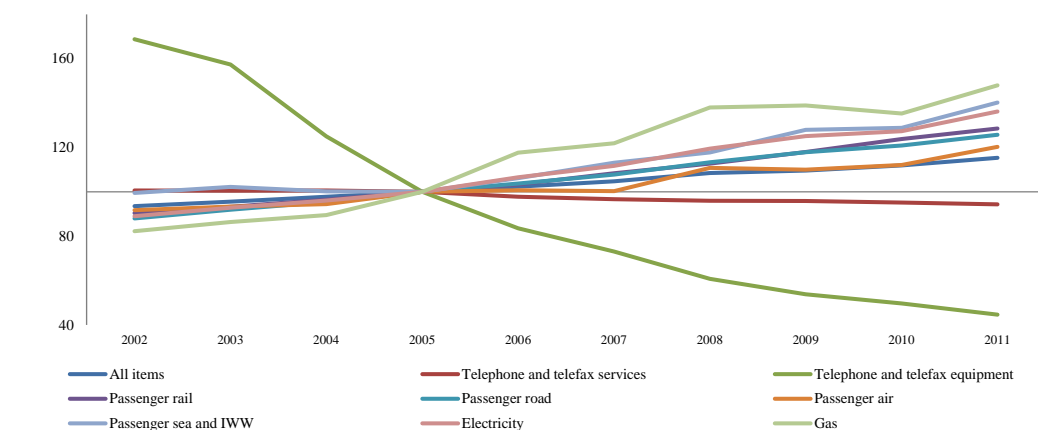
In greater detail (see Graph 4), over the past decade gas prices displayed a sustained increase, explained, among other factors, by the evolution of oil prices. In comparison, electricity prices increased at a slightly slower pace. More specifically, the impact of oil prices on electricity and gas varies across Member States, as it depends on their electricity and overall energy mix, the share of the transport and petrochemical industries in the economy, as well as their method of gas pricing (as pipeline gas pricing implies links to oil prices). In general, energy inflation has contributed to recent price dynamics given the increase in

commodity (oil) prices in 2008-early 2009 followed by a decrease in 2009⁸. Finally, while generally deregulation is expected to lower prices, it is not excluded that in some countries, the on-going/foreseen electricity and gas price deregulation could lead to inflationary pressures, in particular in countries where a catching up effect would take place. At the same time, gas and electricity price deregulation is likely to lead to improvements in the quality of services, as this process might attract new entrants and enhance competition (see annex II on energy). The assessment of the overall effect would require further analysis.

In transport services, price increases have been above total inflation. The increases in prices of passenger sea services, followed by railways, have been the highest compared to road and air transport services.

As for e-communications services, the contribution to HICP has been negative at the EU level (-0.71% p.a. over 2002-2011), particularly between 2006 and 2008, but less than in the Euro area (-1% p.a.)⁹. This downward trend is consistent with the much more marked one (-13.7% p.a. over 2002-2011) in e-communications equipment and in contrast with the positive contribution to inflation of postal services (+2.7% p.a. over 2002-2011).

Graph 4: HICP evolution in network industries- 2002-2011



Source: Eurostat, HICP.

2.3. INTERACTIONS WITH OTHER EU POLICIES

2.3.1. E-communications, users' rights and Digital Agenda

E-communications raise crucial regulatory issues in terms of users' rights, including privacy, security, and more and more the issue of universal access, precisely in light of their role of *condicio sine qua non* for the progress towards a genuine knowledge economy. In fact, with the technological progress shaped by the Internet, their function of essential facilitators throughout the value chain and the positive spillovers they exert over all other sectors have implied, on the one hand, that data protection and network security should be ensured through adequate infrastructure and fostered by favourable regulation thereon; on the other hand, that the concept of universal service obligations has aimed to bridge digital divides, i.e. guaranteeing that rural or remote areas and low-income citizens can be provided with access to affordable services that are essential to participate to any economic and social interaction.

Therefore, safeguarding users' rights in e-communications is closely related to ensuring adequate investments and fostering innovation in an increasingly globalized and interconnected world, not least through public support¹⁰. In fact, the *Digital Agenda for Europe* sets three ambitious targets, whereby all Europeans should have access to basic broadband (with speed between 144 Kbps and 2 Mbps) by 2013 and to fast broadband (at least 30 Mbps) by 2020, while take-up of ultra-fast broadband (at least 100 Mbps) by European households should reach at least 50% by 2020. Moreover, since private investments in

⁸ The pass-through of e-communications, energy and transport price evolution to HICP depends mainly on two factors, i.e. their weight in the HICP and the inflation rate at national level. For instance, given the higher weight of energy, its price variations might have a stronger impact than e-communications ones. For example, according to Commission Services estimates on the pass through between oil price and headline inflation, an increase of the crude oil price by 1€ increases headline inflation by 6 basis points in the euro area as a whole.

⁹ This reflects an upward trend in some new Member States such as Romania (+4.3% p.a. over 2002-2011) and Czech Republic (+1.4% p.a. over 2002-2011), but also, to a minor extent, Bulgaria, Slovenia, and Slovakia.

¹⁰ For further insight, see also to annex I on eComms, section 2.3.

broadband, namely in new generation access (NGA) networks, have so far fallen short the effort required to meet these objectives, the role of public support to promote efficient investment and innovation in enhanced infrastructure is being considered in the on-going revision of EU guidelines on State aid to broadband.

Overall, this has been a key objective of the EU growth and competitiveness agenda at least since the 2000 Lisbon Strategy, underpinned by the awareness of the contribution that an integrated approach to e-communications could make to stimulating innovation, competitiveness, and ultimately growth in the EU, first and foremost by contributing to the achievement of a genuine internal market for e-communications.

2.3.2. The interaction of e-communications with other network industries

Another issue is the role of e-communications as a platform for the creation of new market and services and the increase of safety and efficiency in as diverse areas as public administration, health, education, and other network industries. In particular, **ICT can contribute to improving the efficiency of transport and energy through better information flows and more adequate pricing.**

In transport, intelligent transport systems (ITS) aim to provide innovative services relating to different modes of transport, to enable individual actors and components within the transport system (users, vehicles, roads, traffic lights, message signs, etc.) to become informed by having access to relevant traffic-related information, and to empower them to better communicate with each other with a view to achieving safer, more coordinated and more efficient use of transport networks¹¹. This shows the potential of ICT to contribute to delivering increased safety, improved operational performance (particularly by reducing congestion), enhanced mobility and convenience, environmental benefits, and increased productivity.

In energy, the introduction of smart grids and smart metering contributes to the decarbonisation of the power system. Smart grids can be defined as "an upgraded electricity network to which two-way digital communication between supplier and consumer, intelligent metering and monitoring systems have been added"¹². Through improved information flows, consumers are able to manage (and control) their own energy consumption pattern and receive incentives to improve the efficiency of their energy use, in particular if smart grids are combined with adequate pricing (time dependent pricing). Until now, the deployment of smart grids has been limited, and there are still several challenges that have been identified and acknowledged by the EU – the development of technical standards; the need to ensure data protection for consumers, the establishment of a regulatory framework to provide incentives for smart grid deployment; the need to guarantee an open and competitive retail market; and the continued support of innovation in technology and systems¹³.

2.3.3. The contribution of energy and transport to the Climate agenda

Energy and transport account for half of total greenhouse gas emissions (respectively 30% and 20% in 2009). They are key CO₂ emitters although progress has been made over the past years. For some countries, the CO₂ intensity is an important challenge¹⁴, especially in view of the "20" target set by the EU. Transport activities make a significant and growing contribution to climate change; their greenhouse gas emissions have increased by 22% between 1990 and 2009 while the energy industries have seen their emissions reduced by 16% during the same period¹⁵.

The Climate and Energy agenda, which aims to internalise the CO₂ external costs, is likely to lead to higher prices in the forthcoming years. The scope for these price increases will depend, among other things, on the carbon price set on the EU carbon market and the possibility to pass them through onto consumers. Well-functioning energy and transport markets can help address these challenges in an efficient way.

¹¹ ITS includes a wide and growing suite of technologies and applications but ITS applications can be grouped into the following main categories: (1) Advanced Traveller Information Systems; (2) Advanced Transportation Management Systems; (3) ITS-Enabled Transportation Pricing Systems; (4) Advanced Public Transportation Systems; (5) Fully integrated intelligent transportation systems. See Ezell, (2010).

¹² COM(2011)202 final.

¹³ COM(2011)202 final.

¹⁴ See European Commission's forthcoming publication on energy dependence which provides, among other things, indicators on CO₂ intensity of the economy.

¹⁵ Eurostat.

3. REGULATORY FRAMEWORK OF NETWORK INDUSTRIES

Network industries provide **services** through a **network infrastructure**. The network infrastructure is often considered as a natural monopoly subject to regulation, while services are subject to competition. For this reason, there are several aspects to look at when assessing competition in network industries: ex-ante regulation framed by EU legislation, other State intervention, as these sectors are very often considered strategic¹⁶, and ex-post competition enforcement.

3.1. CHARACTERISTICS OF NETWORK INDUSTRIES: REGULATION AND COMPETITION

Most network industries share common characteristics. On the one hand, the infrastructure segment displays features of **natural monopoly** (high sunk costs and non-duplicable network) and is thus usually subject to regulation on pricing and access to the network. This applies to the transmission and distribution networks in e-communications (backbone, backhaul and last mile), energy, and transport infrastructures (road, rail, ports and airports). On the other hand, as long as each operator gets a fair and transparent access to the infrastructure, **competition** can be ensured in service provision. The co-existence of regulated and competitive segments requires them to be coordinated and regulated by a strong and independent regulator. Finally, as network industries fulfil basic needs –communication, energy, and mobility–, they have to deliver a universal service in cases where the market is unable to do so (due to the presence of remote areas, vulnerable consumers, etc.).

Despite these common features, **each network industry has its own characteristics and specificities**. Fundamentally, network industries face different challenges. For instance, while e-communications, electricity, gas, railway, and air transport are more capital intensive, road transport remains labour-intensive: for this reason, market opening therein includes social considerations that are more prominent than in other sectors (see annex III). Moreover, until now, technological and innovation developments have been different across networks.

In e-communications, path-dependences and technological developments raise crucial issues in terms of platform competition (see annex I, *Box I.1*). On top of this, significant impetus to infrastructural deployment has been provided by the Digital Agenda broadband targets. Yet, an open debate regards the speed and scope of the on-going migration to next generation access (NGA) networks, and namely whether the sector is fit and ready for this change, and how the EU and national regulators can contribute to it¹⁷.

In contrast with eComms, transport and energy have witnessed rather limited innovation and technologies, but their role could be crucial in the near future, in view of the need to enhance efficient use of energy and transport services. These sectors are also shaped by the climate change challenge and the EU 2020 targets, having to reduce their greenhouse gas emissions. The power and aviation sectors are part of the ETS (emission trading scheme), while carbon tax is included in excise fuel duties in road transport. Discussions on whether to include the maritime sector in the ETS are on-going at the international level. Finally, the foreign dimension and security of supply are crucial concerns in the energy sector, in particular in countries that are heavily energy import-dependent.

More generally, network industries face increasing demand elasticity over time and their products tend to be either complements or substitutes, although with different degrees of homogeneity. For example, eComms services provided over competing Internet platforms (e.g. DSL and cable) like *Voice over IP* and instant messaging are increasingly complementing traditional fixed or mobile telephony at the local level and substituting them in the case of trunk calls; gas and electricity are interdependent, as gas can be used as an input in electricity production. In transport, road and rail can compete on short and long distances, but different transport modes (ports and road/rail) can also complement each other. In other words, inefficiencies in one market might influence the functioning of the other markets. Table 1 summarises the common features of these sectors¹⁸.

¹⁶ Gerardin (2006) refers to economic patriotism. See also Buigues and Meiklejohn (2011).

¹⁷ An example is the forthcoming initiative to reduce the costs of rolling out high-speed Internet networks (COM(2012)573 final, page 13). Since most of these consist in civil engineering and can be imputed to inefficiencies in the deployment process, the initiative will aim at implementing, among other measures, more intensive use of existing passive infrastructure, cooperation with utility companies, and improved coordination of all actors involved in the roll-out.

¹⁸ Characteristics of electricity and gas taken from Röller *et al.* (2006). See also Buigues and Meiklejohn (2011).

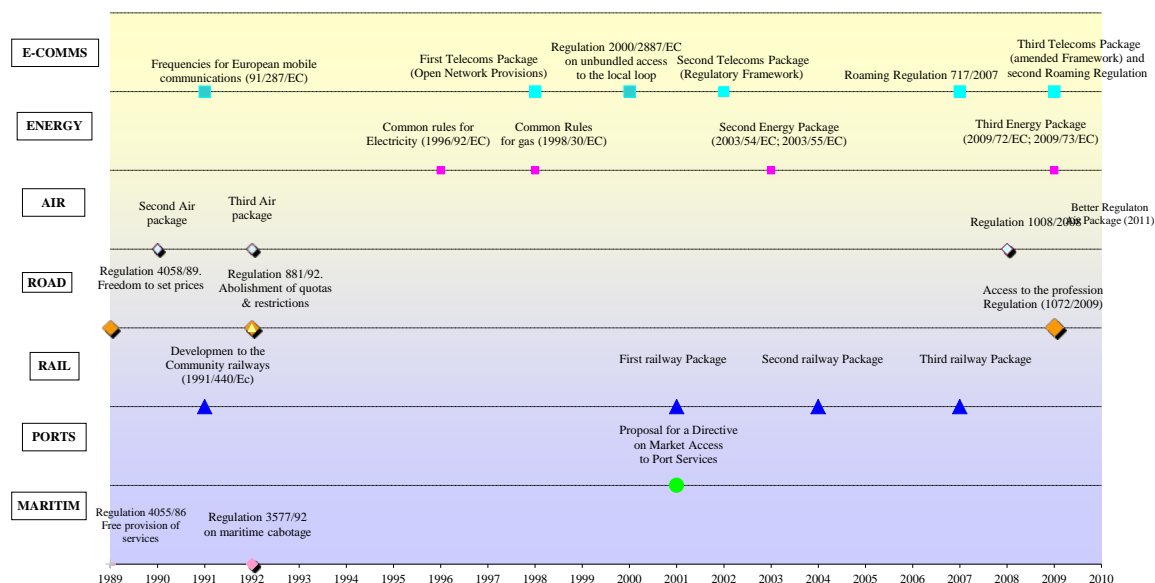
Table 1: Features of network industries

	Communications	Gas	Electricity	Rail	Road	Air	Maritime
Product Homogeneity	Low-medium (within segments)	High	High, but lower intertemporal due to non-storability	High	High	High	High
Demand elasticity	Medium in the short term, higher in the longer term	Short term: low Long term: medium (main substitute: natural resources)	Short term: low Long term: medium (main substitute: natural resources)	Short term: medium (competition with road) Long term: higher (competition with other modes)	Short term: low Long term: higher (competition with other modes)	Short term: medium Long term: medium (competition with other modes)	Short term: low Long term: medium (competition with other modes)
Investment in network	Costly and Sunk, but lighter at service provision level (e.g., mobile virtual network operators)	Costly and Sunk	Costly and Sunk	Costly and Sunk	Costly and Sunk	Costly and Sunk	Costly and Sunk
Physical characteristics of infrastructure	Long-distance for backbone, medium-distance for wireless, and short-distance for last mile	Long distance. Physical network	Medium distance. Physical network.	Long and short distance. Physical network	Long and short distance. Physical network	Long and medium distance. Physical network	Long and short distance. Physical network
Foreign dimension	Important for backbone	Important	Of relevance only indirectly	Of relevance only indirectly	Of relevance only indirectly	Of relevance only indirectly	Of relevance only indirectly
Public service Obligation	USO for: i) public telephone network at a fixed location, including voice, facsimile, and data communications allowing functional Internet access; ii) special measures for the disabled	Last resort supplier	Last resort supplier	Widespread use of PSOs. Often awarded directly (exception in EU legislation)	Yes, through competitive tendering.	Infrequently	For islands
Separation of infrastructure and services	NRAs' remedies include transparency, non-discrimination, accounting separation, access requirements (including price control) and functional separation of SMP vertically integrated operators	Unbundling (full ownership unbundling, legal unbundling)	Unbundling (full ownership unbundling, legal unbundling)	Independence of Infrastructure manager	n.a.	n.a.	n.a.
Infrastructure Charging for third party access	For LLU: bottom-up long-run incremental cost (pure LRIC)	n.a.	n.a.	Marginal cost charging	Significant variances but where users are charged, usually based on average cost	n.a.	n.a.
CO2 cost	n.a.	ETS	ETS	Possible if done in other modes	Fuel tax (not explicitly though)	ETS	In discussion to be included in ETS

3.2. EX-ANTE REGULATION: HETEROGENEITY ACROSS NETWORK INDUSTRIES

Since the 1980-90s, network industries have been reshaped by regulatory reforms in the EU. These reforms aim to put an end to the monopoly situation of network industries and open these markets to competition, including to other EU companies in order to achieve the internal market. However, **the pace of market opening has not been the same across network industries and, twenty years later, EU requirements still vary across sectors**¹⁹. Graph 5 provides the main steps since 1990 of the EU legislation concerning e-communications, energy, rail, maritime, road, and air transports. It shows that most of the EU legislation in network industries has been refined at least since 2002, building on the implementation of past legislation and going further (see *Box 1*).

Graph 5: Ex ante Regulation: Evolution of EU acquis in network industries



Source: Commission Services.

BOX 1: EU EX-ANTE REGULATORY FRAMEWORK IN E-COMMUNICATION, ENERGY AND TRANSPORT

The liberalisation process in **e-communications** began in 1998 with the "First Telecoms Package", aimed to foster sustainable competitive conditions in the national markets by means of heavy regulation, e.g. on access through the so-called "open network provisions", on universal service obligations, and on National Regulatory Authority's (NRA) remedies to be imposed in case of incumbent operators' "significant market power" (SMP), defined as the ability to act independently of competitors, customers, and consumers. These direct intervention powers by the national regulators in implementing the EU Framework within insufficiently competitive eComms markets, namely protecting entrants and final users against dominant operators through adequate regulatory obligations, has been a constant and evolving feature of the industry. In fact, the 2002 "Second Telecoms Package", laying more emphasis on concepts and practices of competition policy including adequate access to the existing fixed infrastructure and technological neutrality, empowered the Commission to identify 18 "relevant" markets where ineffective competition could be traced and remedies imposed by NRAs, such as price regulation on the undertaking identified as having SMP. In so doing NRAs were encouraged to proportionately apply the "ladder of investment" principle, ensuring market entries at any level of the telecom value chain and incentivising operators to build their own infrastructure to the benefit of sustainable inter-platform competition (see *Box 1.2* in annex I). The 2009 "Third Telecoms Package" amended the 2002 one towards enhanced regulatory coordination at the EU level, aimed to further harmonise national regulations under stronger competition principles with respect to the previous rules. In fact, a Body of European Regulators for Electronic Communications (BEREC)²⁰ was created, and NRAs' competences were broadened by including functional separation (i.e. separation of wholesale and retail lines of business management under a same ownership in case of enduring access problems to the incumbent operators' network) among possible remedies to ensure better competition in the relevant markets, reduced to 7 in December 2007 due to advances in competition²¹. It is worth noting that, before

19 The same heterogeneity is observed across transport modes. See Finger M. and R. Künneke (2011),

20 Still, BEREC has no legal personality or status of EU Agency. See, e.g., Pelkmans and Renda (2011)

21 In fact, the Commission is empowered to revise its *Recommendation on relevant product and services markets* for eComms: the current version, dating back to 2007 (a public consultation IP/12/1105 was launched in October 2012 to update it), includes the following markets where potentially ineffective competition should be analysed by NRAs: 1) access to the fixed telephone network; 2) call origination on the fixed telephone networks; 3) call termination on individual fixed telephone networks; 4) wholesale access to the local loop; 5) wholesale broadband access; 6) wholesale terminating segments of leased lines; 7) voice call termination on individual mobile networks. This does not preclude regulation in other segments, if NRAs trace inadequate competition therein

adopting remedies, NRAs must submit them to the Commission under the so-called Article 7 procedure, and take into utmost account subsequent remarks. On top of this, the Framework empowers the Commission to issue recommendations where it finds that divergences in the NRAs' implementation of their regulatory tasks may create a barrier to the internal market: NRAs must take utmost account of such recommendations. The EU-level spectrum management competences were also enhanced, as increased reliance on spectrum-hungry technologies like mobile broadband fostered the debate on the EU regulator's stance on the allocation of scarce radio spectrum frequencies, mainly the *digital dividend* freed by the switching off of analogue emissions by 2012. This more coordinated regulatory approach was also reflected by further regulatory measures including the EU-wide price control introduced through the 2009 Roaming Regulation²² and, beyond e-communications, the May 2010 *Digital Agenda for Europe*, which indicates ambitious measures to achieve a Digital Single Market, like: i) a EU Radio Spectrum Policy Programme that was approved in 2012²³; ii) pan-EU licensing for on-line rights management; iii) stronger data protection; iv) updating the e-commerce and e-signature Directives to realise EU-wide e-identification, e-authorization, and online dispute resolution; v) harmonised numbering to enable EU-wide provision of business-services; vi) adequate support to investments in NGA, including LTE wireless broadband.

In **energy**, the liberalisation process has been launched in the mid-90s to enable all consumers to benefit fully from competition and fair prices. The sectoral enquiry on energy carried out by the Commission in 2005 identified major competition problems requiring further market opening initiatives²⁴. Following the enquiry, one of the key steps has been the recent Third legislative Energy Package proposed in 2009, which applies to both electricity and gas²⁵. Its main elements are the strengthening of regulators, the requirement for effective separation of the transmission networks' operation from supply and generation activities (unbundling), and certain requirements related to network cooperation, consumer rights, transparency, and access to transmission networks, gas storage and LNG (liquefied natural gas) facilities. The transposition and implementation of the Third Energy Package has consequences for energy producers, suppliers and transporters, as well as final consumers. This should translate into increased competition on the wholesale and retail markets, and where necessary, into new investments in energy infrastructure to transport, distribute and store electricity and gas to the benefit of the final customer. At this stage, a number of Member States have not yet notified measures which fully transpose the Directives; hence, the non-transposition infringement proceedings opened by the Commission are on-going.

In **transport**, the degree of market opening varies across modes. In **railways**, the EU has been pursuing a policy of market opening aimed at introducing competition between rail operators over the same rail infrastructure. The process of market opening has started in the freight segment and more recently extended to the international passenger segment. The transposition of the existing railways packages should translate into increased competition in the freight and passenger segments and independent infrastructure managers. In this respect, the recast of the first railway package is expected to improve transparency of the rail market access conditions and to strengthen the independence of national rail regulators. But, EU legislation still exempts railways from competitive procedures for the awarding of contracts with public service obligations. In addition, regarding the relationship between infrastructure managers and railway undertakings, existing separation requirements do not prevent conflicts of interest. There is discrimination potential from functions that are not defined as essential functions in current legislation. The Fourth Package will address these problems, along with other problems identified in the governance of infrastructure managers. In **maritime transport**, the freedom to provide maritime transport services entitles nationals of EU countries to transport passengers and goods by sea from any port in any EU country to any port in any other EU or third country. National restrictions reserving the transport of certain goods to vessels flying the national flag have been removed. Ship operators registered in one Member State are allowed to provide maritime transport services within another Member State (the so-called maritime cabotage) on a temporary basis and under the same terms and conditions as those applied by the Member State in question to its own nationals. However, maritime transport is still subject to custom controls, even in the case of intra-EU transport. In other words, there is no free circulation for goods transported at sea, which implies considerable additional costs to the operators. In **ports**, the EU legislation is less developed. There is no EU legislation directly regulating market access to port services, as the Commission's proposal for a Directive was rejected by the European Parliament in 2005, and the 2007 Communication on ports policy is based on soft law measures and best practices. The issue is complicated further by a lack of sufficient transparency regarding the funds that public authorities make available to their ports. This can have a distortive effect on inter-port competition and may also represent an undue burden on public finances. By contrast, the **road freight transport** has enjoyed a successful market opening since more than two decades. Before the start of the liberalisation process international road freight transport was subject to strict quotas negotiated bilaterally between pairs of Member States with various types of tariff controls in place. The progressive liberalisation of the European road haulage industry took place over a period of 15 years between 1983 and 1998 for cross-border traffic. The most recent change in the relevant EU legislation took place in December 2009. The objective of the new regulation was to increase the integration of the road transport market, improve the efficiency of road haulage operations, and create a level playing field for operators by eliminating the uncertainties associated with possible differing national interpretations of the applicable cabotage rules. The new rules entitle any operator to carry

22 The Regulation 717/2007, amended in 2009 and then in 2012, aims to increase competition in roaming on public mobile telephone networks, by introducing information obligations to prevent data roaming bill shocks and caps on intra-EU roaming charges for all consumers not opting for alternative offers: i) for calls made (29 cents excluding VAT) and received (8 cents), also called Eurotariff; ii) for SMS sent (9 cents), also called Euro-SMS tariff; iii) for data roaming (70 cents/MB), also Euro-data tariff.

23 The RSPP aims to ensure sufficient spectrum for mobile broadband by fostering shared use of wireless technologies and freeing additional resources without compromising incumbent license holders' rights. In fact, new technologies allow sharing licence-exempt bands and providing broadband services in "white spaces" in-between TV frequencies, but national regulations mostly fail to reflect them: the Commission thus calls for NRAs to monitor and potentially extend the internal market for licence-exempt bands, and foster a consistent EU-wide regulatory approach for shared rights of use.

24 Sector inquiry pursuant to Article 17 of Regulation 1/2003 EC in the European electricity and gas markets. COMP/B-1/39172 (electricity sector inquiry) and COMP/B-1/39173 (gas sector inquiry).

25 Directives 2009/72/EC and 2009/73/EC set the rules for the internal markets of electricity and gas, respectively.

out up to 3 cabotage operations within a period of 7 days after the full completion of an international transport operation²⁶; one or more of these 3 cabotage operations may be carried out in other Member States (one per Member State within 3 days from the empty entry into the territory of that Member State)²⁷. These new cabotage rules have already been applied since May 2010. Although these new rules offer some flexibility to hauliers engaged in international road freight transport to carry out domestic transport operations in other Member States across the EU, there are still some important restrictions that limit the ability of road transport operators to optimise their operations and efficiency. Specifically, the completion of an international transport operation is a pre-condition for cabotage, which *de facto* leads to restrictions on some types of operations²⁸. Another success of market opening has been the experience in the **air transport**. Before 1987 and the start of the liberalisation process, the air transport industry was highly regulated in Europe, air fares were set through bilateral agreements between states, and services could only be provided by national carriers with no real competition between them. The EU liberalised its air transport sector in three stages. In 1987, under the first package of liberalisation measures, fare restrictions were reduced and airlines were given some flexibility to share seat capacity. In 1990 the second package allowed European airlines to carry an unlimited amount of passengers and cargo between their home country and other EU countries. For intra-EU flights with stop-overs in a third country, the right to pick-up and drop-off passengers during the stopover was authorised to a greater extent. Fare and capacity restrictions were reduced further. As part of the third liberalisation package, the freedom to provide services within the EU was given to all EU airlines in 1993, together with the full freedom to set fares. Also, as a part of this package, EU airlines were granted the freedom to provide cabotage²⁹ in 1997. As a result of the creation of the single market for air transport, European airlines have practically unlimited flexibility to determine their routes, capacity, schedules and fares. In parallel with the liberalisation of air transport service provision, EU legislation has also been adopted with the aim to ensure that airlines have access to the necessary resources and **services in airports**. These include ground handling services at the airports, airport slot allocation allowing that landing and take-off slots are used efficiently and distributed in an equitable, non-discriminatory and transparent way, and a common framework for airport charges³⁰. On 1st December 2011, the European Commission adopted a comprehensive package of measures to address capacity shortage at Europe's airports and improve the quality of services offered to passengers (the so-called Better Airports Package³¹). The package contains three legislative proposals on slots, ground-handling and noise.

3.3. STATE INTERVENTION IN THE COMPETITIVE SEGMENTS

E-communications, energy, and transport are often considered strategic sectors by governments, which often entails a high level of State intervention. Compensation for public service obligations, price regulation, and public ownership of companies are the most salient features of public intervention in these sectors³¹.

3.3.1. Public Service Obligations

Public Service Obligation (PSO) is an important component of network services, which has to be operated in a transparent way.

In e-communications, the *Universal Services Directive* defines a universal service obligation (USO) whereby Member States must provide access to a minimum set of services of specified quality, at an affordable price and without distorting competition, including: i) connection to the public telephone network at a fixed location enabling end-users to take charge of voice communications, facsimile communications and data communications at data rates allowing functional Internet access; ii) special measures for disabled users ensuring that they enjoy equivalent service standards and functional levels as any other. Whilst the regulatory framework does not stipulate any specific data rate for Internet access, the *Digital Agenda for Europe* sets very clear targets in this regard, including full basic broadband coverage by 2013. The question whether USO is the best way to achieve them has been answered differently by the Member States. Only a few have chosen to include broadband as a specific legally enforceable users' right, while most decided to foster broadband deployment to extend coverage in rural areas or subsidise

²⁶ This is defined as the full unloading of the truck after an international transport.

²⁷ For example, if a Czech haulier carries out international road transport from Austria to Belgium, then once the truck is fully unloaded in Belgium, the haulier is allowed to do maximum 3 cabotage operations (all 3 in Belgium or one cabotage operation per Member State in other Member States).

²⁸ A haulier registered in one Member State cannot, even occasionally, carry out a domestic transport operation in another Member State unless it has completed an international transport operation during the previous 7 days. Or, as another example, a haulier carrying out an international transport operation with a partially loaded truck cannot utilise the spare capacity of the vehicle to do cabotage in another Member State.

²⁹ Right of an airline registered in one Member State to carry out domestic flights within other Member States.

³⁰ Council Directive 96/97/EC, Council regulation n° 95/93, Directive 2009/12/EC

³¹ This section leaves out sector-specific interventions such as support mechanisms to technologies/energy sources in the energy market. For example, in the electricity generation market, there is a tendency of nationally inspired interventions that prevents the energy market from functioning effectively. See section 3.3 of COM(2012)663 final.

connections for people with special needs³². Mobile broadband has also been the target of public policy, with coverage obligations included in spectrum tendering processes and coverage milestones and deployment speed among the criteria evaluated in the context of licensing procedures. In order to compensate for the net costs to which the USO might give rise, compensation mechanisms for operators with universal service obligations may be provided for, either with public funds and/or sharing costs between providers of electronic communications networks and services.

In **transport**, Regulation 1370/2007 lays down the conditions under which authorities have to compensate public service operators for the costs incurred when operating services for which public service obligations have been imposed or contracted. The basic rule is that public service obligations have to be compensated adequately in such a manner that no compensation payment exceeds the amount required to cover the costs incurred and revenues generated in discharging the public service obligations, taking account of a reasonable profit for the operator. The annex to the regulation provides detailed rules on the compensation which are applicable in case the public service contract is awarded directly. The compensation should cover the net financial effect which equals to the costs incurred in relation to a PSO minus positive financial effects generated within the network operated, minus receipts from tariffs and revenues generated by PSO activities plus a reasonable profit (meaning a rate of return on capital that is normal for the sector in a given Member States taking account of the level of risk that the public service operator incurs when executing its obligations under the public service contract). In many countries, the level of the compensation corresponds to the difference between the foreseen costs and revenues from ticket sales. The calculation of overall costs varies across countries. Although in principle Regulation 1370/2007 stipulates transparency and public tendering, Article 5(6) leaves it to competent authorities to decide whether to directly award rail contracts or to organise competitive tenders. For this reason, 13 Member States use direct negotiation to award a public service contract³³. Some other countries use both competitive tendering and direct award³⁴. Only the United Kingdom, Germany and Sweden award all public service contracts based on competitive tendering. The lack of transparency can give rise to over/under compensation. In particular, experience with a number of new Member States suggests that public authorities requests PSO on a large part of the network without adequately compensating for such obligations. Some of the railways companies concerned are likely to run the services at a loss³⁵.

In the field of **energy**, the EU legislation imposes a public service obligation to Member States with regard to electricity. Member States shall ensure that all households have the right to be supplied with electricity of a specific quality at a reasonable, transparent, easily comparable and non-discriminating price. In order to ensure the provision of universal services, a supplier of last resort can be appointed by the Member States/regulatory authority. Very often, the incumbent is entitled to play this role, which could be seen as conferring to him a competitive advantage, especially if no time limit is imposed on this activity. In addition, Member States are required to define "vulnerable customers" - a concept linked to the definition of energy poverty- , for which any form of protection could be applied³⁶. The protection of vulnerable customers can take different forms such as the prohibition of disconnection at critical times (winter) or the application of regulated prices to this category only.

3.3.2. Price regulation

In some network industries, like energy and railway, prices are not always left to market forces but subject to State intervention, giving a potentially wrong price signal to consumers³⁷. This contrasts with the gradual prevalence of market-based prices that has accompanied the process of market opening in other sectors where liberalisations are more advanced, like air transport and e-communications.

In **e-communications**, in particular, competitive prices prevail in retail segments, starting from the most liberalised one, i.e. mobile communications. However, on top of market-based prices, price regulation plays a crucial role in remedying ineffective competition pursuant to the regulatory framework, thereby further contributing to market opening. This is mainly the case of wholesale access price regulation by the NRAs (see *Box 2*) to the benefit of intra-platform competition, although a prominent example of EU-wide

32 For instance, Finland decided already in 2008 to extend the USO to broadband by legally setting minimum-speeds for connections; the UK government committed to universal service provision of at least 2 Mbps broadband by 2015; in France, the *France Numérique 2012* plan sets a target of full broadband access by 2012 through the creation of a certificate to providers offering a minimum of 512Kbps at affordable prices.

33 Austria, Belgium, Estonia, Greece, Spain, Finland, Hungary, Ireland, Lithuania, Latvia, Luxembourg, Romania, and Slovenia.

34 Bulgaria, Czech Republic, Denmark, Italy, the Netherlands, Poland, Portugal, and Slovakia.

35 CER (2011), DLA Piper, (2010).

36 Article 3(7) of the Electricity Directive, Article 3(3) of the Gas Directive

37 Given the economic importance of these sectors and their challenges in terms of CO₂ intensity, energy and transport markets should work efficiently in order to give the right price signals to consumers. The right price signals would incentivise consumers to use energy and transport services according to their social costs (including external ones such as the CO₂). Another important dimension is to leave price formation to market forces.

retail price regulation is represented by the caps imposed on the scarcely competitive roaming charges by the 2009 Roaming Regulation (see *Box 1*).

By contrast, in **energy and transport**, **price regulation can sometimes respond to social or industrial policy objectives**. For this reason, in **electricity and gas**, regulated energy prices are still in place in many Member States, in particular in the household segments. Phasing out regulated prices is part of the EU legislation. Beyond the legal aspect, price regulation contributes to distorting markets as prices correspond to other objectives – social for households or industrial when some industrial sectors receive implicit subsidies with lower energy prices. Moreover, when the end user price is capped or companies cannot fully pass costs onto consumer prices, it can lead to operating losses for companies (*tariff deficit* as these companies cannot cover their costs (Spain, Romania, Portugal)).

In **railway**, in the passenger segment (local and regional distance), ticket fares are very often regulated by the State in line with the definition of public service obligation. Very often, the public service requirements include tariff obligations (free tariffs or tariff reductions for some categories) which cannot be increased beyond some limits imposed by the government. Sometimes these tariffs can be set too low for companies to recover their costs, putting at risk the viability of the company (Hungary for example).

BOX 2: ACCESS PRICE REGULATION

In **e-communications**, the emphasis placed by the current framework on competition policy, especially by encouraging third-party access to existing infrastructure and identifying relevant markets where remedies to lack of competition could be imposed by NRAs, often resulted in widespread wholesale price regulation. This has been shaped also by the Commission's Recommendations and remarks under the Article 7 procedure (see *Box 1*). For instance, the 2000 Local Loop Unbundling (LLU) Regulation opened to competition the "last mile" of the incumbent's infrastructure with regulated access prices, and the 2010 NGA Recommendation³⁸ further intervened on these access charges in light of the transition from legacy copper networks to NGA ones. In particular, the general principle that regulated fibre access should be cost-oriented was set. In fact, choosing the right level for access charges is made even more crucial by recent developments like the need to incentivise investments in optic fibre networks. On the one hand, in fact, these investments entail significant risks that should be duly remunerated; on the other, high charges could squeeze alternative access-based operators' margins, which is contrary to EU competition law if practiced by dominant firms³⁹. Overall, cost-oriented price regulation seems appropriate⁴⁰ where significant market power (SMP) cannot be expected to erode in a reasonable period, mimicking an effectively competitive market performance, promoting downstream competition, and ultimately benefitting consumers, while giving the appropriate investment signals.

In **energy and transport**, non-discriminatory access to network has been progressively ensured through the requirement of vertical separation (unbundling) between the infrastructure owner and the service operator. Unbundling is a central piece of market opening in the Third Energy Package and in the railway legislation (see *Box 1*). As a complement, network access tariffs are regulated by the Regulatory Authority which provides guidance and principles on their setting.

3.3.3. State-Owned Enterprises

Privatisation and liberalisation are distinct policy although they are closely related⁴¹. The EU is traditionally neutral on the ownership of enterprises. Article 345 of the EU Treaty states that: "*the Treaties shall in no way prejudice the rules in Member States governing the system of property ownership*". This means that Member States are free to choose the forms of ownership of their enterprises. In other words, in a context of liberalisation of a sector induced by EU legislation, privatisation is not part of the legal obligations. Neutrality on company ownership also implies that the same rules apply to public and private companies. A public company will not be exempted from competition rules (unless the Treaty explicitly allows it).

The potential problems associated with public ownership include not only control issues, but potentially also preferential access to capital and distortions of competition both for and in the market which can be exacerbated by regulatory capture. State participation can take various forms, which makes the assessment of its potential impact more complex. For example, the relationship between ownership and control is not necessarily straightforward, as some of the best performing state-owned companies appear to operate largely as business companies, in which case the public ownership does not cause any potential distortions. State ownership may be more problematic when it is coupled with other market distortions, like price regulation in competitive segments, under or overcompensation of public

³⁸ See OJ L 251/35

³⁹ For further insight, see annex I on eComms

⁴⁰ COM(2010)271 final.

⁴¹ Newbery (1997; 2004).

service obligations, which ultimately bear on the performance of the company itself. Finally, in some countries, the State has a minority share but keeps some special rights –*golden shares*–, which may be in contrast with the free circulation of capital.

Most of companies in air transport⁴² and e-communications have been privatised during the liberalisation wave of the 1980-90s. As for the latter⁴³, however, a few EU governments still own majority (Belgium, Luxembourg, Slovenia) or minority (Austria, Germany, Finland, France, Sweden, Slovakia) shares in the incumbent. By contrast, the energy and railway sectors still display a high proportion of state-owned enterprises. The process of liberalisation in the energy sector, which started in the 1990s, has sometimes led to partial or complete privatisations of energy companies. The generation segment has been open to competition and fully or partially privatised, while transmission and distribution are mostly state-owned. In railways, the liberalisation process is less advanced despite several liberalisation packages adopted during the 2000s: in most cases, freight and passenger railway companies are fully state-owned. In some cases, State ownership can be indirect⁴⁴, when a share of a company is owned by a domestic State-owned entity or by a foreign state-owned undertaking. Table 2 provides an overview of the state ownership of e-communications, transport, and energy companies.

Table 2 – State ownership of e-communications, energy and transport companies

	Electronic Communications	Electricity	Gas	Railways		Air Transport
	Public ownership of the main public comm network operator	Public ownership of the first generator	Public ownership of the first supplier	Public ownership of the first freight operator	Public ownership of the first passenger operator	Public ownership of the first flag carrier
AT	26,68%	51,0%	31,5%	100,0%	100,0%	0%
BE	53,5%	0,0%	0,0%	100,0%	100,0%	0%
BG	n.a.	100,0%	100,0%	100,0%	100,0%	0%
CY	n.a.	100,0%	no gas & rail market			70%
CZ	0%	70,0%	0,0%	100,0%	100,0%	91,5
DE	14,8%	0,0%	0,0%	100,0%	100,0%	0%
DK	0,0%	76,0%	76,0%	2,0%	100,0%	14%
EE	51,0%	100,0%	0,0%	100%	100%	97%
EL	n.a.	100,0%	65,0%	100,0%	100,0%	0%
ES	0,0%	0%	0%	100%	100%	0%
FI	51%	51,0%	24,0%	100,0%	100,0%	56%
FR	26,97%	84,0%	35,0%	100,0%	100,0%	19%
HU	0,0%	100,0%	22,0%	0%	100,0%	n.a.
IE	0,0%	95,0%	96,7%	100,0%	100,0%	25%
IT	0,0%	31,2%	30,3%	100,0%	100,0%	0%
LT	n.a.	100,0%	0,0%	100,0%	100,0%	n.a.
LU	100,0%	25,0%	25,0%	100,0%	100,0%	27%
LV	n.a.	100,0%	0%	100,0%	100,0%	100%
MT	n.a.	100,0%	no gas & rail market			98%
NL	0,0%	0,0%	51,0%	6,0%	100,0%	0%
PL	3,0%	62,0%	72,0%	100,0%	100,0%	68%
PT	0,0%	4,0%	8,0%	100,0%	100,0%	100%
RO	n.a.	80,0%	100,0%	50,0%	100,0%	95%
SE	51,0%	100,0%	0,0%	100,0%	100,0%	21%
SI	55,15%	100,0%	39,0%	100,0%	100,0%	70%
SK	49,0%	34,0%	51,0%	100,0%	100,0%	n.a.
UK	0,0%	0,0%	0,0%	0,0%	0,0%	0%

⁴² In air transport, in new Member States, the State owns the majority of the air carrier.

⁴³ See, e.g., OECD (2011)

⁴⁴ E.g., in e-communications, the Estonian incumbent *Elion Enterprises Limited* is owned by *Eesti Telekom*, in turn fully owned by the *Telia Sonera* group: this is the incumbent and main mobile operator in both Finland and Sweden, whose governments own a share therein, respectively of 13.7% and 37.3%. The full privatisation of the Portuguese incumbent, save 500 shares still in the hands of the government, was enforced by a decision of the Court of Justice of the EU (Case C-171/08). Besides, on top of the Italian privately-owned *Telecom Italia*, OECD (2011) reports cases where full public ownership takes place through municipalities. As for energy, 24% of Gasum, the main supplier of natural gas in Finland, is directly owned by the Finnish state; 31% is also owned by Fortum, the main state-owned electricity company. Another example is Enovos, the biggest electricity and gas company in Luxembourg, in which the state has a 25% direct stake, a state owned investment fund owns another 10%, and also the City of Luxembourg has an 8% stake. In railways, national domestic operators have been bought by foreign state-owned undertakings: examples include Rail Cargo Hungaria, the leading rail freight company in Hungary, owned by ÖBB, the Austrian state railway company or Schenker and Arriva, the passenger and freight railway operators in the Netherlands, both of which are owned by Deutsche Bahn.

3.4. THE COMPLEMENTARITY BETWEEN THE EX-ANTE AND THE EX-POST REGULATORY FRAMEWORKS

3.4.1. Implementation of the ex-ante regulatory framework

The transposition, implementation and enforcement of EU ex ante regulatory framework determine the level of market integration across Member States. A **heterogeneous implementation will lead to bottleneck in terms of access to the market, of infrastructure interconnection and variety of services offered by operators.**

As regards **e-communications**, the deadline for the transposition of the Third Telecoms Package⁴⁵ into national legislation was May 25th 2011. While infringements were opened against most Member States in July 2011, as of October 2012, 25 Member States had notified the full transposition of the revised rules, while cases against the two remaining Member States (Poland and Slovenia) are pending before the Court of Justice of the EU, together with 14 non-conformity cases. In fact, conformity assessments are on-going in accordance with the overall implementation strategy in this area, which focuses on structural issues such as independence of the regulator, respect for the consultation procedures, and key consumer protection issues. The implementation of the ex-ante EU regulation is entrusted to NRAs, but the Article 7 mechanism (see *Box 1.1* in annex I) allows the Commission to ensure compliance and consistency with the common rules and principles laid down in the Directives. It is however observed that there are differences across national regulations that may not be fully justified by country-specific competitive and structural factors. E.g., since NRAs are allowed to use different methodologies in setting cost-oriented wholesale access charges (see Section 2.3.1)⁴⁶, the Commission has observed this flexibility translating into marked regulatory divergences even when NRAs proposed the same asset valuation method for the same access products, in particular full local loop unbundling (LLU)⁴⁷.

As regards the **energy** market, the transposition and implementation of the Third Energy package is on-going. Since September 2011 the Commission opened 19 cases for non-transposition of the Directive 2009/72/EC and 19 cases for Directive 2009/73/EC. As of 1st October 2012, only 9 cases have been closed. Conformity checks are on-going. No infringement cases for non-conformity have been opened to date.

As far as **transport** is concerned, according to Kaeding (2007), in a sample of nine Member States over the 10 year period 1995-2004, problems in the transposition process occurred in about two-thirds of all national implementing measures. About 47% of national implementing measures have been notified late to the European Commission with a maximum delay of almost 5 years. In addition to transposing Directives on time, Member States need to ensure that the EU rules are transposed correctly and are fully applied and enforced. According to the Internal Market Scoreboard 2011, there were a total of 1001 open infringement cases (excluding the cases of non-communication) as of 1 May 2011. Almost 10% of these cases related to transport, making transport the third most significant source of infringements after environment and taxation. At the end of September 2012 the total number of transport related open infringement cases (including infringements for non-communication) was 243. Of course, the potential seriousness and impact of individual cases vary so these numbers have to be treated with caution. For example, in railway transport, the Commission launched an infringement case on the application of market access laws against 24 Member States in 2008. New entrants typically depend on good cooperation with incumbents, who still exert more or less full control over the infrastructure - if not the lines, then the terminals and other rail related services. At the end of September 2012 the total number of transport related open infringement cases (including infringements for non-communication) was 243. Of these, 74 cases were related to road, 70 to air, 62 to maritime and 36 to rail transport and 1 to public service obligations. In railway, the Commission launched an infringement case on the application of market access laws against 24 Member States in 2008. New entrants typically depend on good cooperation with incumbents, who still exert more or less full control over the infrastructure - if not the lines, then the terminals and other rail related services.

⁴⁵ Directives 2009/136/EC and 2009/140/EC.

⁴⁶ These different cost models to estimate the cost of the wholesale services provided by the SMP operator to TPA seekers include, e.g., the fully distributed costs (FDC), the long-run incremental costs (LRIC), each combined with different modelling approaches like top-down, bottom-up, or a hybrid model, and each based on different asset valuation methods like historic cost accounting (HCA) or current cost accounting (CCA).

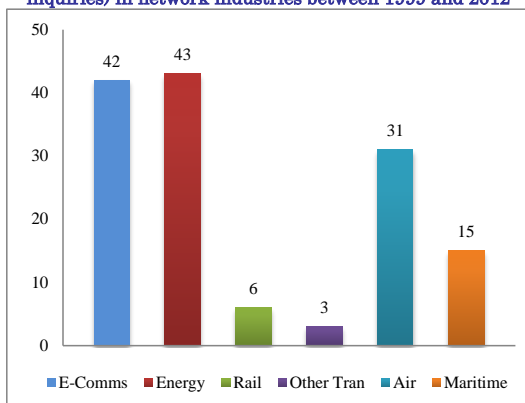
⁴⁷ In fact, monthly average total costs per fully unbundled copper loop range from the extreme of 5.34 €/month in Poland to 14.37 €/month in Finland. Although this should range be compared with the standard variation for these prices, it is worth noting that, to address these issues and provide more regulatory predictability and consistency across the EU, the Commission will issue by the second quarter of 2013 a Recommendation on the application of non-discrimination obligations and on costing methodologies for key wholesale access prices.

3.4.2. Competition enforcement: the ex-post regulatory framework

In order to be effective, the liberalisation process has to be accompanied by strong competition enforcement. Anticompetitive measures can include access to essential network industries and cross-subsidisation between different segments (Gerardin, 2006). The enforcement of antitrust rules, in particular pursuant to Articles 101 and 102 TFEU, is important in order to ensure the effectiveness of ex-ante regulation.

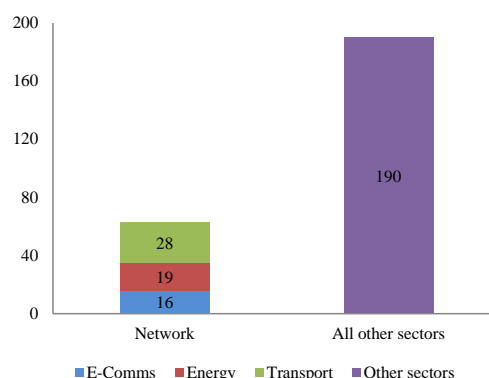
As far as antitrust and cartel cases are concerned⁴⁸, network industries represent some 25% of the total competition final decisions made (see Graph 6b). In fact, between 1999 and 2012, 63 final antitrust decisions out of 253 were related to e-communications, energy, and transport. However, if one includes also pending cases and sectoral inquiries, the total number of competition cases opened in network industries is more than twice as much, reaching some 140 (see Graph 6a): this indicates the relevance of competition issues in these sectors. In particular, incumbent operators still occupy a prominent role in domestic markets and are often responsible for unfair practices that constitute barriers for competitors.

Graph 6a: summary of all open competition cases (including third countries, pending decisions and general sectoral inquiries) in network industries between 1999 and 2012



Source: Commission services

Figure 6b: summary of final antitrust decisions (including Commission's statements of objections) made in network industries and other sectors between 1999 and 2012



Source: Commission services

E-communications and energy account for the highest number of opened antitrust cases. The transport sector is not homogenous as the different transport modes have different legislative frameworks, however the air sector is clearly the most concerned: 19 out of the 29 decisions taken on closed cases between 1999 and 2012 relates to the air business while only 2 to rail services. **E-communications** have been characterized by a high level of action against verified or suspected antitrust practices, with 42 open antitrust/cartel cases since 1999, including investigations following operator's notifications/complaints and three waves of sectoral enquiries launched by the Commission between end of 1999 and end 2000 to assess the respect of competitive rules in, respectively, leased lines, mobile roaming agreements, and access conditions to the local loop. Out of these, 16 final decisions concerning eComms operators were reached, including 9 rejections, individual exemptions or clearances, and 7 prohibitions, fines, or statements of objectives. In particular, since the approval of the 2002 Second Telecoms Package, 5 relevant cases can be traced where significant fines were imposed on incumbent operators for abuse of dominant position or cartel agreements⁴⁹. Overall, ex post competition law enforcement has meaningfully complemented the evolution of the ex-ante regulatory framework, and has thereby played a crucial role in the liberalisation of the e-communications market.

The **energy** sector has been subject to three main waves of liberalisation (the so called First, Second and Third Energy packages). Yet in some Member States a vibrant competition in the gas and electricity markets has still to take off, partially because of a slow implementation of the legislation but mostly because of the nature of the sectors, characterized by high entry costs and by physical limitations in terms of infrastructure capacity. Most of the antitrust cases reported in Table 5 section 5 relate to overly long-term supply agreements between incumbent companies which foreclosed infrastructure and impeded the

48 The selected cases are all antitrust/cartels decisions in sectors D, J61, and H49-52, including Commission's statements of objectives but excluding actions brought against Member States without final referral to the Court of Justice, as retrieved in the Commission Services' database <http://ec.europa.eu/competition/elojade/isef/index.cfm> and assessing their outcome on the basis of the latest available documentation therein. The open cases in each network industry are based on the Commission Services' sectoral database (<http://ec.europa.eu/competition/sectors/telecommunications/cases.html> for eComms, http://ec.europa.eu/competition/sectors/energy/cases_en.html for energy, and <http://ec.europa.eu/competition/sectors/transport/cases.html> for transport)

49 This is the case for *Deutsche Telekom AG* (fined 12.6mn € for unfair pricing of local network access), and the *Wanadoo* subsidiary of *France Télécom* (fined 10.35mn € for predatory pricing in ADSL) in 2003, as well as, more recently, the Spanish incumbent *Telefónica* (fined in 2007 151.875mn € for margin squeeze in the broadband market), and the Polish one *Telekomunikacja Polska* (fined in 2011 some 127mn € for restricting access to wholesale broadband market). Besides, the 2011 statements of objections sent to *Telefónica* and *Portugal Telecom* has recently ended (23/01/2013) in fine of 66.894mn € on the former and of 12.29 mn € on the latter, for agreeing not to compete with each other on the Iberian telecommunications markets, in breach of Article 101 of the TFEU.

participation of other competitors. Furthermore, it is significant to underline that the number of antitrust cases in the last five years basically equals that of the rest of the period considered with a renewed wave of cases (some still pending) after 2008. Finally it is to be noted that antitrust cases concerning Third Countries have not been included in the table. However their relevance is undisputed since they involve some of the main energy suppliers to the European Union, such as Norway, Algeria or Nigeria. Non-discriminatory access to foreign energy sources is fundamental for most EU countries due to the high dependency on imports.

In the **transport** sector more than half of the open cases relate to the air services. The early liberalization process in this sector has yielded positive results in terms of price decreases and wider market participation. Most of the recent cases had to do with cooperation agreements between companies which became possible in the early 2000s and that the Commission has generally approved after negotiating with the partners the contract's terms in order to preserve fair competition rules (19 out of 29 Commission decisions resulted in either a simple clearance or a clearance with some agreement adjustments, cf Table 5 in section 5). Fines and prohibitions occurred mostly around the end of the last century and the beginning of the new one. In the last ten years, only one case resulted in a fine for 11 air cargo carriers. The railway sector is so far the least subject to competition cases and investigations. However, worryingly low levels of competition in this sector registered in most Member States suggest that more stringent measures will probably have to be taken in the future to enhance the participation of a wider range of players, improve the quality of the services and reduce consumers' prices.

4. MARKET OPENING IN NETWORK INDUSTRIES: STATE OF PLAY

Network industries –e-communications, energy, and transport– play a major role in the economy. For this reason, it is relevant to look at their current market functioning as their market opening was expected to bring economic benefits through improved competition and dynamic efficiencies.

The EU legislation provides *ex-ante* regulation across network industries, although its scope varies considerably among them. Overall, competition is not fully effective in some of these sectors, given, for instance, their high level of State intervention, the number of competition cases, and the still important role of the historical incumbent, sometimes representing bottlenecks for further market opening. An exception is offered by air transport passenger and some eComms segments like mobile communication services, whose prices have fallen substantially in the EU after 2002. Still, competitive conditions are often backed by regulation, including the crucial role played in some sectors by national regulators in ensuring the implementation of the *ex-ante* European framework⁵⁰. Given the importance of ex-ante regulation in promoting competition and contributing to market opening, one should take into account the risk that differences across countries in its implementation, and subsequent regulatory inconsistency, may reduce the opportunity of fully reaping the benefits of market opening.

Annexes I, II, and III of this report look separately at each network industry under scrutiny, i.e. electronic communications (fixed and mobile telephony, and Internet access and services), energy (electricity and gas) and transport (rail, road, maritime and air). Where possible, they provide an assessment of incumbents' market shares, wholesale and retail price evolution, and infrastructure interconnections in order to assess the state of play in terms of market opening and integration therein. A closer analysis reveals that the degree of competition and market conditions vary greatly across Member States, in spite of the presence of a strong EU legislative body. For instance, in e-communications, in spite of the indubitable success of the liberalisation process compared to other network industries, persistent differences among Member States in price and non-price performance indicate the need to step-up efforts in order to achieve a genuine internal market for them, allowing also to better reap the benefits of market opening. The same is observed in energy where efforts still need to be made despite progress over the past years. Moreover, in networks like transport, the level of EU requirements varies across segments, which leads to strong heterogeneity of market opening across modes, harmful to multi-modality and interconnectivity within the sector. These persistent differences deserve attention as they could prevent the Member States from reaping the full benefits from the liberalisation of these sectors, as would be possible within a genuinely integrated internal market. This Section summarises the main conclusion drawn in these Annexes.

⁵⁰ In e-communications, for instance, this is, respectively, the case for: i) the substantial decrease of roaming tariffs thanks to the approval of the 2009 (revised) Roaming Regulation in the wake of the lack of adequate competitive conditions in that segment; ii) the overall decrease in wholesale access charges due to the NRA's intervention in the relevant markets 4 and 5.

4.1. PRICE CONVERGENCE

The main objective of achieving the internal market is to increase competition and attract new entrants, hence lowering prices while increasing choices for consumers. One expected outcome is an increased price convergence across countries as competition will gradually be stepped up from national to European level⁵¹. Measuring price dispersion can be a good way to assess whether EU market integration has actually taken place. Overall, **price dispersion remains high in e-communications and energy**.

As for **e-communications**, a distinction should be made between regulated and competitive prices: in both cases, high cross-country dispersion can be read as signal of partial integration, either in terms of a competitive level playing field for eComms operators, or of consistent national implementation of the EU *acquis*, in turn often meant to remedy lack of competition. As shown in Table 3, significant fragmentation persists among national eComms markets after two decades of liberalisation, not only in the competitive (e.g. mobile telephony) but also in regulated segments like roaming, where the smallest dispersion⁵² (between 13 and 16%) can be traced. All other coefficients of variation, with the only exception of LLU wholesale access charges and median retail broadband prices, are systematically above 30%, above those in the energy sector. Even more interestingly, they are mostly characterised by an upward trend over time in both wholesale and retail price performance, anyhow interrelated. However, one should consider that the fast improvement of competitive conditions in this sector over recent years, and in particular generally downward-trended prices (see annex I, Section 2) may have contributed to the higher observed dispersions than in sectors, like energy, where retail regulation still prevails. Moreover, the very recent transposition of the Third Telecoms Package may not yet have allowed a full exploitation of the potential offered by the more coordinated EU-wide regulatory approach it inaugurated, which could be the key to step up efforts towards a full-fledged *Single Market for eComms*.

As far as **energy** retail price are concerned, between 2008 and 2011, their dispersion increased for industrial customers both in electricity and natural gas (see Table 3). In the case of households, price dispersion has decreased in electricity while it increased slightly in gas during the same period. Noticeably, price dispersion increases when taxes are included, which confirms the contribution of taxes to the heterogeneity of energy prices⁵³. Interestingly, price dispersion is not observed on electricity wholesale markets where spot price has progressively converged over the past years. In well-functioning energy markets, retail prices would be expected to mirror the process of convergence observed upstream (wholesale). Obviously, the relative higher dispersion of retail prices has to do with other factors than wholesale market fragmentation⁵⁴.

51 In a perfectly integrated market, under some assumptions on supply and demand, domestic prices should equal foreign prices (the Law of One Price) (CASE Warsaw, Economic Paper, 2007). This is not observed in the real world as there are many other factors, like the geography and legacy infrastructure in e-communications or the energy mix, which can justify that prices do not fully converge. However, the level of price convergence and its evolution can give some insights into progress made to establish an internal market for network industries. See also Martin and al (2001).

52 For more detailed information on how these dispersion measures are computed, on the basic price and non-price indicators, and for further measures of integration in e-communications, see annex I on eComms, Section 3.

53 One has to be cautious with the interpretation of these results. The evolution of oil can also influence electricity and gas prices. Although it could be considered as a common external shock, the resilience of economies to such shocks will depend on the electricity mix of countries.

54 ACER (2012) reports the correlation between wholesale and retail prices (energy component) in electricity and natural gas. In general, a correlation is observed between retail electricity prices (leaving aside taxes) and wholesale power prices. Moreover, the correlation is better in countries without regulated end-user prices. By contrast, the correlation is weaker in the natural gas, even in the non-regulated countries.

Table 3: Price dispersion (coefficient of variation) in eComms and energy – EU27

	2008	2009	2010	2011
E-communications (retail)				
Price of high-usage OECD basket of fixed telephony	20.59%	26.49%	30%	-
Average price per minute of mobile communications ⁵⁵	41.91%	44.88%	46.13%	-
Intra-EU roaming charges (call made)	-	-	-	13.1 - 16.0%
Median (all offers, all years) price for fixed broadband	-	-	26.14%	-
E-communications (wholesale)				
Fixed termination rates	40.48%	46.89%	55.94%	59.69%
Mobile termination rates	31.12%	31.24%	30.09%	36.76%
Full LLU access charges	22.7%	24.48%	23.18%	25.75%
Shared access charges	47.81%	49.12%	48.25%	50.2%
Electricity (retail)				
Industry (excl taxes) - consumption 500-2000 Mhw	27.71%	24.58%	27.02%	28.82%
Industry (excl VAT) - consumption 500-2000 Mhw	25.76%	23.21%	25.31%	27.42%
Households (excl taxes) - consumption 2500-5000 kwh	24.85%	24.40%	22.40%	23.64%
Households (excl VAT) - consumption 2500-5000 kwh	29.80%	28.97%	27.16%	28.49%
Electricity (wholesale)				
Spot prices*	17.1% (3.14%)*	7.26% (4.86%)*	7.22% (2.87%)*	-
Natural gas (retail)				
Industry (excl taxes) - consumption 10000 Gj-100000 Gj	16.99%	17.35%	18.60%	19.96%
Industry (excl VAT) - consumption 10000 Gj-100000 Gj	22.19%	19.75%	24.27%	25.47%
Households (excl taxes) - consumption 20 Gj-200 Gj	21.87%	19.88%	22.44%	22.28%
Households (excl VAT) - consumption 20 Gj-200 Gj	28.06%	26.13%	31.34%	31.01%

Source: calculated from European Commission, DAS, (2012), Teligen (2010), and Eurostat.

* Data from Huisman and Kilinc (2011). Spot prices refer to weighted average price for APX, BELPEX, EEX, NPX and EPEX. Data in bracket are without NPX. See annex II, section 3.3 on wholesale markets.

4.2. IS MARKET OPENING EFFECTIVE?

As analysed in annexes I, II and III, efforts still need to be done in order to ensure full market opening in network industries (see conclusions in *Box 3*).

4.2.1. Heterogeneity of market opening across network industries

While there are other factors (e.g. geography and legacy infrastructure) driving network prices, insufficient competition can also be identified as one explanation for differences observed across Member States. Over the recent decades, market opening has been implemented across Member States following the waves of EU regulation packages. However, very often, competition is still far from being effective as reflected by the high share of the incumbent in most of the network sectors.

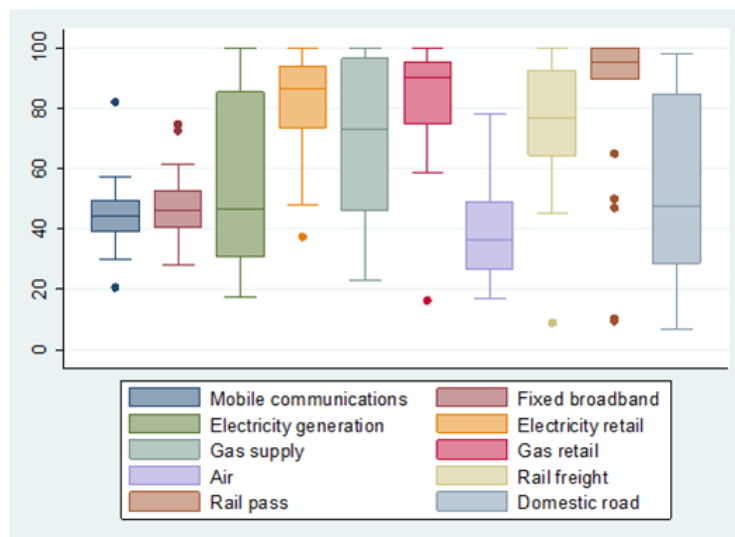
Market shares of incumbents can represent an imperfect proxy of the degree of market opening in each network industry. Moreover, their dispersion can provide some insights about the homogeneity of market structures across Member States. At the extreme, a fragmented market would be expected to lead to high domestic market shares of incumbents and low dispersion of these market shares across Member States. This is mainly observed in the railway passenger market which displays a low dispersion due to the fact that market opening is not implemented in many Member States (Graph 7). At the opposite of the spectrum, fully opened market would be expected to lower the market shares of incumbents across the board. This is observed in air transport and, as far as e-communications are concerned, in the competitive mobile segment and the fixed broadband segment, where entrants' access is regulated⁵⁶. This can be considered a signal of the relative success in these sectors, either in terms of early liberalisation or of adequate implementation of third-party access regulation. More specific is the case of the road freight sector which displays low median market shares of domestic traffic, but high dispersion. Despite an early and successful liberalisation, the penetration of international road traffic still varies across countries. Finally, in

⁵⁵ As explained in annex I on eComms, the dispersion reported for 2010 refers to the average *revenue* per minute of mobile communications, whose definition is slightly modified with respect to the former: nevertheless, its commonality among Member States should not justify significant changes in the dispersion thereof.

⁵⁶ Fixed voice is not included as the incumbents' market shares reported in European Commission (2012b) are artificially increased by the lack of consideration of all voice-over broadband services.

the energy sector, concentration remains high, in particular in the natural gas segment. Furthermore, the dispersion in the electricity and gas generation/production segment remains high, which reflects the heterogeneity of market opening across Member States. In the energy retail markets, the dispersion is lower, but the high level of market shares reflects the likelihood of insufficient competition in a large number of countries.

Graph 7: Dispersion of market concentration in network industries (2010)*



Source: calculated from Eurostat and European Commission, DAS (2012). (*2009 data for air transport). For mobile: market shares of the main national operators in mobile services. For fixed broadband: market shares of national incumbent operators in fixed broadband services. For energy: market share of the largest electricity generators and the largest entities bringing natural gas into a country, cumulative market share of the main retailers (with at least 5% of the market). For rail: market share of largest operators in freight and passenger. For air passenger: market share of the historical incumbent. For road freight: share of domestic traffic in total road traffic.

Reading: The horizontal line in the box corresponds to the median market share across countries; the edges of the box represent the dispersion of concentration patterns across countries, measured by the 1st and 3rd quartile of their distribution. The lines outside the box correspond to the extreme values of the distribution, measured by the upper/lower quartile ± 1.5 times the inter-quartile range). The dots represent outliers.

4.2.2. Heterogeneity of market opening in Member States

Another important issue is the national factor, i.e. the Member States' proneness to open their network markets across the board. In most network industries like e-communications, energy, railway, and ports, fragmentation arises when national considerations have tended to prevail, and still prevail, despite a well-developed EU framework (except in ports). For some of them, this is explained by the strategic role played by these industries in the past: e.g., as far as energy is concerned, the trade-off between competition and security of supply make these industries crucial in some countries where only one external energy source makes this country vulnerable to any supply disruption. In other cases like e-communications, this stems also from the systematic coexistence, in the current framework, of EU-wide rules and country-specific implementation by the national regulators, especially in the form of remedies in the case of lack of competition (see Box 1). This, coupled with the fact that remedies are set by the NRAs at a national level, with subsequent divergences also as far as timing and procedures are concerned⁵⁷, may have added to regulatory uncertainty and most likely contributed to the existence of high price and non-price dispersion among Member States (see annex II). This regulatory uncertainty may well have been also one of the drivers of a "broadband gap" among Member States, for instance in terms of coverage and take-up, contrasting with the incentive towards integration provided, among other initiatives, by the EU-wide Digital Agenda targets on this.

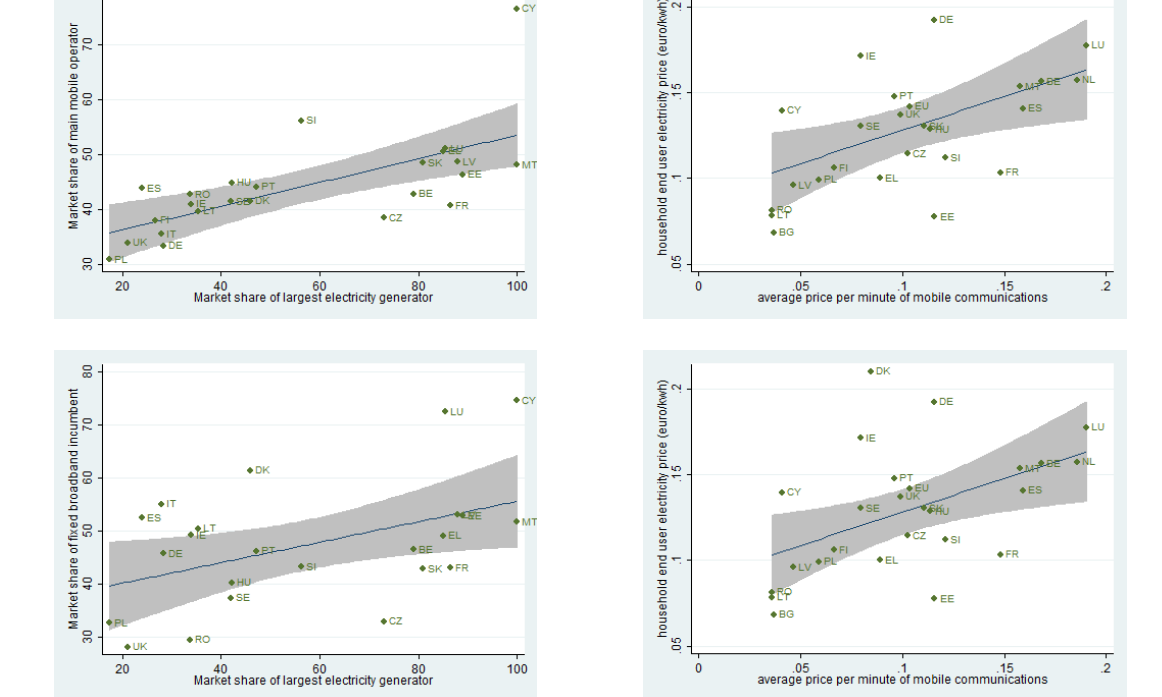
A certain degree of correlation can be traced among the market shares of the main national operators and among the relevant price levels across network industries. For instance, Graph 8 shows this positive correlation between segments of different network industries - mobile communications and electricity generation, fixed broadband and electricity generation, natural gas and air transport⁵⁸. This **hints at the presence of possible national factors which could play a prominent role in explaining the marked**

⁵⁷ The NRAs' "national" focus is emphasised, e.g., in Pelkmans and Renda (2011) and Ecorys (2011); according to the latter, in fact, the main perceived barriers to having an internal market in eComms are: i) regulatory uncertainty, making markets less attractive for entry and reducing incentives to invest; ii) heterogeneity in the implementation of regulation, forcing multi-country operators to duplicate costs thereby limiting opportunities to realise economies of scale; iii) national orientation of sectoral regulation, resulting in a lack of standardised wholesale offers fit for multinational corporations and thus increasing the operating costs for multinational operators.

⁵⁸ The reported correlations have been chosen as the highest 5%-significant pairwise correlations across networks. The prices in mobile communications and electricity generations are, respectively, the average price (€/min) of mobile voice communications and the end-user electricity household price (€/Kwh) for households (both excluding VAT) in 2009.

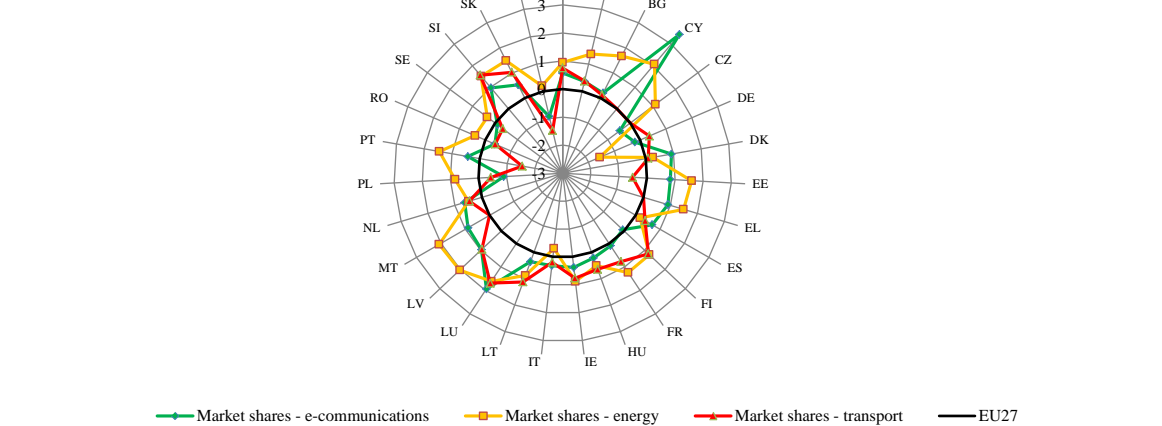
Graph 8: Competition in network industries and national pattern (2010)

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This is confirmed also when looking at Member States' market opening in e-communications (mobile communications and fixed broadband), energy (electricity and gas), and transport (railway and air), as indicated by the main sectoral operators' market shares, normalised to the EU27 (weighted) average (graph 9). In fact, in some countries like Cyprus, Luxembourg, Malta, Slovakia, and Slovenia, **the major national operators hold a relatively large share of the market in all network sectors**. Conversely, some countries like Germany, Italy, and the United Kingdom, exhibit a relatively higher degree of market opening across all network industries. Between these two extremes, or "clusters" of countries, it is harder to find a specific pattern displayed by the Member States, **which appear mostly in line with the pace of market opening determined by the EU regulatory framework**, namely with relatively higher market opening in e-communications and in air transport than in energy and rail⁵⁹.

Year	UK	AT	BE
1970	15	15	15
1975	20	25	25
1980	25	35	35
1985	30	40	40
1990	35	45	45



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BOX 3: MARKET OPENING IN NETWORK: SUCCESS AND REMAINING BOTTLENECKS

Annexes I, II, and III provide a detailed description of the state of play of each network industry under scrutiny: e-communications, energy, and transport. As for **e-communications**, the analysis of competition reported in annex I reveals that the liberalisation process characterising this industry at the EU level over the last decades has been a success in most regards, especially in terms of price reduction in specific segments compared to other network industries. Overall, despite national differences and data limitations, the employed indicators hint at improved competitive conditions in terms of market structure and price performance. The analysis of specific markets like roaming, mobile interconnection, and fixed broadband, reveals that an often crucial role in the liberalisation has been played by the regulator both at the EU and the national level, given the crucial sector-specific duality between integrated EU-wide interventions and NRAs' implementation and enforcement. Despite the global improvement of competitive conditions across different eComms segments in the EU, there remain price differences among Member States in terms of prices, market power, consumer's choice, and implementation of the regulatory framework beyond what national factors can explain. In fact, different dispersion measures (price disparities generally above 100% and coefficients of variation over 30%) seem to confirm that significant fragmentation still exists among national eComms markets and is not significantly decreasing over time. Although the values are generally lower, this remains substantially true even among EU15 countries only, which faced more than a decade of liberalisations since the "First Telecoms Package" (see *Box 1*). However, the 2009 Third Telecoms Package and broader initiatives like the *Digital Agenda* for Europe seem to go in the right direction in terms of increased emphasis on EU-wide regulatory approaches.

In **electricity and gas** (generation, infrastructure, supply), progress has been made since the adoption of the Third Energy Package in 2009. However, there are still bottlenecks hampering the good functioning of these markets. First, the insufficient cross-border interconnection seems to be a common feature of Member States. In many Member States the level of electricity network interconnection is very low while gas pipelines interconnection is not always satisfactory. Access to infrastructures is essential to ensure the operation and the liquidity of the energy markets. Arguably, many projects are on-going at EU and national level and cross-border interconnection has been identified as one of the main EU priorities. However even when interconnections do exist, cross-border trade is still hindered by a lack of harmonisation of market rules and other obstacles. Second, the development of gas trading platforms which could allow a more direct matching of demand and supply is still virtually absent in the South and East Europe where long-term supply contracts are the main feature. In gas, EU imports are concentrated in a few countries (Russia, Norway and Algeria), which benefit from some form of market power. Very often, this external constraint has been alleviated when countries have developed gas trading markets. For other countries, the reliance on long term contracts indexed to oil prices has made gas markets less flexible to adapt. Third, the concentration in the retail markets in electricity and gas also seems to be a common factor in many Member States, which would deserve monitoring as it is the final link between upstream markets and customers. Finally, public ownership, in particular in the gas sector, is a common feature which could require further examination. Public ownership should not be seen as an indicator of underperformance, but, in some cases, can be an obstacle to increased competition. The shortcomings identified in the four domains above are a clear indication of sub-optimal levels of market integration and competition.

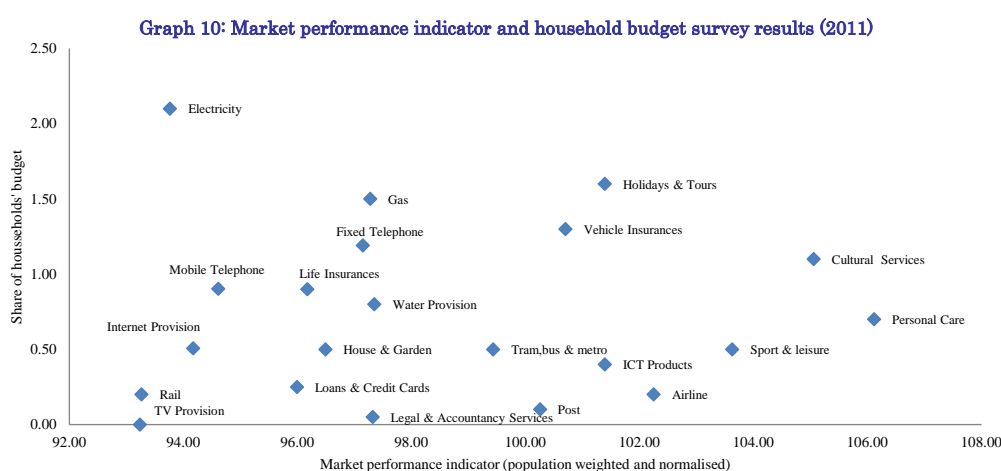
In **transport**, the same level of market opening across transport modes is not achieved although it could favour inter-modality. Inter-modality is a key issue as people and goods should be able to move easily from one mode to another one. However, the heterogeneity of market opening across modes makes it more difficult. Market fragmentation in the **railway** sector remains an issue, first of all because of the technical barriers that render cross-border services more difficult, secondly because of the reluctance of Member States to open their domestic rail markets to effective competition. In addition, most of railway companies are state-owned, some of them being part of the public administration still recently⁶⁰. Without level playing field, monopolist or quasi-monopolist companies which are shielded from competitors or subsidized in some Member States could use undue profits to expand in more open Member States, creating market distortions. This appears to be the case in railways where incumbent undertakings are often shielded from competition by complacent regulatory frameworks, high access charges, lack of competitive tendering, lack of transparency in the PSO funding which allows cross-subsidization and high entry technical barriers. As a result only a few national monopolists are able to compete on a European scale, when they are actually allowed to do so. The **shipping** industry has become very much globalised and intensive competition in the sector and consolidation of shipping companies and increased economies of scale in vessel sizes have delivered benefits for shippers. Restrictions on the provision of services at ports and a lack of sufficient connections to the hinterland represent barriers to further efficiency gains. In most countries, ports have been sheltered from competition, which lowers incentives to invest in intermodal connections and to provide high quality services. While due to geographical reasons ocean shipping enjoys a dominant position in extra-EU trade, further efficiency improvements would offer opportunities in short-sea-shipping as an alternative to road transport. **Road** transport is the dominant transport mode in inland transport and the fully liberalised international road freight transport sector is characterised by high level of market integration across the EU and a very high level cross-border competition between operators. Most of the output of the sector is generated by small companies and due to the low barriers to entry that there is a continuous flow of new entrants. This exercises a strong downward pressure on profit margins in the sector as a result of which customers benefit from a combination of low prices and flexible door-to-door services. The access of foreign road transport operators to the domestic transport markets is still restricted and further efficiency improvements are expected if these restrictions are further relaxed or abolished. However, as in many Member States lower labour costs represent a main competitive advantage for foreign freight transport operators, it is likely that further market opening will be subject to further harmonisation of the working conditions of the drivers to make it socially acceptable. The liberalisation of the

⁶⁰ In some countries (Belgium, France, Luxembourg), employees in railway companies have a specific status. See European Foundation for the Improvement of Living and Working Conditions (2012).

air transport sector delivered new airlines and new connections to passengers who have access to affordable fares which has been a source of growth in the sector. Further liberalisation efforts should focus of the supporting industries to deliver fair competition between air carriers.

4.3. USERS' PERCEPTIONS OF NETWORK SERVICES

At the moment, there are still bottlenecks hampering the good functioning of network markets in the EU (see *Box 3*). This may be somehow reflected in a **lower consumers' satisfaction regarding the performance of the services provided by most of the network industries** under scrutiny. In fact, as shown in Graph 10 below, recent results of the *Consumer Market Scoreboard*⁶¹ indicate that, with the notable exception of airlines, there is quite a considerable room for improvement especially for e-communications, energy, and transport. In fact, fixed telephony, mobile telephony, Internet provision, electricity, and train services rank, respectively, 38th, 43rd, 45th, 46th and 47th out of 51 consumer markets for goods and services at the EU level in terms of Market Performance Indicator⁶². This well reflects a below-average performance of network industries within the already underperforming services with respect to goods, and becomes even more worrying, especially for electricity, mobile phone, and railway services, when their share in household budget is also taken into account.



Source: Commission services

Finally, a risk intrinsic in the market fragmentation is that businesses can face competitive disadvantages in some Member States because of the higher costs and less efficiency of the network industries at their disposal: for instance, this obviously applies to energy input but also to e-communications. In the former case, industrial representatives of the most expensive Member States have repeatedly complained about the higher prices they are charged for electricity compared to their European competitors. In the latter, national discrepancies for instance in terms of broadband availability, quality, and price may translate into different costs and opportunities for ICT-using businesses and thus into factors of locational (dis-)advantages, which should come under pressure in a well-functioning internal market. Likewise, an inefficient transport system in a country will affect its domestic business's ability to deliver goods in a timely and cost-effective manner. In addition, it can lead to traffic diversion from foreign operators, increasing the inefficiencies at EU level.

The potential gains of removing these bottlenecks have been quantified in terms of productivity impacts as well as job creation (see *box 4*).

⁶¹ See the Commission Services' *Consumer Market Scoreboard*, 6th edition (October 2011)

⁶² The MPI is a composite index based on the results of survey questions on four equally-weighted key aspects of consumer experience, i.e.: i) the ease of comparing goods/services; ii) consumers' trust in retailers/suppliers to comply with consumer protection rules; iii) the experience of problems and the degree to which they have led to complaints; iv) consumer satisfaction (the extent to which the market lives up to what consumers expect). The MPI provides a "signal" of how consumers perceive markets rather than a full assessment of their functioning.

BOX 4: THE COSTS OF FRAGMENTATION

The mentioned bottlenecks to the EU-wide convergence to better competitive conditions in network industries have a cost. In the past, there has been some quantification on the economic gains from market opening. Copenhagen Economics (2007) found that gains in welfare and value added in the EU15 could reach 1.3-1.7% and 1-1.6% after full market opening of network industries (energy, railway, e-communications, and postal services). The potential gains were driven by e-communications, electricity and postal services as these sectors account for a large share of the economy and their price and productivity changes are larger.

As for **e-communications**, Copenhagen Economics (2010) estimates that overcoming country-specific fragmentation by reaching a full-fledged competitive *Digital Single Market* would imply a gain of 4% of GDP at the EU level over 2010-2020, which corresponds to a gain/capita of more than €1000, close to the estimated impact of the 1992 Single Market programme. A more recent study conducted for the Commission by Ecorys (2011) has shown that the economic gains resulting from the building of the internal market for electronic communications would amount to 0.5% to 0.9% of GDP per year, thanks to higher efficiencies generated by more competitive markets and economies of scale. Moreover, since the objective of achieving a true internal market for eComms is closely intertwined with bridging the mentioned broadband gap among Member States, it is worth providing an idea of the economic benefits that the related investments could entail: namely, it is estimated by Czernich *et al.* (2009), based on a panel of OECD countries over 1996-2007, that a 10pp increase in broadband penetration could raise annual per-capita growth by 0.9-1.5pp. Numerous studies point to the considerable benefits of broadband investments, including social (reduced isolations of regions and individuals), economic (net job creation), and environmental (reduced carbon emissions) ones: among these Fuhr and Pociask (2007), Davidson and Santorelli (2009), McKinsey Global Energy and Materials (2009), and Greenstein S. and McDevitt (2011).

In Ilzkovitz *et al.* (2007), an attempt is made to quantify the effects of a further liberalisation of the **energy** (electricity and gas) sector. A price reduction of 20% would be associated with a price decline of 0.6% in the non-tradable sector. This reduction in prices has been translated into a total factor productivity (TFP) and a mark-up shock in the European Commission QUEST model. The shocks associated to the 20% price fall in the electricity sector were thus assumed to correspond to a TFP increase of 25% or to a decline in mark ups by 15 percentage points. The respective effects of a TFP and a mark-up shock are different. Over a period of five years, the GDP effect generated with the two channels is quite similar and amounts to about 0.5% of GDP. In the longer run, however, the effect from a reduction in mark ups seems somewhat stronger. A similar analysis for the gas would lead to effects equal to roughly 30% of those observed for electricity.

Bourlès *et al.* (2010) analyse the influence of upstream competition on productivity outcomes in downstream markets. Upstream markets include network industries. In their model, they show that weak upstream competition can curb efficiency growth in downstream firms. They test the prediction for fifteen OECD countries and twenty sectors over the period 1985-2007. The results suggest that the marginal effect of increasing competition, by easing regulations in upstream sectors, would increase multi-factor productivity growth by between 1% and 1.5% per year in the observed OECD countries.

5. ADDITIONAL DATA

Table 4: E-communications, energy, and transport price evolutions

	HICP all components		HICP communications price		HICP energy price		HICP transport price	
	Annual growth (%)		Annual growth (%)		Annual growth (%)		Annual growth (%)	
	2006-2008	2009-2011	2006-2008	2009-2011	2006-2008	2009-2011	2006-2008	2009-2011
AT	2.7	2.6	-3.6	1.3	5.8	4.5	-3.4	0.8
BE	3.1	2.9	-3.1	-1.1	12.1	12.4	0.5	3.5
BG	9.7	3.2	-0.4	-0.7	7.3	1.1	12.8	1.3
CY	3.3	3.0	0.0	1.6	8.5	19.5	5.2	-14.6
CZ	4.6	1.7	-0.3	-1.2	8.5	2.5	6.0	2.2
DE	2.5	1.8	-1.0	-2.3	7.5	4.8	4.0	2.8
DK	2.7	2.5	0.3	-1.6	3.9	7.2	4.8	0.8
EE	8.7	3.9	-1.1	-0.2	19.6	6.5	17.4	1.5
ES	3.5	2.5	0.9	-0.6	6.1	10.9	5.3	3.0
FI	2.7	2.5	4.3	-1.1	10.4	15.3	2.0	0.2
FR	2.4	2.0	0.0	-1.6	5.7	8.4	2.3	0.3
GR	3.6	3.9	-1.9	1.3	9.0	20.8	4.9	8.7
HU	7.0	4.3	-1.0	1.1	18.3	6.1	11.0	6.6
IE	3.0	-0.2	0.7	1.9	8.1	5.6	3.9	3.3
IT	2.8	2.3	-4.3	0.2	6.0	3.0	4.7	4.8
LT	8.4	2.6	-3.6	-4.1	15.5	9.3	12.4	1.6
LU	3.4	3.3	-0.1	0.2	8.6	8.4	1.6	1.4
LV	12.6	1.5	-5.3	-3.2	24.2	5.1	19.1	2.0
MT	2.7	2.3	1.6	-7.9	5.5	15.3	-1.8	0.8
NL	1.9	1.7	-3.8	2.1	3.6	-1.3	3.7	0.6
PL	3.4	3.3	-0.3	-1.1	6.7	5.7	3.1	6.0
PT	2.5	2.5	-1.7	0.8	4.0	8.0	4.0	4.7
RO	6.4	5.9	2.3	2.1	8.4	5.4	8.5	4.7
SE	2.5	1.6	-3.8	-1.2	4.5	3.0	3.6	1.4
SI	4.6	2.1	0.7	1.7	8.6	11.7	1.8	1.1
SK	2.9	2.4	0.3	0.4	3.3	2.6	6.1	5.2
UK	3.0	3.9	-3.0	4.5	12.7	3.4	6.8	10.1
EA	2.7	2.2	-1.2	-1.0	6.7	6.3	3.5	2.7
EU27	3.0	2.6	-1.0	-0.8	7.6	5.7	4.8	4.6

Source: Eurostat, HICP.

Table 5: Final decisions made on antitrust/cartels – 1999-2012*

		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Electricity	Clearance or rejection				1									1		2
	Clearance with remedies			2								3	2		1	8
	Prohibition, objection or fine										1				1	2
Gas	Clearance or rejection				2											2
	Clearance with remedies		1	2		3	1	2			1	1	3			14
	Prohibition, objection or fine						1					1				2
Rail	Clearance or rejection				1											1
	Clearance with remedies															0
	Prohibition, objection or fine					1										1
Maritime	Clearance or rejection	1					1				1		1			4
	Clearance with remedies				1											1
	Prohibition, objection or fine	1	1				1									3
Air	Clearance or rejection				2	2		1			1				1	7
	Clearance with remedies			1	2	1	1							1		6
	Prohibition, objection or fine	1+2**	1**	1									1			6
E-Comms	Clearance or rejection	2	1	1		2							1	1	1	9
	Clearance with remedies															0
	Prohibition, objection or fine					2				1		1		2	1	7

Source: Commission services. *decisions might not match the number of cases as they could involve several companies. Cases involving third countries are not included. **the case involves an authority not a company.

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ANNEX I – ELECTRONIC COMMUNICATIONS

As for **e-communications**, the liberalisation process characterising this industry at the EU level over the last decades has been a success in most regards, especially in terms of a combination of lower prices in specific segments, more competitive markets, and convergence of new technologies, engendering significant welfare gains, also in terms of consumers' benefits. The analysis of specific markets, such as roaming, mobile interconnection, and fixed broadband, reveals that a crucial role in the liberalisation process has often been played by the regulator both at the EU level and the national one, given the NRAs' implementation of the regulatory framework. Nevertheless, the same indicators revealing a global improvement of competitive conditions hint also at persistent differences among Member States in terms of price performance, market structure, consumer's choice, and implementation of the regulatory framework. In fact, high and not clearly decreasing over time dispersion measures in terms of both price performance (price disparities generally above 100% and coefficients of variation over 30%) and non-price performance (e.g. an enduring broadband gap across Member States) seem to confirm the need to step up efforts in order to achieve a genuine Single Market for electronic communications, so as to better reap the benefits of their liberalisations. The 2009 Third Telecoms Package and broader initiatives like the *Digital Agenda for Europe* seem to go in the right direction in terms of increased awareness of the need of a more integrated EU-wide regulatory approach. Still, the proposed analysis recognises that, due to the presence of significant national factors, no one-size-fits-all approach can be adopted, so that further in-depth analysis is indeed suggested of national eComms markets to come to a better understanding of the determinants of divergent performances therein

1. INTRODUCTION: ASSESSING INTEGRATION AND COMPETITION IN E-COMMUNICATIONS

This annex adopts an economic and regulatory approach to analysing the state of play of the so-called electronic communications (hereafter, *e-communications* or *eComms*) industry both at the Member States' and the EU level. In the hereby adopted definition of eComms services, these encompass: i) fixed voice telephony and Internet access and services; ii) mobile voice telephony and data services; iii) business data services; iv) pay TV. In fact, relentless technological developments, including convergence⁶⁴, have rapidly changed it into a multifaceted environment, where boundaries between traditional telecommunications segments and new ones like the Internet and media services are *de facto* vanishing. This issue is further compounded by the increasingly widespread diffusion of bundled services offers among the operators towards end-users, mostly impairing the possibility of a separate treatment of the underlying offers. Also in light of these challenges, Section 2 is devoted to providing a brief overview of the sector under scrutiny, namely in terms of recent trends as far as revenues, investments, and consumers' rights are concerned.

In Section 3 of this annex, some indicators are employed to assess the state of play of the European eComms markets in terms of market opening and integration, taking into account also the latest and on-going regulatory developments therein. To this aim, the chosen focus is twofold. Section 3.1 aims to assess the progress in terms of the liberalisation process of the national e-communications markets in the EU, based on indicators of market structure, price and non-price (e.g. broadband penetration) performance: the choice of these indicators takes into account the wholesale markets susceptible to ex-ante regulation under the regulatory framework as well as some significant retail markets. Section 3.2 discusses whether, and to what extent, the objective to reach a genuine internal market for electronic communications in the EU (hereafter, Telecoms Single Market) has been achieved. In fact, the whole analysis is underpinned by the awareness that any EU policy promoting competition and investments, including in eComms, is closely linked to the internal market objective. Indeed, the benefits of integration could contribute to offset operators' and regulators' compliance costs with harmonised rules and be a powerful engine for growth. To this aim, dispersion measures are reported and compared for some of the price and non-price indicators. The evidence of persistent differences among Member States in some price and non-price indicators is a further reason to investigate also the contribution of the *EU acquis* to the integration process. Last but not least, as understanding the determinants of the observed fragmentation, even beyond regulation, is crucial to reflect more on the impact of the EU-wide regulatory framework and the work of the NRAs thereon, a benchmarking table of the Member States' performances in terms of some relevant price and non-price indicators aims to identify some national eComms markets, which may deserve more accurate analysis. Section 4 concludes: the competition analysis of the European eComms reveals that the liberalisation has been successful under most regards, including price performance, especially compared with other network industries. On the other hand, however, despite the progress in terms of market opening, marked discrepancies persist among EU countries, which hint at the need to step up efforts in terms of integration in order to better reap the benefits of two decades of market opening.

Reflecting on the determinants of this situation is relevant also to clarify the extent to which broad objectives underlying the EU regulation on eComms have been achieved so far. Among these could be mentioned: i) ensuring effective competition to bring tangible benefits to consumers, also by lower prices for more varied services; ii) making a contribution to the promotion of investments and innovation in high-speed infrastructure and new services, including through efficient spectrum management; iii) safeguarding consumers' interests and rights. These targets are particularly relevant and meaningful when referred to the overall achievement of an EU internal market, including for e-communications: still, the evidence indicates that this wider target is still rather far from being fully attained as far as e-communications are concerned. Also for this reason, and despite the awareness that the regulatory framework is not the only determinant thereof, it seems relevant in terms of these objectives the increased awareness on the role played in the integration process by a more integrated EU-wide regulatory approach, not least in e-communications, as signalled by broader initiatives like the *Digital Agenda for Europe*. Indeed, deeper pan-European harmonisation could engender significant welfare gains, also in terms

⁶⁴ Telecommunications or network convergence describes emerging eComms technologies and network architecture used to migrate multiple communications services into a single network, which involves the converging of previously distinct media such as telephony and data communications into common interfaces on single devices. This process is thus measured by the degree whereby as diverse media as phone, data broadcast and ICT infrastructure are combined into a single seamless all-purpose network architecture platform, the most prominent example being IP convergence. Convergence services include VoIP, IP-TV, Mobile TV, replacing old technologies.

of consumers' benefits, relying on a combination of more competitive markets and convergence of new technologies.

2. STYLIZED FACTS IN THE EU E-COMMUNICATIONS SECTOR

2.1. DEFINITION, SIZE, AND EVOLUTION OF THE ECOMMS SECTOR

The definition of e-communications employed in this report is aligned to that adopted in European Commission (2012), which encompasses the following "carrier services"⁶⁵: i) all fixed voice telephony services and Internet access and services, ii) all mobile voice telephony and data services, iii) all business data services, iv) pay TV. This tries to take into account recent market developments that have made it increasingly hard to define eComms statically, given technology steady growth.

In fact, rapid technological progress and increased network convergence have transformed this sector into a multifaceted environment, where boundaries between traditional services like voice telephony and the increasingly widespread Internet and media platforms are *de facto* vanishing. *Box I.1* below provides further insight, also through practical examples, into this convergence process induced by technological developments and its consequences, including challenges imposed on policy makers that have to accompany this transition.

BOX I.1: FROM TELECOMMUNICATIONS TO ECOMMS, TECHNOLOGICAL DEVELOPMENT AND ITS CHALLENGES

Taking into account technological developments is crucial when dealing with eComms as *condicio sine qua non* for the relentless progress towards a genuine knowledge economy, shaped by the Internet and the media. Important steps therein have been: i) technological convergence of broadband connections with traditional telecommunications (copper) and broadcasting (cable) networks, and their subsequent compound annual growth by 40% in the OECD over 1999-2009; ii) greater emphasis laid on new generation access networks based on fibre optic technology. This matters also in that it is the interaction of these developments with marketing strategies and new business models that has allowed the Internet to shape the eComms sector. For instance, a good example from OECD (2011) of this Internet-fuelled interaction resulting in new eComms services is a Voice-over-IP (VoIP) call through Skype using a 3G smartphone: i) alongside fixed broadband, important developments have taken place in wireless communications thanks to the quality ensured to mobile broadband by third-generation and initial commercialisation of 4G networks standards; ii) 3G hand-held devices, coupled with the operators' practice to offer flat-rates in lieu of usage-based fees, have allowed vast commercial exploitation of new services on always-on high-speed broadband, like the VoIP offered by specific carriers; iii) as pointed out in OECD (2011), the "sponsored connectivity model" is a new business model replacing the direct relationship consumer-carrier in favour of more separation between wholesale and retail in the service provision: namely, the consumer paying for connectivity is not aware of the identity of the network provider that needs not be the user interface performing customer acquisition, management and billing (e.g. a 3G device to surf the Web).

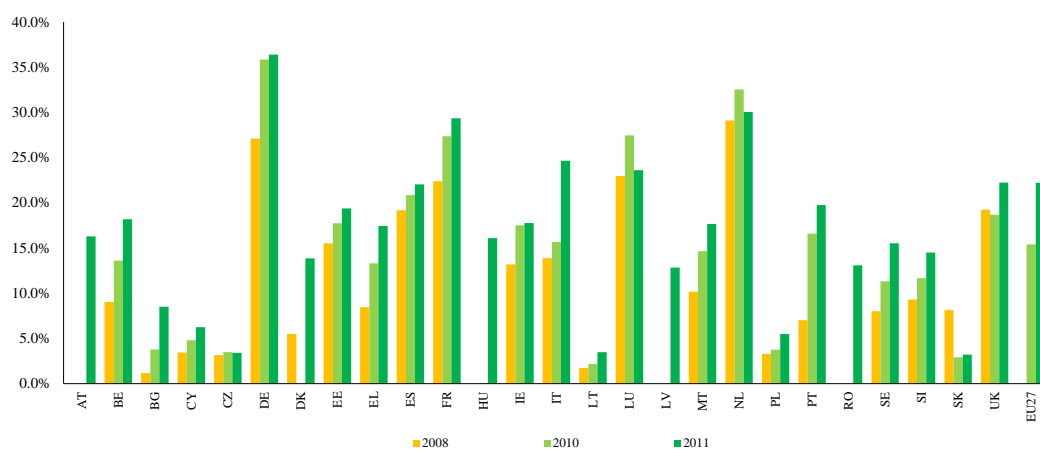
Technological developments matter also in light of potential spillovers from eComms to other sectors, improving their productivity and ultimately the sustainability of their growth models. E.g., broadband can serve as a complementary investment to other infrastructures (buildings, roads, health and electricity grids, transportation systems), allowing them to be "smart" and, for instance, save energy or improve safety. For instance, smart grids can innovate the ways electricity is produced, managed, and consumed, as ICT applications can allow structural shifts in its consumption and sustain its supply. Innovative smart meter, in fact, can on the one hand balance information asymmetries between producers and consumers, and stimulate informed conservation choices and reductions in "peak demand", thereby contributing to lower emissions; on the other hand, as for the "back-end" operations, innovative monitoring and networked IT systems can help limit losses, and enhance capacity utilisation. Yet, this convergence between energy and e-communications poses the challenges of changing connectivity requirements, adapting the role of operators as electricity sector partners, and ensuring interoperability and openness of smart grids while securing critical infrastructures and protection of individual privacy.

⁶⁵ This is the terminology adopted in *EITO (2011)*. Despite some differences, this definition is quite close both to that of "wireline, wireless, satellite, and other telecommunication activities" accounted for by the NACE.Rev2 category J61 of Eurostat and to the "telephone and telefax services" basket used in the HICP price index (including installation and subscription costs of personal telephone equipment, telephone calls from a private or public lines, telegraphy, telex and telefax services, information transmission and internet connection services). For these reasons, when data are not directly available for the chosen aggregate, it is deemed to be a reasonable approximation to refer the reported evidence to one of the latter definitions.

The technological progress entails also major challenges for policy-makers asked to accompany and foster the transition from telecoms to eComms and the regulatory framework has to be kept up with these changes. For instance, the convergence of telecommunications, broadcasting and the Internet, the emergence of cloud computing, and the eventual shift to “smart” infrastructures is placing pressure on existing resources, requiring both supply and demand-side interventions: on the one hand, stimulating private investment to ensure the availability of sufficient and affordable capacity despite the challenges in areas with low population densities; on the other, demand-side policies to upgrade and invest in areas such as health and education services, using the Internet as a platform to boost efficiency. These have been key objectives in the EU Growth and Competitiveness Agenda at least since the 2000 Lisbon Strategy, due to the awareness that a well-functioning eComms market is a prerequisite for the development of a ubiquitous information society and a platform for the creation of new market and services in diverse areas (e.g. health or education). To this aim, an EU-wide coordinated approach is considered crucial, given the contribution that a Single eComms Market could make to stimulate economy-wide competitiveness, innovation, and ultimately growth

This trend is further strengthened by the fact that eComms services are now mostly sold as bundles of services, often impairing the possibility to treat them separately even pricewise: this reflects, on top of business practices or path-dependencies⁶⁶, the mentioned convergence, whereby a large majority of eComms could be delivered over an IP-based broadband connection. In multiple-play offers, consumers choose between purchasing stand-alone services (e.g. broadband) or bundles thereof at a lower price than the sum of stand-alone ones, with the benefit of shifting their interest from a high-valued to a less-valued element and of being provided with extra services like unified billing and both technical and customer assistance. It is also worth noting that, thanks to the wholesale regulatory framework, service providers can differentiate their products towards end users usages and consumption patterns to provide a more customised offer to their needs. On the other hand, however, this trend may pose challenges for consumers aiming at comparing prices and make informed decisions, or simply seeing their ability to switch providers and drop a service impaired. Besides, on top of flat rates, bundle offers may keep prices at a lower level for providers. The magnitude of this phenomenon, despite differences among Member States due, e.g., to different consumers' preferences therein, is summarised by Graph I.1: the penetration of bundles in the EU grew by almost 45% between 2008 and 2011, with the highest subscription rate, close to 40%, in Germany, and the lowest, below 5%, in Czech Republic, Lithuania, and Slovakia.

Graph I.1: Penetration of bundled offers (subscribers as % of the population) in the EU27



Source: European Commission, DAS, (2012)

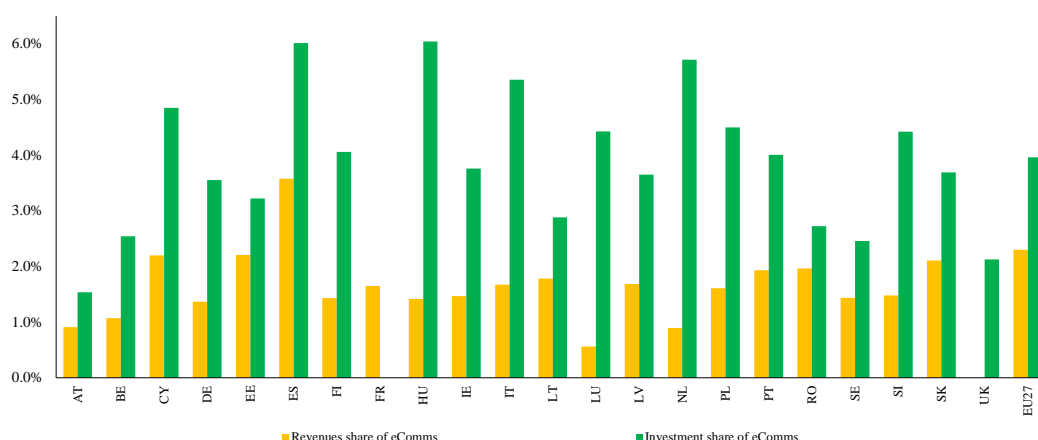
Overall, e-communications accounted in 2009 for close to 2% of the value added, 0.4% of the employment, and some 3% of consumers' purchases⁶⁷ in the EU27, and, as shown in Graph I.2, for some **2.3% in terms of revenues and 4% in terms of investments of the EU business economy**, with significant disparities across Member States. However, as the fact that eComms represent the neural system of the modern economy makes their economic relevance go well beyond their market share and encompass strategic complementarities exerted on the overall productive system. In fact, they are a general purpose technology playing a key role in providing inputs/facilitators for all other economic and social activities. E.g., the absence of a broadband connection may currently even impede the provision/export of certain services. Price and quality of e-communications are thus essential for the competitiveness of the EU industries, the well-functioning of the internal market, the living

⁶⁶ For instance, this may be true when it comes to broadcasting services in triple-play offers.

⁶⁷ See section 2 – Economic relevance of network industries – for these computations based on Eurostat. Shares in the business economy are computed as follows: total eComms investment and revenues in 2009 are taken from European Commission (2012) and compared, respectively, with total investments (correcting gross investments in tangibles by the country's ratio of intangibles to the gross fixed capital formation) and with the total turnover referred to the NACE Rev2 sectors B-N_X_K (business economy except financial and insurance activities). In fact, the sometimes proposed ratio of eComms revenues to GDP, amounting in 2010 to 2.7% and 4.6% of the total and business economy, respectively, likely overestimates the sectoral share, down to 1.5% when a more correct comparison with *output* is made.

standards of EU consumers, and, ultimately, for EU growth. In fact, a vast literature⁶⁸ shows the positive impact of e-communications developments (including investments) on productivity and growth.

Graph I.2: Share of e-communications in the total business economy revenues and investment (2009)



Source: Eurostat and European Commission, DAS, (2012)

To provide some further insight into the defined eComms sector, the rest of this Section analyses its latest trends in terms of revenues. Overall, Table I.1, reporting a detailed picture of the evolution of revenues by specific category of carrier services, although only with reference only to major EU operators⁶⁹, indicates that the recent financial crisis has affected also the eComms sector: after two successive years of downward trend, eComms performed slightly worse in 2011 (-1.3%) than in 2010, despite a GDP expansion of 1.5% at the EU level and an increase in worldwide revenues by 3.1% over the same period. From a geographic viewpoint, it is worth remarking that the EU operators reported a decline in their domestic revenues by 4.5% over 2010-2011, partially offset, however, by a 17.3% increase in foreign ones. In addition, the ratio of Capex to revenues increased by 0.4% and the EBITDA dropped by 4.8% over the same period. Overall, carrier services appeared to perform slightly worse than the more dynamic equipment segment (+2%), and recovery prospects remaining far from rosy at least for the next year (+0.1%). In detail, revenues grew in mobile data services (+9.8%), fixed internet access (+2.9%), and pay TV (+2.5%), yet fell in traditional fixed voice services (-7.1%) and mobile ones (-4.7%): in other words the most dynamic segment was the data market, whose growth between 2008 and 2011 (+34% for individuals and households, and rather stable for businesses, partially reflecting their slow take-up) helped to offset the concomitant renewed pressure on voice (-12.4%) despite the former's smaller revenue share (21.2%) than the latter (53.9%).

Table I.1: Total revenues (mn€) and % revenues growth, 2008-11 and forecasts for 2012

EU25 eComms markets	2008	2009	2010	2011	2012	GR 2008-09	GR 2009-10	GR 2010-11	GR 2011-12	GRf 2012-13	Share 2011
Total eComms	358 056	354 950	356 176	353 951	357 598	-0.90%	0.30%	-0.60%	1.00%	-0.04%	100.00%
Total eComms equipment	69 013	71 193	73 588	75 041	78 342	3.20%	3.40%	2.00%	4.40%	2.81%	21.91%
Total eComms services	289 043	283 757	282 589	278 909	279 256	-1.80%	-0.40%	-1.30%	0.10%	-0.86%	78.09%
Fixed Voice Telephony	75 052	69 125	63 895	59 329	55 915	-7.90%	-7.60%	-7.10%	-5.80%		21.30%
Business Data Services	20 675	20 704	20 477	20 564	20 799	0.10%	-1.10%	0.40%	1.10%		7.40%
Internet access & services	33 614	35 094	37 338	38 412	39 797	4.40%	6.40%	2.90%	3.60%		13.80%
Mobile voice telephony	103 900	98 714	95 499	91 042	88 308	-5.00%	-3.30%	-4.70%	-3.00%		32.60%
Mobile data services	28 686	31 546	35 055	38 485	41 709	10.00%	11.10%	9.80%	8.40%	5.40%	13.80%
Pay TV	27 117	28 575	30 326	31 078	32 729	5.40%	6.10%	2.50%	5.30%		11.10%

Source: based on EITO (2011)

Despite the globally negative economic outlook, however, Graph I.3 below allows to conclude that total sectoral revenues proved all in all resilient, subject to a y-o-y flection by 2.4% (from €335.24 bn in 2009 to €327.1 bn in 2010)⁷⁰. For instance, although revenues in the mobile segment underwent an overall decline of 3.5% between 2008 and 2011, this is due to the decrease in traditional voice services and an increase in data services, characterised, however, by a much lower profitability than voice ones.

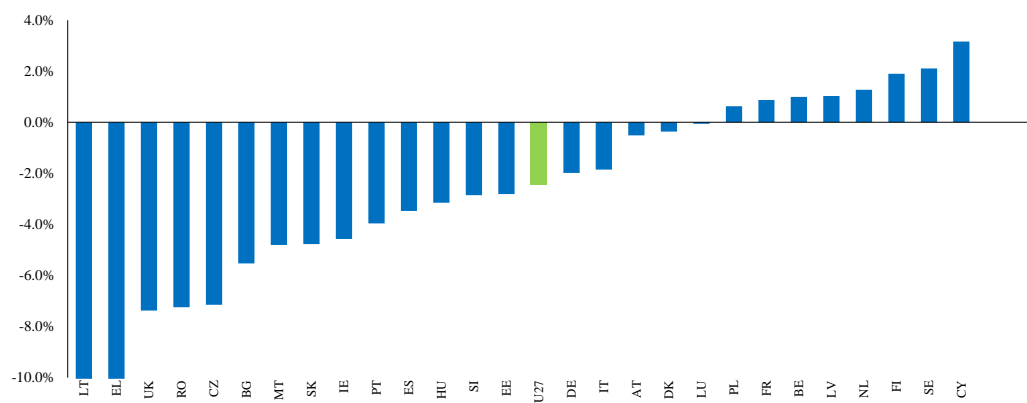
⁶⁸ See, for instance, Shiu and Lamb (2010).

⁶⁹ For more details, see EITO (2011) and EITO (2012)

⁷⁰ Despite the discrepancies among Member States, the negative trend in revenues is rather generalised, with the only (slight) exception of Belgium, Cyprus, Finland, France, Latvia, the Netherlands, Poland, and Sweden.

In terms of investments, Austria, Bulgaria, France, and Malta had the highest growth, and Greece, Hungary, Sweden, and Slovenia the largest contractions.

Graph I.3: Member States' growth rate of total eComms revenues, 2009-2010

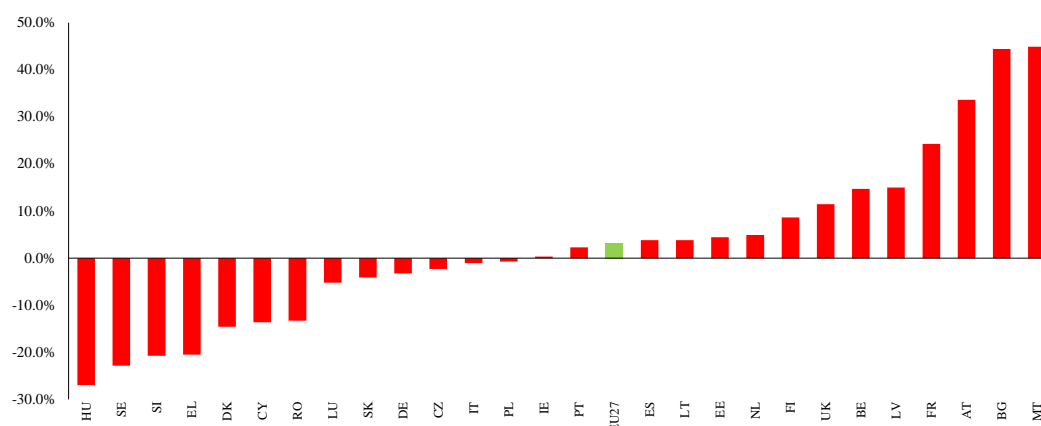


Source: European Commission, DAS, (2012)

2.2. INVESTMENTS AND STATE-AID RULES

In line with what already observed in Section 2.1 on revenues, the resilience of some eComms segments during the global financial crisis is confirmed also by the latest trends in their investments. In fact, as indicated in Graph I.4, eComms investments in the EU slightly increased by 3.2% (from €39.15 bn in 2009 to €40.4 bn in 2010) despite the mentioned contraction of revenues. As a result, as shown in Graph I.5, the investment share in revenues grew from 11.7% to 12.4%. The fact that this is likely due to investment in coverage and high-speed broadband is also revealed by the fact that the big funds needed to roll out NGAs prompted several major operators to team up in order to reduce Capex and operating costs⁷¹. This trend, on top of that of revenues, further confirms how Internet-related services and in particular broadband are becoming a core driving force in the growth of the eComms industry, making this segment as important as more traditional ones like mobile and fixed voice. In fact, competitive broadband is a general purpose technology supporting not only critical services but also innovation, competitiveness, and growth⁷²: it has been estimated⁷³, for instance, that a 10 pp increase in broadband penetration could entail annual GDP per-capita growth by 0.9 to 1.5 pp.

Graph I.4: Member States' growth rate of total eComms investments, 2009-2010



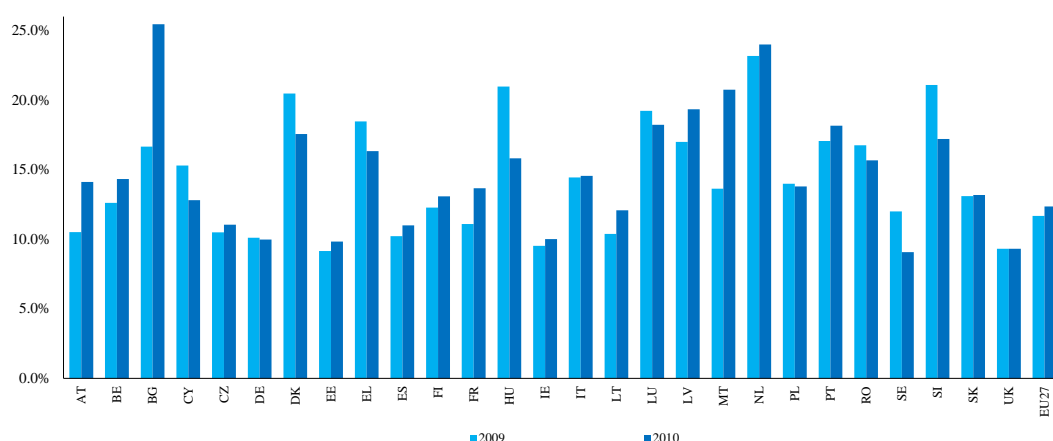
Source: European Commission, DAS, (2012)

71 European Commission (2012)

72 See, e.g., Taylor (2009)

73 Czernich and al. (2009)

Graph I.5: Revenue share of eComms investments, 2009-2010



Source: European Commission, DAS, (2012)

Overall, investments in broadband platforms have been mostly undertaken by private telecommunication operators, until the crisis gave renewed emphasis to the public stimulus spending on broadband infrastructure. This can be partially explained by the operators' more limited access to capital and by the observed pro-cyclical nature of these investments over the last two decades. For these reasons, the rest of this Section will provide further insight into investments in broadband infrastructure, putting emphasis on the public support to its deployment. In fact, at this stage private and public funding seems to have fallen short the investment required to meet the targets of the *Digital Agenda for Europe* whereby all Europeans should have access to basic broadband (i.e. with speed between 144Kbps and 2Mbps) by 2013, and to fast one (i.e. at least 30Mbps) by 2020, with ultra-fast (i.e. at least 100Mbps) take-up of at least 50%. This explains also recent Commission's initiatives like the revision of State aid guidelines on broadband deployment and a Regulation proposal to reduce the civil costs thereof⁷⁴.

Specifically, with the respect to the DAE target to provide basic connections to all households in by 2013, 95.7% of EU households already have at least a basic fixed broadband connection, with full coverage achieved by Denmark, Finland, France, Luxembourg, Latvia, Malta, the Netherlands, and the United Kingdom. Important progress can be traced in terms of fast and, to a lesser extent, ultra-fast coverage, grown from 28.7% in 2010 to 50% in 2011. Nevertheless, these improvements, mostly driven by cable upgrade, have been concentrated in some Member States and urban areas, and, indeed, the actual take-up of fast broadband remains instead very low: around 8.5% of all subscriptions, of which only 15.3% above 100Mbps. On top of this, although 22 Member States have stepped up their efforts to make broadband a political priority through national plans and regulatory remedies, the level of ambition varies greatly among them⁷⁵.

For this reason, the predominant focus of public funding for broadband roll-out, either from national budgets or structural and rural development funds⁷⁶, is above all closing the still existent *broadband gap* across Member States and bridge the *funding gap*⁷⁷, whereby private operators' investments alone will not yield the desired outcome, including in terms of upgrading networks to support competitive services in local administrations and extending access to unserved/underserved communities. In fact, there exists a trade-off between economic considerations (costs) and social objectives when tackling these market failures: e.g. extending access in remote areas by high-speed backbone may have lower impact on aggregate productivity growth per unit invested than last-mile connectivity enhancements, yet it responds to equity principles. Anyhow, public support should reach these targets without displacing private investment: as governments generally do best when they support innovative and robust private participation, national plans should specify the private sector's leading role in ownership and operation of the networks receiving public investment.

⁷⁴ This forthcoming initiative (listed in COM(2012)573 final, page 13) looks at ways to facilitate and reduce the cost of rolling out high-speed Internet networks, of which up to 80% is estimated to consist in civil engineering costs. Since a major part of these costs can be attributed to inefficiencies in the deployment process, the proposal aims at significantly reduce some of these inefficiencies and thereby the deployment costs by implementing simple measures, such as a more intensive use of existing passive infrastructure, cooperation with utility companies, and improved coordination of all the actors involved in network rollout.

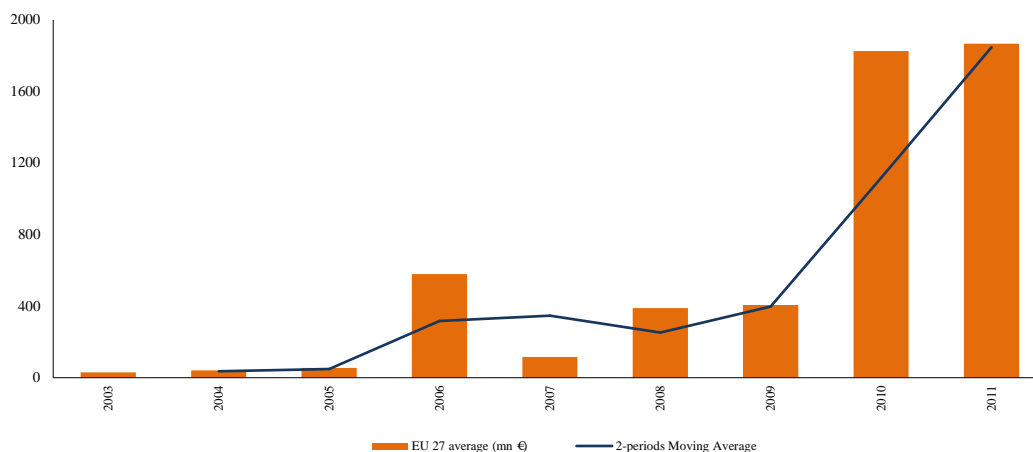
⁷⁵ E.g., while 6 Member States still lack any quantitative target, Luxembourg has put the ambitious objective of 1Gbps speed.

⁷⁶ In fact, investments in broadband networks also form a crucial part of the European Economic Recovery Plan (see IP/08/1771), for which the Commission has provided €1.02 bn through the European Agricultural Fund for Rural Development to develop broadband in rural areas.

⁷⁷ Namely, it is estimated that this could reach €100-200 billion for providing fast and ultra-fast internet access for all European citizens (COM(2011)276 final). Similar amounts were calculated by EIB and various think-tanks

To this aim, the Commission is planning to focus different financial instruments on the achievements of the DAE targets, including structural and regional funds and possible credit enhancement backed by the EIB, and under the *CEF framework* a plan has been adopted for a €50 bn boost to EU's transport, energy and digital networks between 2014 and 2020, out of which €9.2 bn for broadband. Besides, the Commission's 2009 *Broadband Guidelines*, providing guidance on how public funds can be channelled for the deployment of basic broadband and NGA networks to areas where private operators have no plans to invest, in accordance with EU state-aid rules, are currently being discussed in view of their imminent revision⁷⁸. As shown also by Graph I.6, in fact, authorised State-aid has acquired growing importance since 2003 in contributing to bridge the broadband divide.

Graph I.6: evolution of yearly EU State aid for broadband (in mn €), 2003-2011



Source: Commission Services

The current guidelines outline the distinction between competitive areas ("black" areas), where no state aid is necessary and unprofitable or underserved areas ("white" and "grey" areas) in which state aid may be justified, if certain conditions are met. This distinction is then adapted to the situation of NGA networks by requiring Member States to take into account not only existing NGA infrastructures but also concrete investment plans by operators to deploy such networks in the near future. A number of crucial safeguards (such as detailed mapping, open tender, open access obligation or technological neutrality and claw-back mechanisms) are laid down in the Guidelines: for instance, an obligation to provide effective wholesale access for at least 7 years to any network receiving State-aid. Currently discussed revisions include: i) strengthening network openness as a *quid pro quo* for State aid, requiring a passive, neutral and open infrastructure for NGA; ii) tightening the Member States' obligation to consult the NRA when granting aid especially for ultra-fast networks, given their expertise in implementing access conditions attached thereto; iii) reduced cost of retrieving information for third party operators seeking access to subsidised networks through a deepened transparency obligation; iv) the possibility, under strict criteria, to allow aid to the deployment of ultrafast NGA (above 100 Mbps) even in "black" areas. The changes should strike a balance between public intervention, in particular as regards NGAs, and distortions of competition therefrom.

2.3. USERS' RIGHTS IN ECOMMS

The abovementioned issue of public support as far as broadband is concerned matters also in terms of users' rights. In fact, the *Universal Services Directive* defines a universal service obligation (USO) whereby Member States must provide access to a minimum set of services of specified quality, at an affordable price and without distorting competition, including: i) connection to the public telephone network at a fixed location enabling end-users to take charge of voice communications, facsimile communications and data communications at data rates allowing functional Internet access; ii) special measures for disabled users ensuring that they enjoy equivalent service standards and functional levels as any other. In order to compensate for the net costs to which the USO may give rise, compensation mechanisms for operators subject to USO may exist, either with public funds and/or sharing costs between providers of eComms networks and services.

78 C(2012)9609/2.

While a USO policy was first introduced to ensure that every citizen had access to telephony services including in areas that may not otherwise have been served by the deployment of public payphones, the USO directive foresees regular reviews in order to decide whether broadband should be considered an element of it, as the framework does not specify a data rate to access online services. In fact, bridging analogue and then digital divides is essential to allow also low-income users or rural or remote areas to participate in economic and social interactions. On this, while one of the underlying goals of the *DAE* is to ensure a basic broadband connection to all households by 2013, the question whether USO is the best way to achieve it has been answered differently by the Member States. In fact, only a few have chosen to include broadband as a specific users' right enforceable by legislation, while most simply decided to foster broadband deployment to extend coverage in rural areas or subsidise connections for people with special needs⁷⁹. Mobile broadband has also been the target of public policy concerns, with coverage obligations included in spectrum tendering processes and coverage milestones and deployment speed among the criteria evaluated in the context of licensing procedures⁸⁰. In 2013, the Commission will issue a Recommendation on universal service to promote the most efficient and appropriate approach of implementing the EU universal service rules as a safety net to bring the benefits of the digital society to end-users, in particular in a broadband environment. The aim is to foster the development of the single market for electronic communications by contributing to regulatory certainty and improving consistency in the way the Member States apply the EU regulatory framework for electronic communications with regard to the provision of universal service.

More broadly, precisely in light of the mentioned technological spillovers (see *Box I.1* in Section 2.1) adequate eComms services and infrastructure are nowadays crucially related with the consumers' possibility to exercise their own rights also everywhere else. Some examples are e-health, e-safety, as well as the strong positive correlation (0.85) found⁸¹ between broadband penetration and the level of online shopping, which hints at the advantages that further NGAs could entail also in terms of progress towards a genuine EU retail internal market, with significant room for further integration. Indeed, the growth potential of ecommerce appears largely untapped in the EU, and boosting it as part and parcel of a full-fledged internal market for eComms may contribute to consumers' welfare through their empowerment and a mix of wider choice, better quality, and lower prices allowed by integration and economies of scale.

Given the mentioned importance of the USO in e-communications, it seems worth noting that, as indicated in section 4 – Market Opening in network industries, state of play- , the Market Performance Indicator⁸² denotes the existence of considerable room for improvement in terms of consumer satisfaction not only in fixed and mobile telephony but, above all, as for Internet provision. Table I.2 provides further insight into the reasons for the mentioned underperformance in terms of MPI, by showing that, especially for mobile telephony and Internet provision, eComms were systematically perceived in 2011 worse than the average product/service in the EU27 in terms of all the four dimension of the MPI: i) comparability among offers and subsequent ability to make informed decisions on price and quality; ii) confidence that the provider complies with the consumer legislation; iii) overall match with consumers' expectations; iv) problems experienced with the service/provider and complaints lodged therefor.

Table I.2: 2011 Market Monitoring survey results for eComms

2011 Market Monitoring Survey Results	Comparability of services/products		Trust in suppliers/retailers		Overall satisfaction		Problems experienced with service/product		Complaint lodged due to problem severity		Ex-ante perceived ease of switching		Ex-post perceived ease of switching		Actual switching in 2010	
	% of respondents		% of respondents		% of respondents		% of respondents		% of respondents		% of respondents		% of respondents		% of respondents	
	very low	low	very low	low	very low	low	yes in 2011	yes in 2010	no	yes to supplier	very low	low	very low	low	product/service	supplier/provider
Fixed Telephony Services	14%	38%	18%	42%	10%	35%	17%	15%	13%	73%	16%	39%	15%	27%	9%	9%
Mobile Telephony Services	17%	35%	24%	40%	9%	38%	21%	19%	11%	78%	13%	36%	16%	24%	14%	11%
Internet Provision	15%	38%	19%	42%	10%	38%	26%	26%	9%	82%	15%	39%	20%	30%	10%	10%
EU average for all market	12%	35%	14%	41%	7%	35%	11%	11%	19%	67%	18%	38%	12%	21%	7%	9%

Source: based on European Commission, Consumer Scoreboard (2011).

The latter aspect appears particularly serious, with more than a quarter of consumers having problems with the Internet and more than one fifth with mobile services, whose severity is witnessed by the highest propensity to complain officially about them. The four MPI dimensions are interestingly completed by an analysis of the perceived/experienced easiness of switching provider or services within the same provider, which matters as in indicator of competition and because actual switching rates were higher than the EU average in 2010, especially

79 For instance, Finland decided already in 2008 to extend the USO to broadband by legally setting minimum-speeds for connections; the UK government committed to universal service provision of at least 2 Mbps broadband by 2015; in France, the *France Numérique 2012* plan sets a target of full broadband access by 2012 through the creation of a certificate to providers offering a minimum of 512 Kbps at an affordable price.

80 E.g., in the United Kingdom the NRA threatened to shorten the license validity, should coverage obligations not be met.

81 See the Commission's *Consumer Conditions Scoreboard* (2012)

82 The MPI is a composite index based on the results of survey questions on four equally-weighted key aspects of consumer experience, i.e.: i) ease of comparing goods/services; ii) consumers' trust in retailers/suppliers to comply with consumer protection rules; iii) experienced problems and the degree to which they have led to complaints; iv) consumer satisfaction (the extent to which the market lives up to what consumers expect). The MPI provides a "signal" of how consumers perceive markets rather than a full assessment of their functioning.

for mobile telephony⁸³ and Internet. It is worth observing that, while *ex ante* the average consumer does not expect switching in eComms to be more difficult than in different markets, the perception is reversed after having experienced the switching, especially for the Internet: the share of those who found it very difficult increases for mobile and Internet and becomes anyhow higher than the average.

3. ANALYSIS OF COMPETITION AND INTEGRATION

The objective of this section is to provide further insight into the state of play of the European eComms markets in terms of competition and integration, having regard to both the level and the dispersion of a set of relevant indicators of price and non-price performance, market structure, and operators' conduct. Without any ambition to be exhaustive, the analysis will however provide a global overview, taking into account also the latest regulatory developments in EU eComms, and recall, whenever needed, useful technical notions in separate boxes for the sake of readability.

3.1. COMPETITION ANALYSIS OF THE NATIONAL ECOMMS MARKETS

In the last two decades, the e-communications industry has been characterised by a global trend towards increased market opening, on which a recent overview is, for instance, given by the OECD⁸⁴. In particular, after the end of monopolies, the liberalisation process has reduced eComms prices thanks to a virtuous interaction between encouraged competition among different services, including more and more wireless platforms, and technological progress. In fact, while the immediate outcome of the liberalisation process of value-added services was stronger retail competition, which would subsequently favour the spread of the Internet, technological developments foregrounded also: i) the debate on *vertical separation* of telecommunication networks, either functional or structural, to further encourage competition, as previously undertaken in other utilities like electricity; ii) the issue of whether the liberalisation of infrastructures should ultimately lead and allow operators to lay down their own networks capable of competing with existing ones. These trends have gradually paved the way to stronger *platform competition* in eComms, on which *Box I.2* provides further insight.

BOX I.2: PLATFORM COMPETITION IN E-COMMUNICATIONS

So-called *platform competition* occurs when different e-communications technologies compete to provide equivalent services to end-users: this has been an important feature of the sector over the last twenty years. Examples thereof include: i) cable vs. PSTN; ii) wireless vs. wireline networks; iii) competing wireless options like satellite vs. cellular and, within cellular, competing digital standards; iv) direct broadcast satellite vs. cable networks; v) competing instant messaging services.

In the case of broadband services, which can be offered to end-users over multiple networks (DSL, cable modem technologies, optical fibre, and wireless), it has been indeed the regulatory policy to give rise to three major and usually co-existing modes of platform competition:

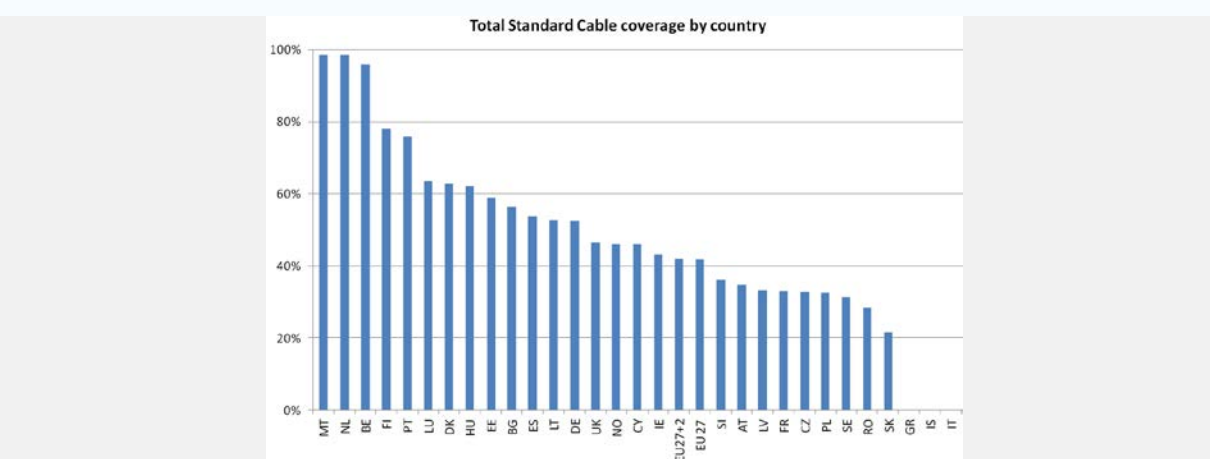
- 1) Without mandatory access to the incumbent's network, inter-platform competition can take place with infrastructure-based operators on alternative platforms (especially cable, but also fibre and wireless).
- 2) Imposing and regulating access to the incumbent's network, intra-platform competition can take place with different DSL operators on the incumbent's network, in two different forms:
 - 2.a) Service-based competition if entrants are merely reselling the incumbents' services and thus incur few investment themselves, as in the case of bit-stream access (whereby the incumbents' wholesale product consists of transmission capacity allowing the entrant to offer the consumers its own services) or mere resale of services offered by the incumbent (the entrants retail DSL products bought at wholesale prices).
 - 2.b) Facilities-based competition if entrants lease bare bundled local loop elements but have to invest in their own equipment and facilities, as in the case of local loop unbundling (LLU, whereby the entrants install their own transmission equipment

⁸³ The behaviour of this market, where consumers mostly choose to switch tariff plan while remaining with the same provider, differs from the others, where most consumers switch supplier rather than service.

⁸⁴ OECD (2011)

and network elements necessary for backhauling traffic) or shared access (whereby the entrants have to install only their own transmission equipment, as cooper pairs are shared with the incumbent, e.g. using high-frequency channels on the same line to provide broadband services);

The degree of these forms of competition varies across Member States, depending on both national (e.g. geography and topology of legacy infrastructure) and regulatory factors (regulated contractual access service conditions, and the level of regulated access prices) factors influencing the presence of alternative infrastructure. On this, the most salient distinction at the EU level is that between cable and non-cable Member States. In particular, Belgium, Malta, and the Netherlands can be fully qualified as cable networks countries, and Finland and Portugal also have a significant coverage of cable, as indicated in the Graph below; in all other countries the coverage is much lower, between 60% in Denmark, Luxembourg, and Hungary and virtually 0% in Greece and Italy.



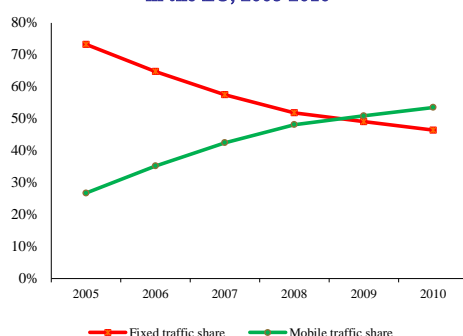
The distinction between cable and non-cable countries matters also in that the absence of alternative infrastructure increases the relevance of regulated access to the existing DSL one. The EU and national regulator plays, in fact, a crucial role in terms of platform competition and related investment incentives. E.g., the "ladder of investment" is a regulatory approach used by NRAs to foster platform competition by forcing incumbents to open several access levels, or "rungs", in their networks to induce alternative operators to climb them up, and use more and more their own infrastructure rather than relying on the incumbents' wholesale products. Besides, while the regulatory framework and the Digital Agenda targets require NRAs to promote efficient investment and innovation in new enhanced infrastructures, there may be trade-offs between maximising static and dynamic efficiency: this urges to identify network parts where the costs of duplication would unlikely be offset by the dynamic benefits of competition.

Let us now consider some competition-related indicators referred to the different segments (mobile, fixed, and broadband) of the eComms industry in the EU, in order to draw some conclusion in terms of market opening therein.

3.1.1. Competition in the mobile voice market

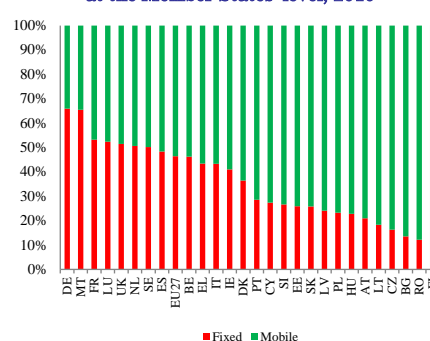
The mobile segment is nowadays the primary communication access path in the EU, with 638.1 million subscriptions (127% penetration) in 2011, up from 386.6mn (84.6% penetration) in 2004: the highest levels are in Italy, Latvia, and Finland, and the largest growth over the last year in Finland, Estonia, Malta, and Bulgaria. This global positive trend is reflected in the voice traffic shares represented in Graph I.7a and I.7b, where mobile has finally outpaced fixed access, despite marked differences among Member States: in 2010, in fact, the share of mobile voice was more than 80% of the total traffic in Finland, Romania, Bulgaria, and Czech Republic, yet remained well below 40% in Germany and Malta.

Graph I.7a: fixed and mobile Voice traffic in the EU, 2005-2010



Source: European Commission, DAS, (2012)

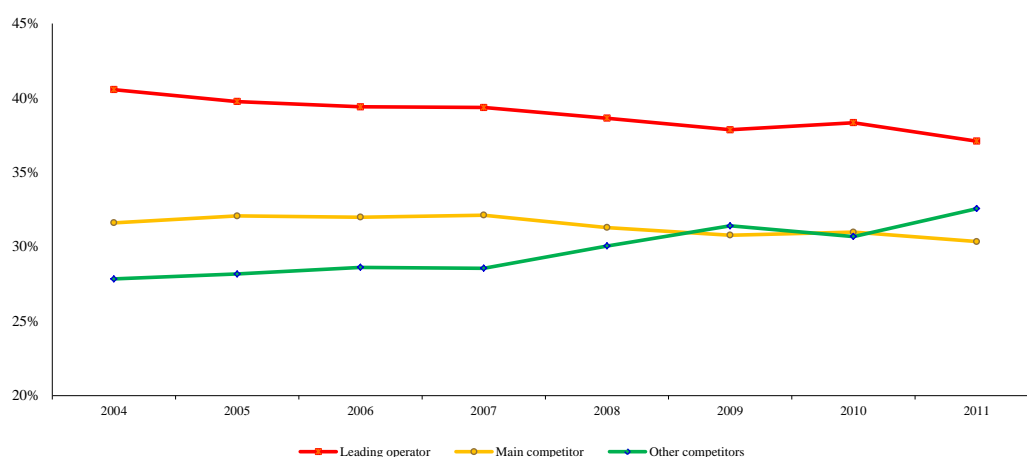
Graph I.7b: fixed and mobile Voice traffic at the Member States' level, 2010



Source: European Commission, DAS, (2012)

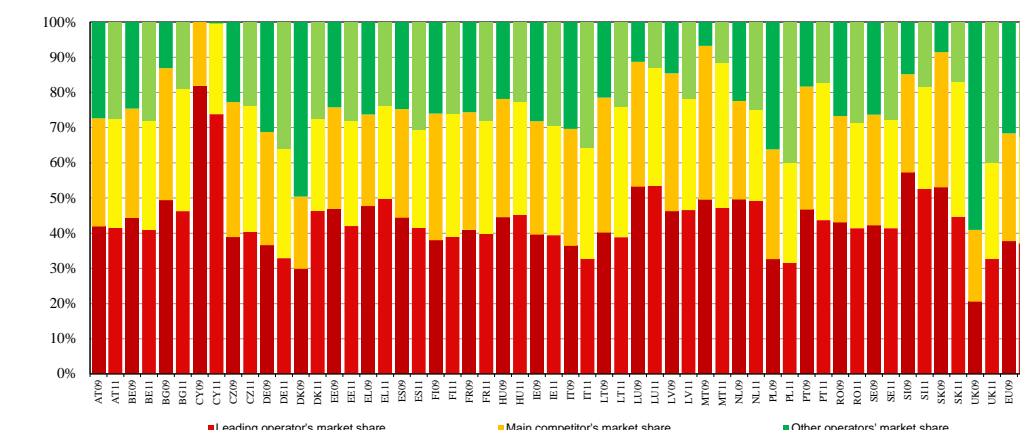
The mentioned increasing prominence of the mobile segment makes it even worthier noticing the gradually improved competitive conditions therein over the past years. In fact, as shown in Graph I.8, the EU-level market shares of both the leading operators and their main competitors have slowly decreased over 2004-2011, respectively by 8.6% and 4.1%, in clear favour of alternative operators (+17.2%). Nevertheless, marked differences remain among Member States, as indicated by Graph I.9. In fact, although the downward trend of the main operators' market power is rather generalised, with the only exceptions of Czech Republic, Denmark, Greece, Finland, and the United Kingdom, their market shares in 2011 ranged between 32-33% in Poland and the United Kingdom and 74% in Cyprus, compared to a 37% EU average. In Belgium, Spain, and France entrants based on newly obtained licences and MVNOs have either entered during 2011 or prepared for entry foreseen in 2012.

Graph I.8: EU average mobile operators' market shares, 2004-2011



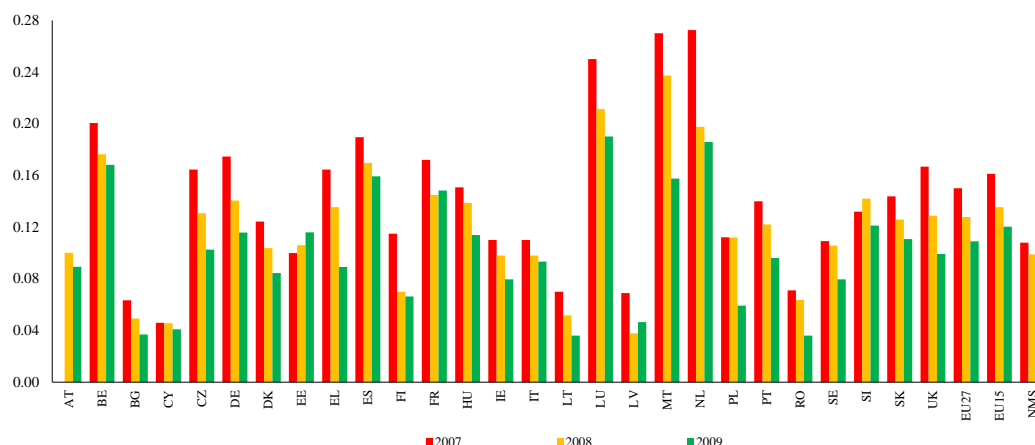
Source: European Commission, DAS, (2012)

Graph I.9: National mobile operators' market shares, 2009-2011



This evolution in terms of market structure is in line with that of retail prices, namely the average price per minute of voice communication⁸⁵ represented in Graph I.10, which clearly indicates a marked downward trend, by more than 26% at the EU level, between 2007 (0.15€) and 2009 (0.11€). This reflects a more pronounced decrease, by some 36%, in new Member States⁸⁶, starting in 2007 from an absolute level close to one third lower than the EU15.

Graph I.10: Average price per minute (in €) of mobile voice communications, 2007-2009



After analysing retail prices, let us now focus on wholesale ones, namely the interconnection charges for terminating calls on mobile networks, also known as mobile termination rates⁸⁷ (MTRs, hereafter). It is worth recalling that, under the *Access Directive*, NRAs should secure adequate access, interconnection and interoperability of services: operators are thus generally free to negotiate interconnection terms, subject to a general obligation of transparency and good faith as well as any further rule imposed by NRAs like cost-oriented price controls imposed on significant market power (SMP) operators. On this, the Commission adopted in 2009 a *Recommendation on MTRs*, laying down guidelines to be taken into "utmost account" by EU telecoms regulators on the cost-based method underpinning the calculation of MTRs, based only on the real costs that an efficient operator would incur to establish the connection. The main reason for this integrated EU soft regulatory intervention was that MTRs were, on the one hand, much higher than fixed ones, for instance 8.29 € cents/minute versus 0.48-0.86 €cents/minute at the EU level in 2008, on the other also more divergent across

⁸⁵ In European Commission (2012), the average price per minute of voice communication (APPM) is defined until 2009 as the ratio of the mobile voice revenues to the total outgoing minutes of voice communication (excluding VAT but including access charges). In 2010, instead, the average revenue per minute of voice communications (ARPM) is defined as the ratio of all retail voice-related revenues to the total outgoing retail voice minutes regardless of the call types: since there are specific cases, like in the widespread presence of bundled offers, where APPM and ARPM can significantly differ, the analysis of absolute prices is presented over 2007-2009 and supported by that of OECD mobile basket. Nevertheless, when dispersion measures are computed and the distribution matters more than the level, the two price indicators are considered together over 2007-2010.

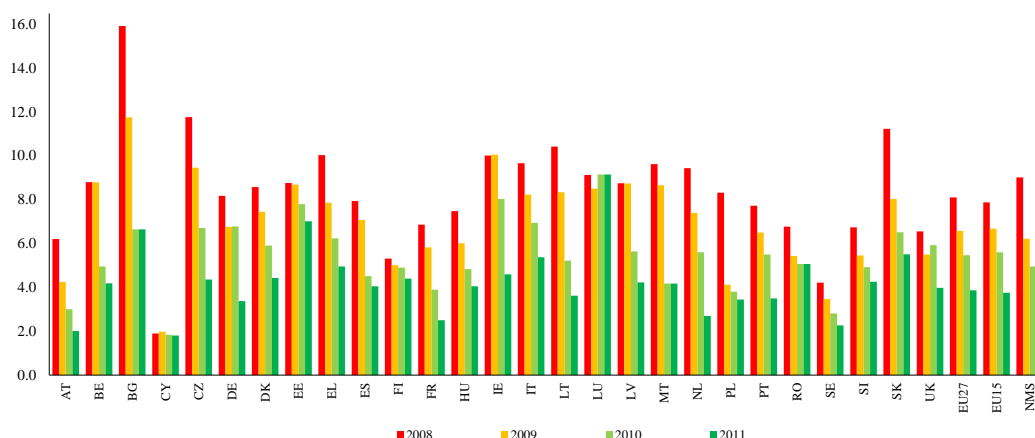
⁸⁶ New Member States (labelled NMS in the chart) include Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Malta, Poland, Romania, Slovenia, and Slovakia

⁸⁷ MTRs are the wholesale interconnection fees charged by operators to connect the call from another operator's network and part of everyone's phone bill.

Member States, ranging from 2 (Cyprus) to 16 (Bulgaria) €cents/minute "despite efforts by some national regulators to bring termination rates closer to their real costs"⁸⁸.

In terms of absolute levels⁸⁹, the purpose of the Recommendation was to make MTRs converge to a considerably lower level, towards some 1.5 to 3 €cents/minute by end-2012, in order to align MTRs with costs and stimulate competition⁹⁰. On this, the latest evidence reported in Graph I.11 shows that, as of October 2011, MTRs ranged from 1.81 (Cyprus) to 9.15 (Luxembourg) €cents/minute, which is rather far from the envisaged target range, but corresponds indeed to a marked reduction by more than 53% at the average EU level, from 2008 (8.29 €cents) to 2011 (3.87 €cents).

Graph I.11: Average mobile termination rates (in €-cents), 2008-2011



Source: European Commission, DAS, (2012)

Overall, the EU-wide evidence, i.e. the declining market shares of market leaders and lowering in retail prices, indicates improved competitive conditions through considerably reduced interconnection charges, despite enduring and even widening differences among Member States: this may well signal national differences in the pace of market opening through the NRAs' implementation of the ex-ante EU regulatory framework.

Another "non-price" aspect which also contributed to improved competitive conditions in the mobile segment is number portability. Specifically, the current rules thereon, set out by the *Universal Service Directive*, aim at facilitating the change of provider within the EU by asking Member States to ensure that all requesting subscribers can retain their number irrespective of the service provider, at a specific location for geographic numbers and at any location for non-geographic ones; NRAs should also ensure that related charges be cost-oriented and do not hinder competition or discourage subscribers from changing provider. Furthermore, porting of numbers and subsequent activation is to be carried out "within the shortest possible time": namely, subscribers concluding a porting agreement should have the number activated within one working day and, anyhow, the so-called *downtime* (i.e. the period in which the subscriber does not have eComms services from either the donor or the recipient operator) shall not exceed this limit.

Overall, number portability has played an important role, especially in the mobile segment, in making operator switching easier and faster, despite significant national differences (see Section 3.2.2): this matters both in competitive terms, as it tends to boost market entry, and as far as consumers' rights are concerned (see Section 2.3.1).

3.1.2. Competition in the fixed voice market

The fixed voice segment will be hereby only briefly analysed in light of the challenges posed to it by the technological and market developments analysed in Section 2. In particular, the constantly decreasing relevance

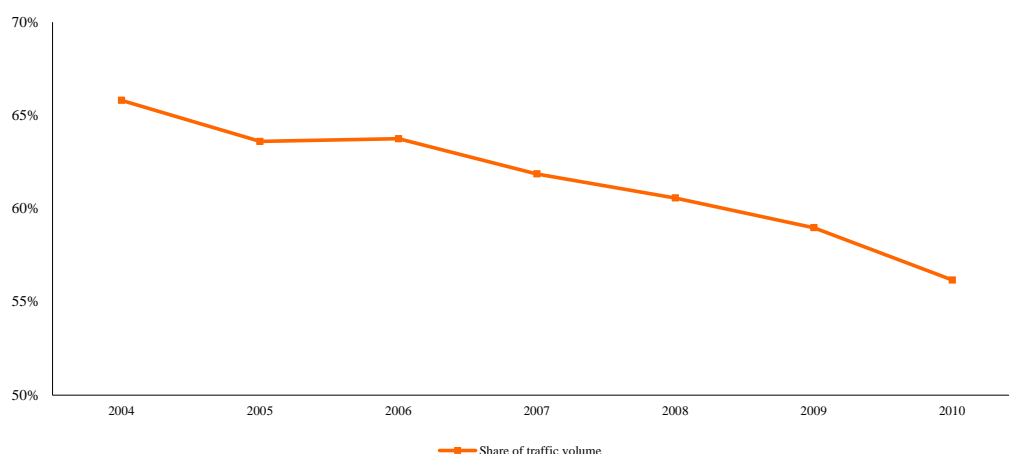
⁸⁸ See http://europa.eu/rapid/press-release_IP-09-710_en.htm for the press release and, for the Recommendation, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:124:0067:0074:EN:PDF>.

⁸⁹ The second issue, i.e. the dispersion of MTRs, will be analysed in Section 3.2 on integration.

⁹⁰ More precisely, as mentioned in the press release, it was estimated that, over 2009-2012, as regulators align with the more consistent approach outlined in the Recommendation, smaller mobile operators, typically net senders of call traffic to other networks, could expect to pay less to their larger competitors, fixed operators could get at least €2bn of additional revenue by paying lower, cost-based termination rates for fixed to mobile calls and consumers are expected to save at least €2bn. Moreover, the longer-term impact was expected to be even bigger, as operators could generate new revenue, new entrants have the incentive to access the market, and consumers benefit from lower prices and greater service innovation.

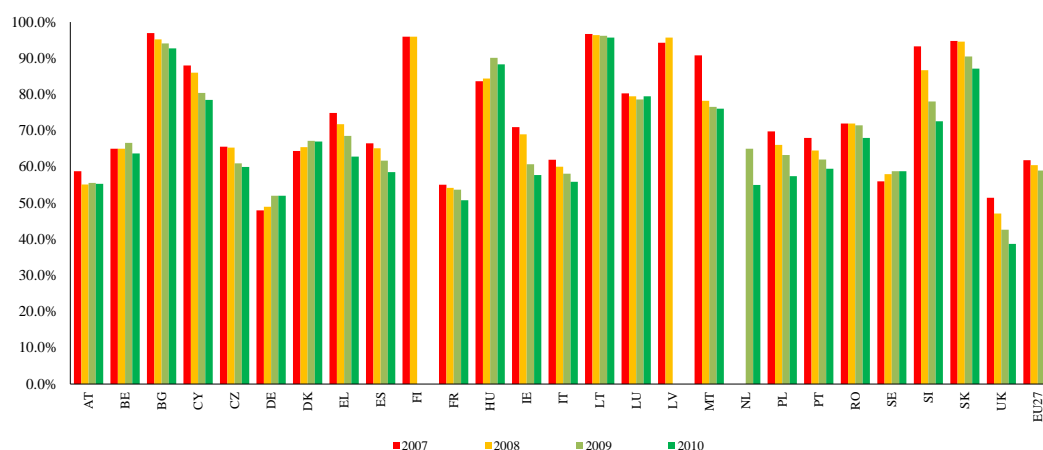
of this segment in terms of both traffic and revenues with respect to mobile telephony and data services, as well as the difficulty to correctly interpret the latest evidence on it given the increasingly diversified forms of platform competition faced by the traditional PSTN⁹¹. Overall, market shares in the fixed voice segment have been characterised by the same downward trend witnessed by the mobile one: namely, a decrease at the EU level from 65.8% in 2004 to 56.2% in 2010, as indicated in Graph I.12, but with marked differences among Member States shown in Graph I.13, where the incumbent operators' market shares range from 38.7% in the United Kingdom to 92.7% in Bulgaria. Anyhow, one should take into account that, differently from the competitive mobile segment, in the fixed voice most changes took place well before 2004, with the end of the monopolies therein.

Graph I.12: Incumbent's market shares in fixed voice in the EU, 2004-2010



Source: European Commission, DAS, (2012)

Graph I.13: National incumbent's market shares in fixed voice, 2007-10



Source: European Commission, DAS, (2012)

Despite the mentioned difficulties and *caveats*, retail and wholesale prices in fixed voice are also reported for the sake of completeness. Graph I.14 shows that the clear downward trend observed in retail prices of mobile telephony is much less evident in the fixed segment, where, interestingly enough, a drop by 69% in the price of national calls over 1998-2008 and a decrease by 11.2% in that of local calls over 1998-2006 are followed, between then and 2010, by a rebound in national and local charges, respectively by 6% and 18.8%: the latter even reached higher levels than in 1998. Although one should take into account that these figures hide a certain real price reduction also in such segment, the reported evidence of nominal price rebound can be considered the result of several factors: in particular, while local charges are still much lower than mobile prices, which may

91 For instance, as far as fixed voice is concerned, the incumbent operators' market shares at the national level reported by European Commission (2012) will tend to be overestimated, as all voice over broadband services are not taken into account in computing them. Nevertheless, these are reported as the main focus of the Section is the (downward) trend in market shares signalling improved competitive conditions rather than the level *per se*. The difficulties become even more evident when it comes to prices, given the increasing diffusion of bundled offers including voice telephony over broadband.

explain why they are not declining, national charges decreased also in light of competition from mobile. Overall, however, fixed voice is in a different stage of its life-cycle than mobile, characterised by different operators' strategies, and where a shift of competition towards alternative segments of the eComms markets like fixed broadband and mobile services as well as the increased diffusion of bundled offers is making stand-alone prices less of a competitive factor.

Graph I.14: National and local call charges (10 minutes) in 1998-2010, EU level.



Source: Teligen (2010)

In order to better reflect this aspect, Graph I.15 shows for each Member State an estimate of the monthly expenditure on a given high-usage OECD-based composite residential basket of fixed telephony services therein between 2007 and 2010. Taking into account the previously mentioned caveats, the evidence indicates a slight downward trend, by some 6% at the EU level, driven exclusively by a significant drop, close to 40% in New Member States while the average price in the EU15 was characterised by a light upward trend.

Graph I.15: price (in €) of high-usage basket of fixed communications, 2007-2010

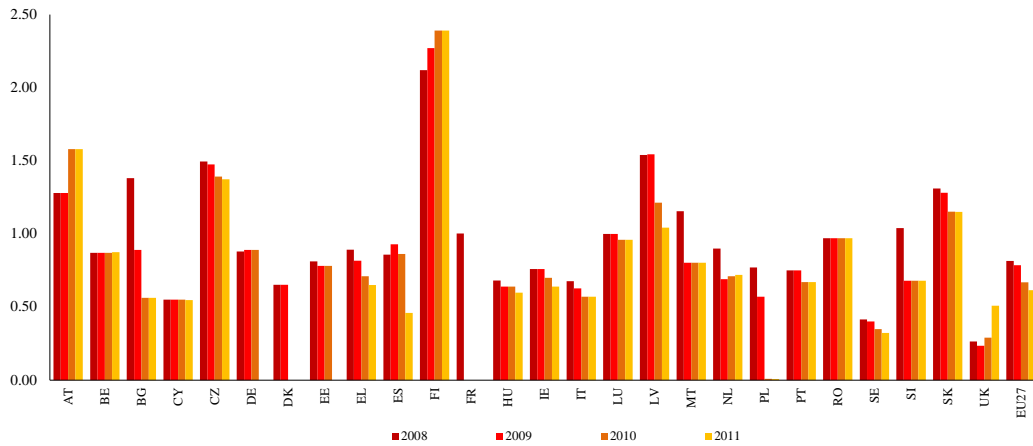


Source: Teligen (2010)

Instead, much more similarly to the mobile segment, the evidence on wholesale prices in Graph I.16 clearly points to improved competitive conditions, as the fixed termination rates⁹² decreased at the average EU level by some 23%, from 0.81 €cents/minute in 2008 to 0.62 in 2011, despite marked differences at the national level.

92 Here we consider only single-transit charges for the sake of simplicity, but similar consideration could be made for local and double-transit ones.

Graph I.16: Interconnection charges (single-transit, €-cents) for terminating calls on the incumbent's fixed network, 2008-2011



Source: European Commission, DAS, (2012)

3.1.3. Competition in the roaming market

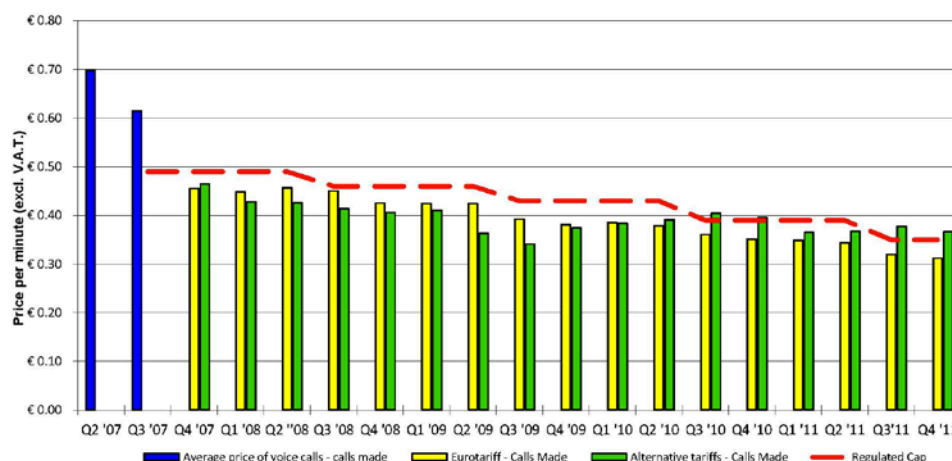
Before turning to the third and last eComms segment, i.e. the broadband market, *roaming prices* deserve separate mention within the competition analysis of this Section. In fact, charges for voice roaming in the EU have been regulated since 2007, the main reason being the excessive pricing resulting from lack of effective competition in the roaming segment⁹³. Instead, as reported by BEREC⁹⁴ and shown in Graph I.17 and Graph I.18 below, current roaming charges indicate satisfactory compliance, at the EU level, with the so-called *Roaming Regulation*. In particular, in all Member States consumers are reported to have access to a Eurotariff for voice calls made and received and a Euro-SMS tariff for sending SMS slightly but consistently below the values stipulated by the Regulation and, in addition, characterised by a downward trend: i) the average Eurotariff for calls made fell from 0.32€/minute in 3Q2011 to 0.313 in 4Q2011, the cap being 0.35€, ii) the Eurotariff for calls received fell from 0.099€/minute in 3Q2011 to 0.097 in the 4Q2011, below the 0.11€ cap; iii) the tariff from SMS was 0.1€/SMS in the last two quarters of 2011, below the 0.11€ cap. The fact that average Eurotariff retail voice roaming rates remained fairly near the regulated caps in most Member States suggests that providers see little attraction in competing on Eurotariff rates even if there is a significant margin between typical wholesale prices and retail caps.

At wholesale level, prices between operators for roaming voice communications were reported in line with the corresponding maximum ceilings established under the Regulation, which is also the case with wholesale charges for the transfer of SMS and other data communications services. For data roaming, in particular, average wholesale and retail charges fell significantly between 2007 and 2011: the former are well below the regulated cap but still higher than the (conservative) BEREC cost estimates. On top of this, unregulated “rest of world” retail voice roaming prices, typically much higher than for intra-EU calls, are reported to have on average decreased between 2010 and 2011 for EU-based providers, which runs counter to the hypothesis that EU operators raised unregulated roaming tariffs to make up for lost revenue due to the regulated price caps.

⁹³ Anyhow, in retail, customers can choose any provider in the country of origin and, as for wholesale, operators can have an agreement with any/all operator(s) in the roaming country. Thus, excessive pricing was rather due to the scant role played by roaming tariffs in the selection of operators on part of customers.

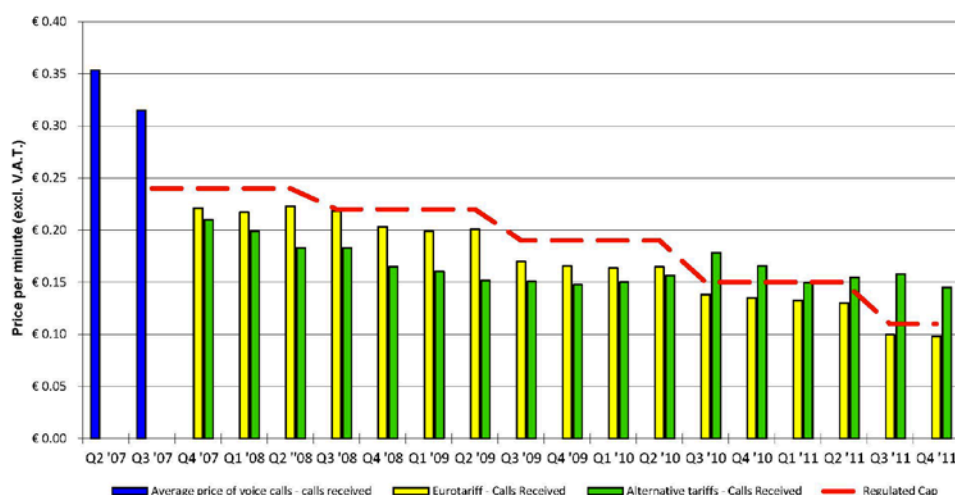
⁹⁴ See BEREC (2011).

Graph I.17: average retail price (in €, excl VAT) per minute of intra-EU roaming voice calls made, 2007-2011



Source: BEREC (2011)

Graph I.18: average retail price (in €, excl VAT) per minute of intra-EU roaming voice calls received, 2007-2011



Source: BEREC (2011)

Overall, the evidence tends to point to the success of the EU-wide regulatory intervention on the roaming segment in reducing prices. The only exception is that the average EU price paid per minute of voice calls made under alternative tariffs was not, as one would expect, below the Eurotariff, and their gap is widening, especially for incoming calls. This is a matter of concern being investigated by BEREC, even if a substantial minority of customers (26.8% of calls made, 29.1% of calls received, and 14.42% of SMS in 2Q2011) use alternative tariffs, in particular because customers paying more for a particular call or SMS do not seem to gain on other services so as to, at least, break even. A possible explanation⁹⁵, hinted also by the higher levels and more marked cross-country dispersion of alternative tariffs computed in Section 3.2.2, could be that these tariffs could be playing a role in reintroducing hidden surcharges ruled out by the Roaming Regulation, for instance through excessively large roaming bundles with respect to the average customer's need or larger billing units (per minute, rather than per second). Clearly, this is just a hypotheses, as in theory regulated euro tariff rates are available to everyone, and one should expect rational customers with special needs, like high-usage, to be benefitted by the possibility, allowed by the Regulation, to find a better deal through a smart choice of existing alternative tariffs.

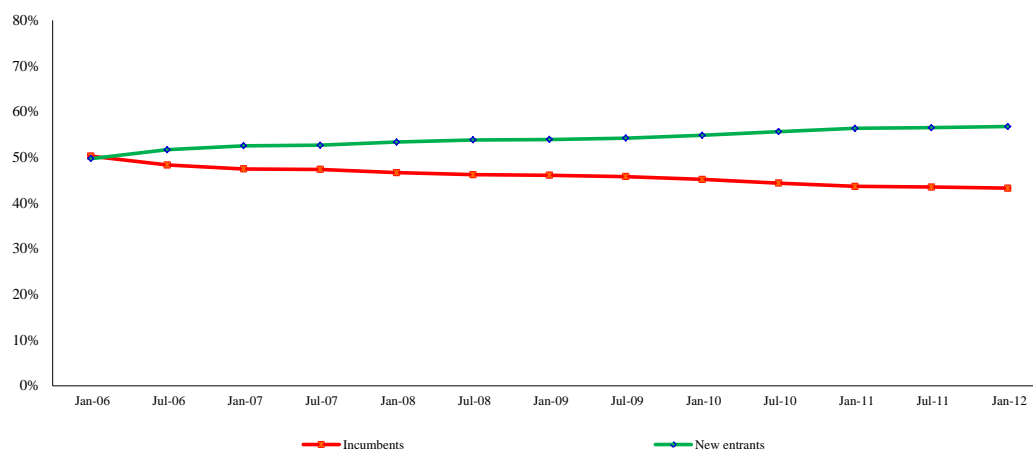
3.1.4. Competition in the broadband market

The last eComms segment to be analysed in term of competition is the broadband market. As for **fixed broadband**, in particular, Graph I.19 shows that the shares of the incumbent fixed operators have continued to follow a steady downward path since 2006 to the benefit of new entrants. Again, the slight downward trend in

⁹⁵ See, for instance, BEREC (2011)

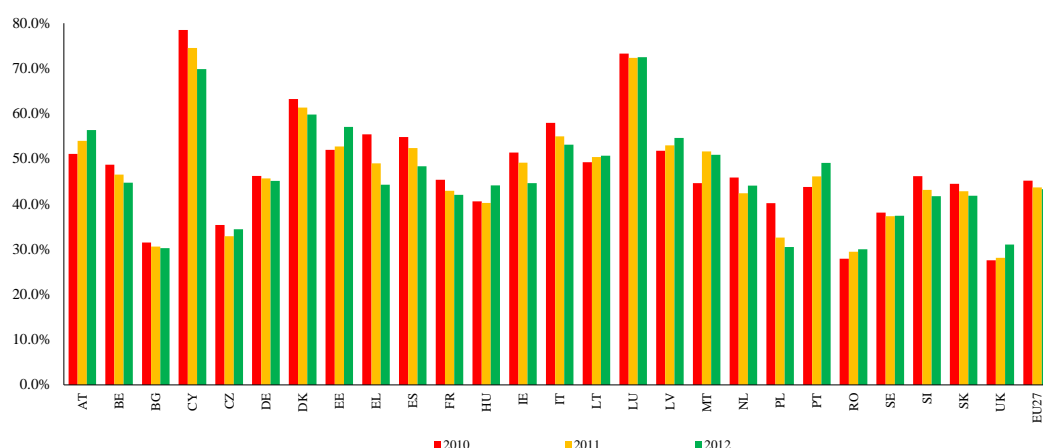
the incumbents' market shares at the EU level (by some 7 pp) reflects quite different evolutions in the various national markets, as shown in Graph I.20. Namely, in 2011, the incumbents' shares ranged from 30-31% (Bulgaria, Poland, Romania, and the United Kingdom) and 70-72% (Cyprus and Luxembourg), with countries like Estonia, Hungary, Lithuania, Latvia, Malta, the Netherlands, Portugal, Sweden, and the United Kingdom even witnessing an upward trend thereof over the last triennium.

Graph I.19: EU average fixed broadband operators' market shares, 2006-2012



Source: European Commission, DAS, (2012)

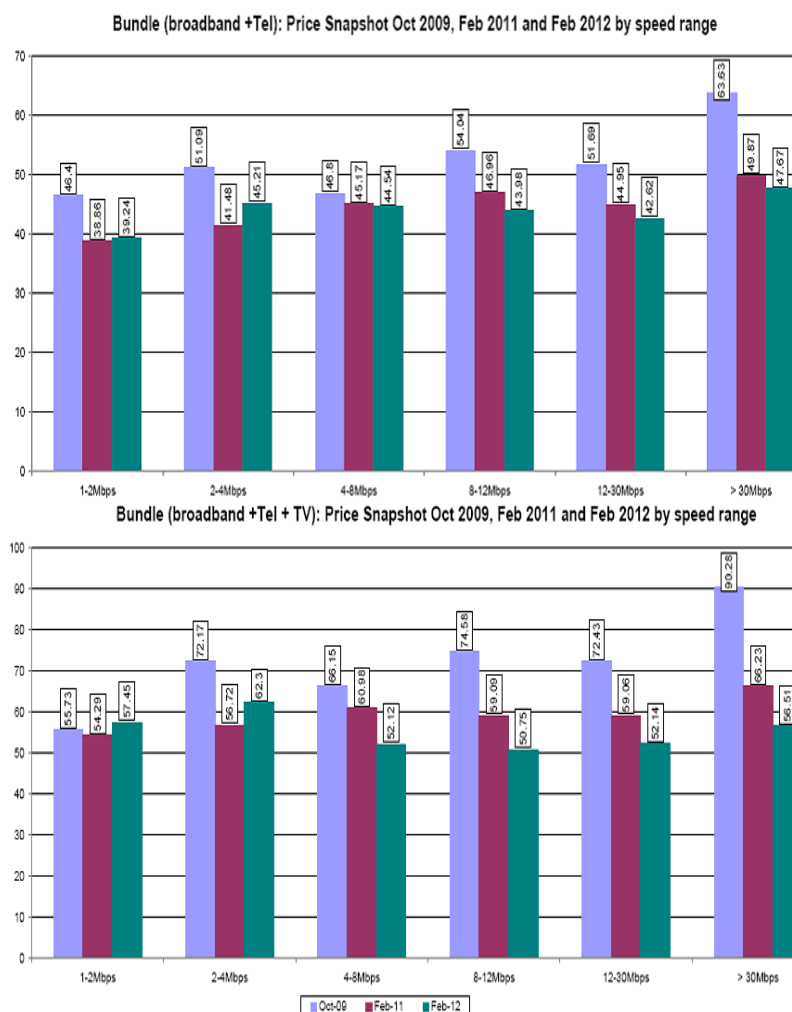
Graph I.20: Fixed broadband lines, national incumbents' market shares, 2010-2012



Source: European Commission, DAS, (2012)

In terms of retail prices, it should be first of all highlighted that, for fixed broadband, the analysis is not straightforward, mainly due to the increasing diffusion of bundled offers and the diversity of possible technical specifications, including speed, therein. In order to solve this problem and allow the identification of an overall EU-level trend in fixed broadband prices, Graph I.21 below reports the median retail prices for different speed brackets (from 1 to more than 30 Mbps) in 2009, 2011, and 2012, taking into account the most widespread bundling solutions, including internet + telephone and internet + telephone + television. Giving a reliable idea of the median evolution of competitive conditions in the fixed broadband segment, a clear pattern of price reduction can be noticed in the EU over the last triennium for bundled offers, mainly in the segment above 4Mbps and for triple-play bundles.

Graph I.21: Snapshots of EU retail prices (in PPPs) for fixed broadband bundles by speed range, 2009-2012



Source: Van Dijk Management Consultants (2011)

Before having regard to wholesale prices, it is worth recalling that, in line with regulatory practices already applied in the US, EU *acquis* requires operators with SMP in the fixed network to unbundle their local telecommunications loop⁹⁶, as a primary means to opening to full competition the local access market, once among the least competitive ones in the EU⁹⁷. In particular, since it would be economically unfeasible for new entrants to duplicate the local access infrastructure in a reasonable time and alternative platforms like cable may not offer the same functionality/ubiquity, the 2002 Second Telecoms Package included the NRAs' possibility to provide new market players with the possibility of unbundled access to the fixed incumbents' local loop. In fact, provision of network access is one of the remedies to address a situation of SMP pursuant to the *Access Directive*⁹⁸.

Mandatory unbundling of the copper local access network (hereafter LLU) can take different forms, including full LLU, line sharing and bit-stream access: the former options are the most widespread in the EU⁹⁹. When NRAs establish cost-oriented price caps, the preferred method of assessing costs is a *bottom-up long-run incremental cost*, regarded as allowing efficient recovery of costs, assuming that all assets are replaced in the long run and that all costs become variable.

⁹⁶ The local loop is traditionally the physical copper line circuit (twisted metallic pairs of copper wires, one pair per ordinary telephone line) in the local access network connecting the customer's premises to the operator's local switch, concentrator, or equivalent facility. Nowadays, however, fibre optic cables are being increasingly deployed to connect various customers, in competition with other technologies such as wireless/satellite.

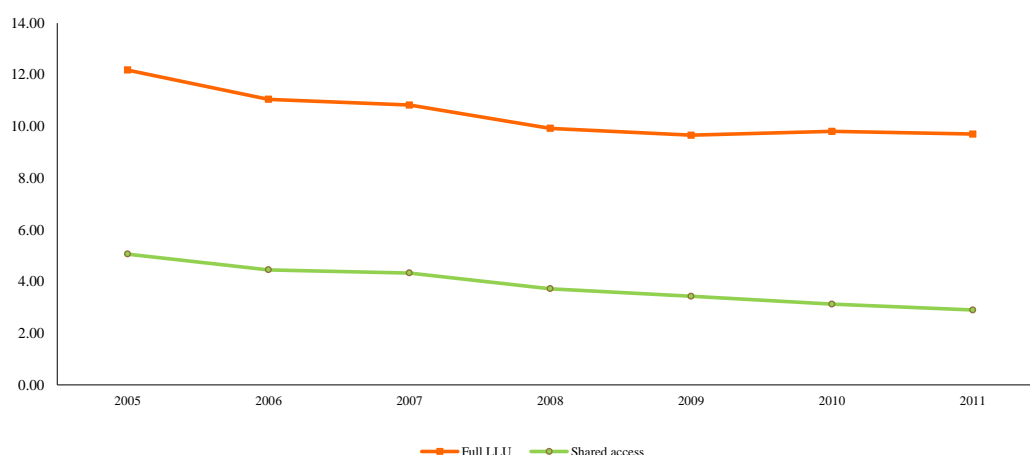
⁹⁷ In fact, new entrants lacked alternative network infrastructure and were not able with traditional technologies to match the economies of scale and the scope of fixed operators having SMP, rolling out their networks protected by exclusive rights, and funding their investments through existing monopoly rents. For a detailed account refer, for instance, to Spiliopoulou (2012).

⁹⁸ The Access Directive lists the remedies that NRAs can impose on operators found to have SMP to ensure access to communications networks and essential facilities: these include transparency (Art 9), non-discrimination (Art 10), accounting separation (Art 11), access requirements (Art 12) and price controls (Art 13); besides, should these measures fail to achieve effective competition, the NRAs may, as an exceptional measure, impose functional separation on a vertically-integrated operator (Art 13a). Namely, Article 12 lists ten forms of access obligations, including to specified network elements, resale products, and technical interfaces.

⁹⁹ See European Commission (2012). In particular, where "full unbundling" is mandated, the access seekers must be offered full access to the local loop, and may provide services over the loop without their retail customers having to take a voice service from the incumbent. Instead, shared access allows access seekers to deliver broadband services over the local loop by sharing it with the incumbent, who may continue to offer basic voice services to the final customer.

With this background in mind, it is worth noticing from Graph I.22 that, at the average EU level, monthly wholesale charges for both full LLU and shared unbundling have significantly decreased between 2005 and 2011, respectively by 20.4% and 42.7%.

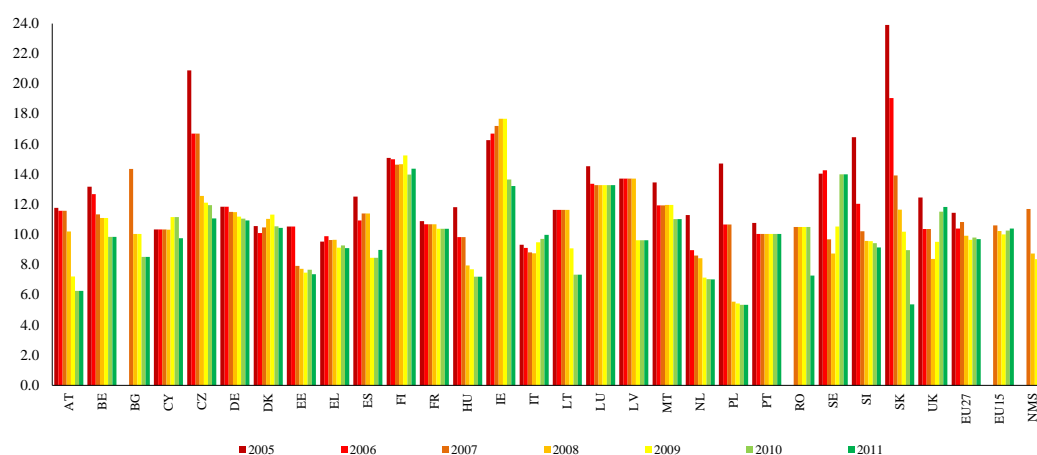
Graph I.22: EU average monthly average total cost (in €) for full LLU and shared access, 2005-2011



Source: European Commission (2010)

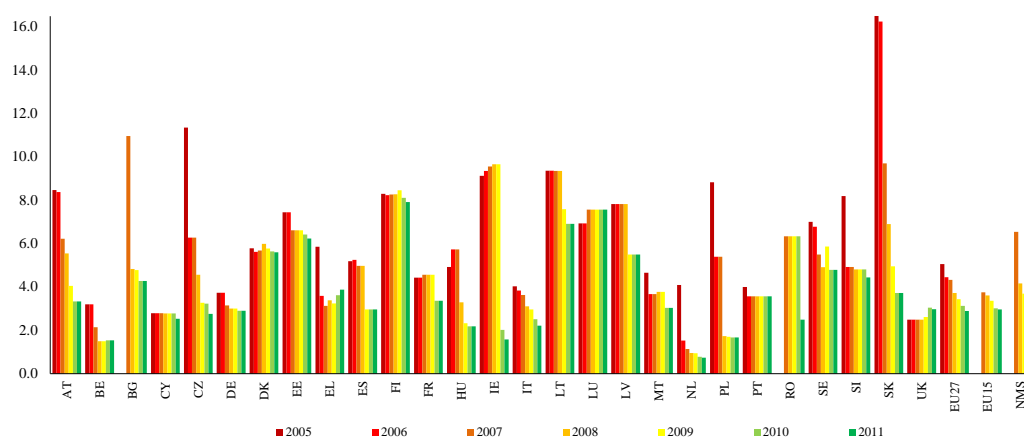
Although the EU-level trend seems fully in line with the rationale underlying the liberalisation of EU e-communications via LLU, i.e. increasing competition and, thereby, providing a broader portfolio of service offerings at more attractive tariffs, Graph I.23 and Graph I.24 indicate that marked differences still exist among Member States. As of October 2011, wholesale charges for full LLU are the lowest (below 6€) in Poland and Slovakia and the highest (above 12€) in Finland, Ireland, Luxembourg, and Sweden.

Graph I.23: Full LLU, monthly total cost (in €), Member States' level, 2005-2011



Source: European Commission, DAS, (2012)

Graph I.24: Shared access, monthly total cost (in €), Member States' level, 2005-2011



Source: European Commission, DAS, (2012)

As for **mobile broadband**, it seems preferable to focus more on the role that this market can play in terms of *inter-platform competition* (see *Box I.1*)¹⁰⁰. In order to provide some background, it is worth recalling that a major engine for the development of the EU mobile broadband segment has been represented by smartphone devices, which, with a 27% share in 2011 compared to 37% in the US¹⁰¹, have pushed the market ahead in value and disrupted the *status quo* by challenging traditional phone manufacturers. Indeed, while its initial growth was mainly due to early adopters at the higher end, the smartphone market is now set to grow rapidly irrespective of poor economic conditions and narrow the penetration gap among Member States. This development is crucially paving the way for operators to boost their data revenues, also in that smartphones allow both reducing churn and encouraging up-selling price plans¹⁰²; it is, in fact, foreseen¹⁰³ an annual increase in mobile data traffic by roughly 100% until 2015, with video remaining the main contributor. To address the subsequent congestion issues, greater attention has thus been devoted to two aspects of mobile broadband, namely: i) technological standards; ii) adequate availability and use of radio spectrum. On the former, commercial 4G standards like LTE and WiMAX were launched in 2010, respectively in Sweden and the US. Nevertheless, while Voice over LTE (VoLTE) is expected to debut in 2012 on the US Verizon Wireless network, 4G is destined to remain an alternative only in the medium run in the EU, where no large-scale roll-out is expected in the short term. As for the latter, instead, a crucial contribution at the EU level, also overcoming previous delays and deficiencies in this respect, is being made by the 2012 *Radio Spectrum Policy Programme* (RSPP, hereafter), which, on top of the expiration of old licenses and the on-going *refarming*¹⁰⁴ exercise, is meant to free significant spectrum resources for eComms services in many Member States and make a major contribution to the roll-out of mobile broadband networks and thus to the DAE targets. In particular, several National Spectrum Strategies have been subsequently adapted to take into account the opening of the 800MHz band to wireless broadband by January 2013, and the refarming of frequencies once reserved to GSM: Graph I.25 provides a quantification of the assigned spectrum by harmonised bands.

¹⁰⁰ See Section 2.1. An analysis of pricing conditions attached to auctions for radio spectrum licences allocation is beyond the immediate purpose of this paper. However, follow-up work thereon may be in the pipeline.

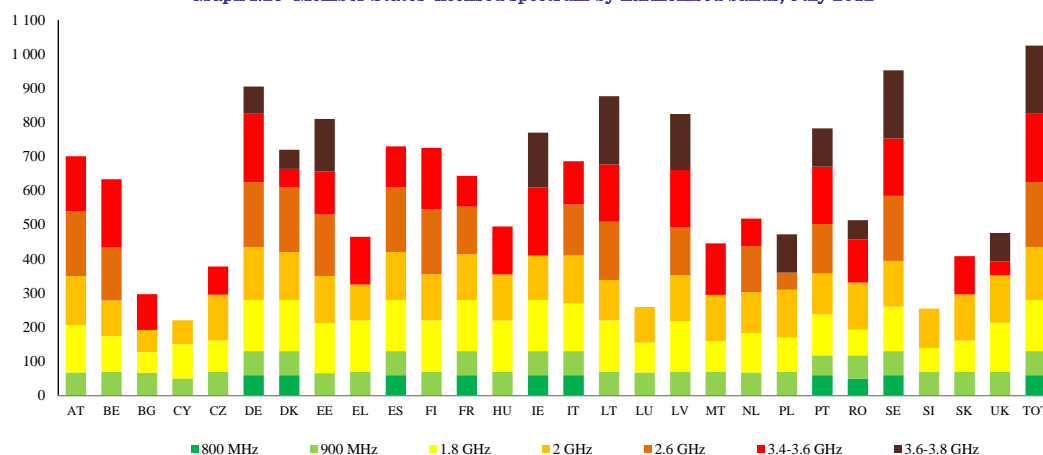
¹⁰¹ See OECD (2011)

¹⁰² For instance, in light of the growing range of available connected devices such as tablets, e-Readers, and gaming consoles, where tethering (connecting two or more devices together) is usually prohibited in flat-rate data plans, creating a new option for consumers that enables this usage could raise revenues per user.

¹⁰³ See EITO (2011) and OECD (2011)

¹⁰⁴ The *refarming* is the process of changing the allowed specific rights of use of frequencies, following the modification of National Frequency Plans in line with the amended GSM Directive. Namely, the exercise aims at increasing available spectrum in the VHF and UHF private land mobile band by enacting a maximum 12.5 KHz bandwidth for all applications (by 2011) and make relative licences fully operational on such equipment (by 2013) across private land mobile bands between 150-174 and 421-512 MHz. This will increase available channels and create new ones between those already existent: in the OECD EU countries, these rose from 816 in 2004 to 2529 in 2009. As an outcome of increased channel availability is audience fragmentation, broadcasters are faced with the challenge to rechart their business models, and intensify inter and intra-platform competition for revenues.

Graph I.25: Member States' licensed spectrum by harmonised bands, July 2012



Source: Commission Services

In particular, multiband assignments, making frequencies below and above 1GHz available at the same time in light also of future 4G developments, have been completed or envisaged in Austria, Cyprus, Czech Republic, Germany, Denmark, Spain, Finland, France, Ireland, Italy, the Netherlands, Portugal, Romania, and the United Kingdom, with international agreements signed to reduce the risk of interferences therein. Licensing of the most sensitive "digital dividend" band¹⁰⁵ has been completed by eight Member States, namely Denmark, Germany, Spain, France, Italy, Portugal, Romania, and Sweden, although Spain and Romania cannot actually release spectrum until 2014; four others are under way and should finish by end-2012, while derogations may be requested by the others, e.g. due to difficulties in the digital switch-off.

Overall, the recent approval of the RSPP indicates the emphasis laid by the EU regulator on an integrated approach that could be a unique opportunity to boost mobile broadband, foster platform competition in the broadband segment, and enhance access to eComms services. Yet, discrepancies among Member States in implementing it suggest the importance of stepping up efforts to release spectrum, starting from the "digital dividend" that allows broad territorial coverage and good reception inside buildings.

3.1.5. Conclusion

Overall, the analysis of competition of the eComms industry in the EU provided in this Section seems to indicate rather clearly that the liberalisation process characterising this industry over the last decades has indeed been a success in certain terms, especially compared with other network industries like rail transport. Namely, despite significant discrepancies among Member States and specific *caveats* related to the eComms segment under scrutiny, the indicators employed in this Section¹⁰⁶ point to improved competitive conditions in e-communications in terms of price performance, market structure, and operators' conduct. The analysis of specific segments, like roaming, mobile termination rates, and mobile broadband, reveals that a crucial role in this market opening process has been played also by the regulator both at the EU level, with crucial integrated approaches, and at the national one. Overall, the global improvement of competitive conditions across different eComms segments in the EU contrasts with persistent differences among Member States in terms of prices, market power, consumer's choice, and implementation of the regulatory framework.

3.2. INTEGRATION ANALYSIS: ASSESSING PROGRESS TOWARDS A SINGLE MARKET FOR ECOMMS

The objective of this Section is to provide a more quantitative and precise assessment of the extent to which this indubitable progress of European eComms in terms of competition, convergence, interoperability, and integrated regulation has contributed to the achievement of a *Single Market for e-communications*, one of the core

¹⁰⁵ The "digital dividend" is the 800MHz band that should be freed by the so-called "digital switch-off" (the switch-off of digital terrestrial broadcasting) and allocated to mobile broadband by end-2012.

¹⁰⁶ Further competition-related indicators could actually be employed: nevertheless, for many of them like the HHI index, the relevant Commission Service has discontinued their collection, and they do not appear in European Commission (2012)

objectives¹⁰⁷ of the EU2020 strategy. In fact, an accessible, affordable, and secure eComms infrastructure can crucially contribute to competitiveness, jobs, and growth.

The rationale underpinning this integration analysis is twofold: i) on the one hand, past studies¹⁰⁸ argued, on the basis of computed dispersion measures in price and non-price indicators referred to the European eComms market as it stood in 2009, that significant fragmentation still persist; ii) on the other hand, crucial regulatory developments have taken place since 2009 in eComms and beyond allow tracing a more integrated EU-wide approach in both hard and soft regulatory measures thereon: e.g., the 2009 *Roaming Regulation* (extended in 2012), the 2009 *Recommendation on mobile termination rates* (MTRs), the 2010 NGA Recommendation, and the 2012 *Radio Spectrum Policy Programme* (RSPP). These developments support the need to update our understanding not only of competition but also of integration in eComms, based on the latest available evidence, given the importance that this may have shaping the work of the EU and national regulators thereon.

3.2.1. The chosen dispersion measures

In order to assess the Member States' progress towards a full-fledged internal market for eComms fifteen years after the 1998 First Telecoms Package, measures of price and non-price disparities among them are employed as indicators of integration in this Section, mostly based on the latest evidence on price and non-price performance and market structure in the eComms industry. In fact, although it is clearly an empirical matter how much scope for disparities among Member States should remain in a genuine Single Market, given the existence of country-specific features like GDP/capita, rapid technological development, and the somehow geographically local nature of eComms¹⁰⁹, there is little doubt that a well-functioning and truly integrated internal market for eComms would keep them in check over time, e.g. through arbitrage and rational corporate strategies. In other words, in an ideally integrated eComms market one would expect price and non-price disparities to be sufficiently contained to reflect only local features and not engender any further opportunity to act for market players, not least due to divergent regulatory implementation or enforcement¹¹⁰.

Throughout this Section, three measures of dispersion are considered in terms of price performance:

- i) The **price disparity** is defined as the ratio of the difference between the largest and the smallest country-specific price to the smallest one, once the extreme values have been removed; the advantage of this measure is that one can take a cut-off of 100% to identify "worrying" cases of fragmentation among Member States based on an intuitive reading thereof: larger values indicate that the second highest country-specific price in the EU is more than twice the second smallest, reasonably hinting at persistent differences among Member States.
- ii) The **coefficient of variation** is computed as the ratio of the standard deviation of the distribution of prices across Member States to their average, both in absolute terms and corrected by the price level index¹¹¹; while with these measures it is harder to define an intuitive cut-off, the advantage is to account for the price distribution and, in the latter case, also for the Member States' relative price levels.

Graphs I.26a, I.26b, I.26c below reports, for different national eComms markets, the evolution over time of the price disparity and of the coefficient of variation of price performance indicators across Member States, both in absolute terms and corrected by the PLI. A general overview of this litmus test of integration among national eComms markets in the EU is not particularly encouraging. For instance, by just looking at the price disparity

107 See CWP-2013: Network industries incl. Digital agenda

108 See, e.g., Pelkmans and Renda (2011).

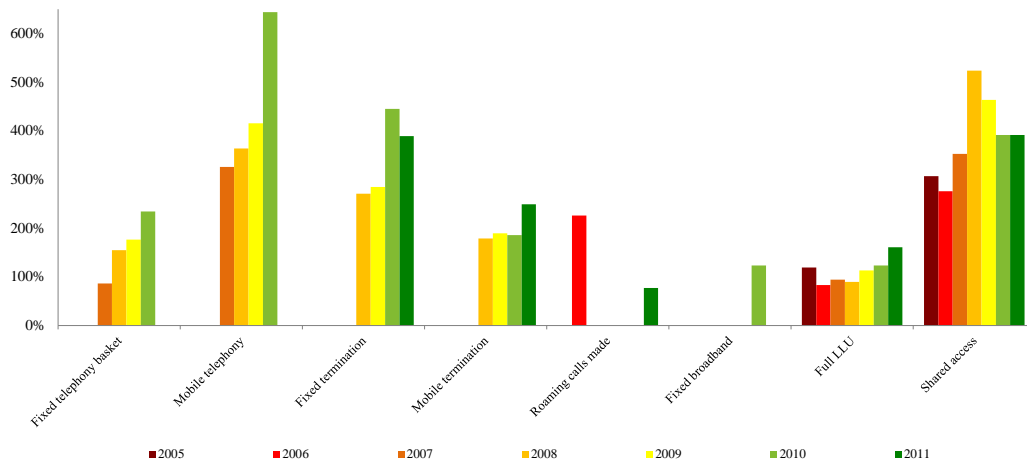
109 On this, some studies like Trillas (2010) argue that the potentially competitive nature of all telecommunications markets and the need for flexibility due to rapidly changing technology make harmonization less necessary in this industry than, e.g., in electricity, as policy interventions refers to a good or market that is geographically local in nature, with few or non-significant spillovers (local access).

110 It must be remarked that studies like Bacchiocchi *et al.* (2011) and Wolszczak-Derlacz (2008), provide some evidence, the former based on an empirical analysis of fixed telephony prices, that technology and national factors (e.g., demand, GDP, wages, different taxation, and historical presence of competing infrastructure) may have more explanatory power on price levels than any regulatory variable (including entrants' market shares). Besides, according to Dreger *et al.* (2007), the main drivers of price convergence that seem crucial to explain price developments are a higher level of competition exerting downward pressure thereon and the catching-up process of low-income countries, which leads to a rise in price levels and higher inflation over a transition period: this may be relevant also in eComms. Nevertheless, this does not impair the hereby presented analysis of integration, as it does not focus on merely static price disparity, which the mentioned reasons may make insufficient to analyse the evolution towards an integrated eComms market, yet explores price co-movements. In other words, this annex tries to gain perspective into the state of play in terms of fragmentation, by evaluating also the potential tendency toward a reduction in price disparities over time, with particular emphasis on increasingly important broadband and mobile services rather than traditional PSTN/ISDN voice services.

111 The price level index (PLI), obtained dividing purchasing power parities by the current nominal exchange rate, expresses each Member State's price level relative to the EU27, by indicating how many € a given quantity of goods/services costs therein with respect to the average price in the EU27.

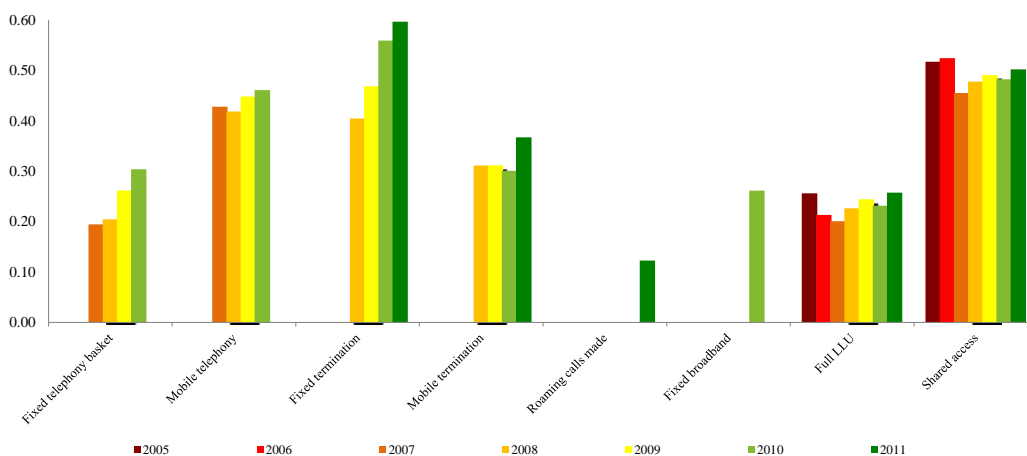
measured on the basis of 8 different retail and wholesale price performance indicators¹¹² referred to different eComms segments, in no single case this amounts to less than 100% over the triennium 2009-2011, with the only notable exception of regulated roaming charges for intra-EU calls made¹¹³. In this case, however, the positive decrease in price disparity from above 200% in 2005 to a range of 56-70% in 2011 may well reflect the EU-wide intervention undertaken by means of the 2007 (amended in 2009) Roaming Regulation. Instead, the dispersion in different segments, including (softly) regulated ones like MTRs, where it amounts to more than 150% and is markedly increasing over time, appears in contrast with the internal market objective both in terms of level and of a generally upward trend: e.g., the lowest fragmentation can be noticed in full LLU wholesale charges, whose price disparity remained slightly below the (loose) cut-off of 100% between 2006 and 2008, yet witnessed marked growth up to the 2011 level of 161% thereafter.

Graph I.26a: Price disparities in various eComms segments



Source: calculated from European Commission (2012), Teligen (2010), Van Dijk Consultants (2011)

Graph I.26b: Coefficients of variation (absolute prices) in various eComms segments

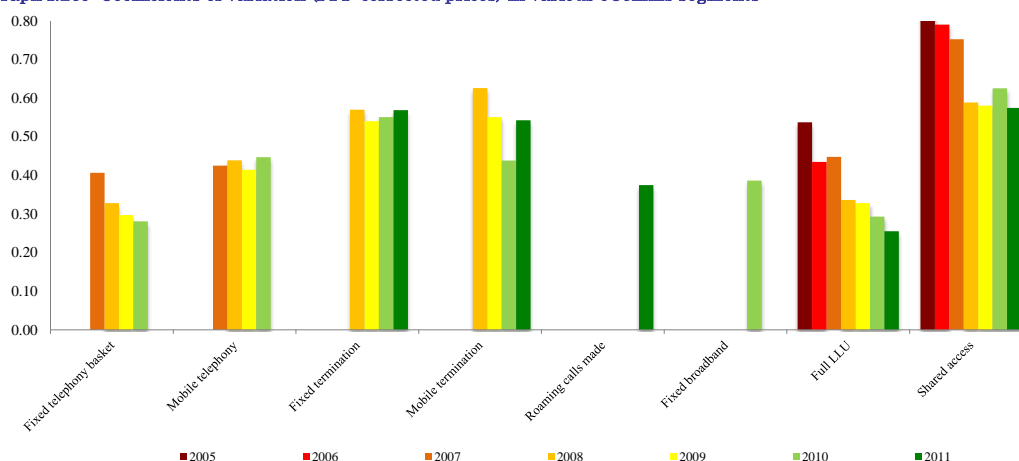


Source: calculated from European Commission (2012), Teligen (2010), Van Dijk Consultants (2011)

112 Namely, these indicators are: 1) the price of a high-usage basket of fixed telephony services; 2) the average price (revenue in 2010) per minute of mobile voice communication; 3) fixed and mobile termination rates; 4) roaming charges for intra-EU calls made; 5) median retail price of broadband (as defined below, i.e. the median national price across all types of offers and all speed baskets between 2009 and 2012, coupled with the best possible offer); 6) the monthly wholesale charges for full LLU and shared access.

113 Note that, for roaming, the 2005 price disparity is drawn from Pelkmans and Renda (2011), and the 2011 one is computed as follows: based on the charts reported in BEREC (2011) the best national deal between the Eurotariff and the average alternative offer is taken for each Member State in each quarter of 2011. The dispersion is thus computed in the mentioned way (i.e. as the highest/lowest ratio after removing the extremes) as a range across the four quarters, and is anyhow a *lower bound* based on the assumption that users are rational and can always choose the best available offer. The prices are taken for calls made (whose roaming charges are higher), but the dispersion measures would be even higher for calls received (e.g. price disparity close to 200% in 2011).

Graph I.26c: Coefficients of variation (PPP-corrected prices) in various eComms segments



Source: calculated from European Commission (2012), Teligen (2010), Van Dijk Consultants (2011)

Let us now consider the single eComms markets in more detail and see whether the second dispersion measure hereby computed, i.e. the coefficient of variation, and the correction by the country-specific price level index, confirms the mentioned conclusion.

3.2.2. Price and non-price integration in mobile and fixed telephony

As for mobile telephony, both wholesale and retail prices, namely absolute MTRs and APPM, are characterised by a coefficient of variation consistently above, respectively, 30% and 40%, and increasing at least over the triennium 2008-2010. Although on the retail side of mobile communications there are significant differences among the levels of use made by national customers and the operators thus tend to tailor their packages to meet these local demands¹¹⁴, the high and enduring dispersion in retail prices seems to depict an even more evident picture of fragmentation. In fact, this remains gloomy even when the price performance is corrected by the country-specific PLI: in this case, not only the absolute dispersion among national MTRs increases, but its downward trend from 63% in 2008 to 44% in 2010, is followed again by an increase up to 50% in 2011.

This is relevant in the case of MTRs, whose considerable dispersion across Member States before 2009 (the 2008 price disparity is close to 200% and more than 700% without removing extremes), was one of the reasons leading the Commission to intervene with a Recommendation thereon¹¹⁵, based on the evidence that these variations could not be justified by differences in underlying costs, networks or national characteristics, but were an indirect subsidy to mobile operators with large market shares to the detriment of smaller and fixed-line operators. In fact, since price divergences and differing regulatory approaches could undermine operators' competitiveness in the Single Market and divert funds away from critical investments like upgrades to high-speed internet networks and from innovative services like converged fixed-mobile products and competitively-priced bundles, one of the stated objectives of the recommendation was to reduce its range to 1.5 to 3 € cent/minute.

Instead, the above evidence suggests that, while the objective to reduce absolute MTRs in the EU has been achieved (see Section 3.1.1), their dispersion, ranging from 1.81 (Cyprus) to 9.15 (Luxembourg) €cent/minute as of October 2011 (price disparity of 250%), has remained rather unchanged. These issues are anyhow related, reflecting different adjustment speeds in the Member States: this would signal also that, when considering the impact of wholesale price control on unregulated retail prices, there are structural national factors within the internal market and market dynamics upon which regulatory intervention may have a relatively limited impact.

As for fixed telephony, the wholesale and retail prices chosen to analyse the EU-wide progress in terms of integration are, respectively, the fixed termination rates and the price of a high-usage basket of fixed voice services, both residential and for SMEs (the same used in Section 3.1.2). In terms of fixed termination rates, analogous considerations apply to the MTRs analysed in the previous Section, despite their relatively more contained average magnitude and regulatory relevance. In particular, the disparity measured by the coefficient

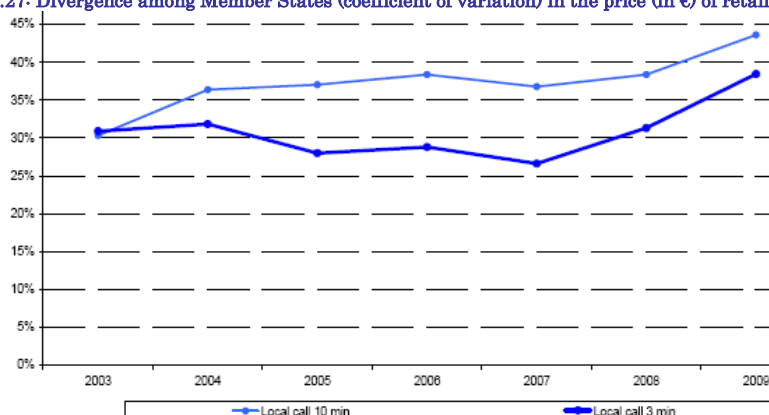
¹¹⁴ Here this is not relevant as the APPM is considered, but one could expect that, since Member States with higher usage tend to perform better in mobile baskets with a greater number of calls, the dispersion could be different depending both on which basket is chosen to measure it, and on the inclusion of subsidiaries and MVNOs' offers (important when large operators in these countries focus their efforts on larger segments).

¹¹⁵ The other reason was their high level, since high MTRs make it harder for fixed operators and small mobile ones to compete with the larger. See Section 3.1.1 for the sources.

of variation is large (above 40%) and markedly increasing over 2008-2011. Although this upward trend become less evident in PPP-corrected terms, the absolute dispersion remains consistently above 50% throughout the whole period, hinting again at the need to step up efforts in terms of integration.

The coefficient of variation of the retail prices for a residential basket of fixed telephony is more contained than in other segments, yet it increased from some 20% in 2008 to some 30% in 2010, corresponding to a price disparity over 200%. These results are in line with those reported in previous studies for stand-alone retail prices of local calls (3 and 10 minutes): Graph I.27 shows a rather steadily increasing coefficient of variation, especially after 2007, and always above 30% for longer calls.

Graph I.27: Divergence among Member States (coefficient of variation) in the price (in €) of retail local calls



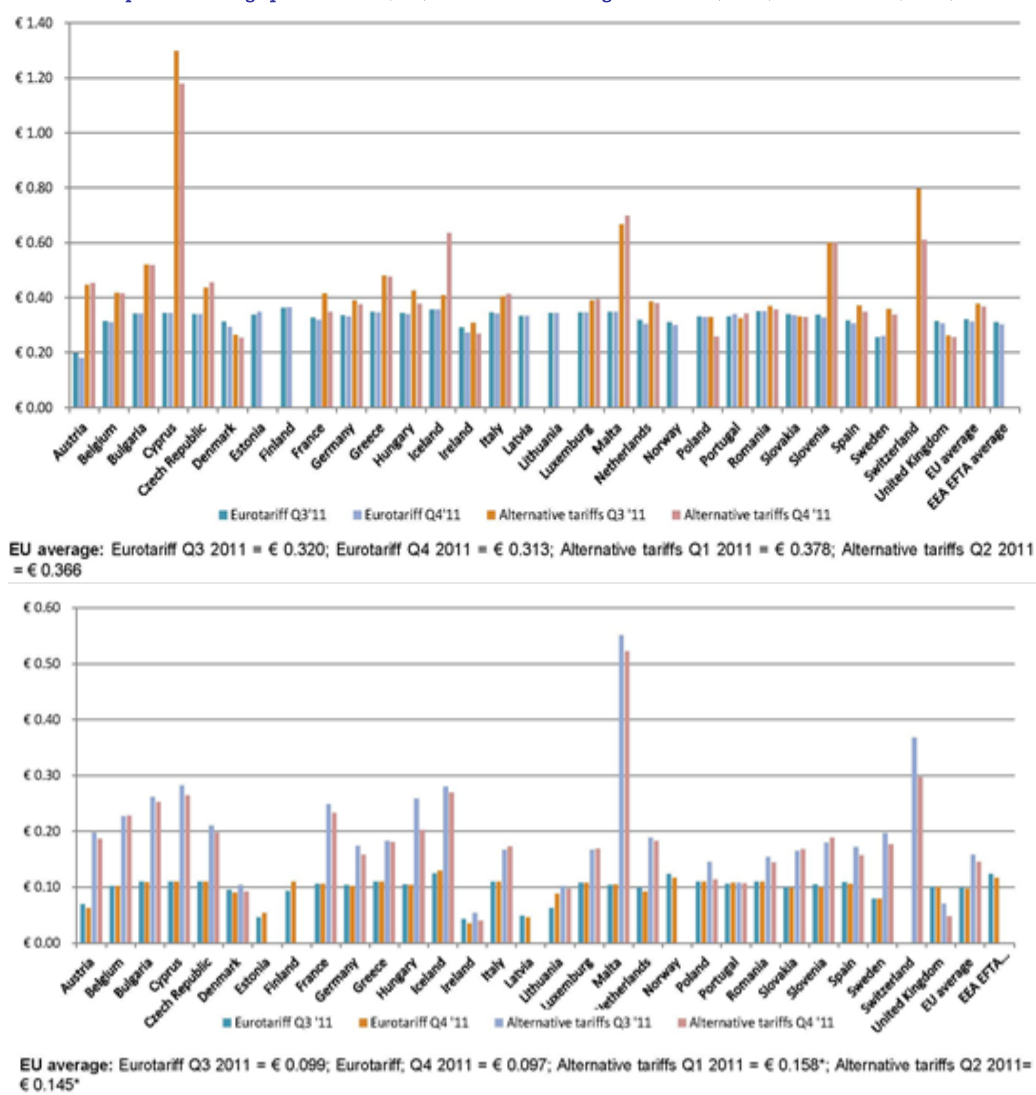
Source: European Commission (2010)

Interestingly enough, the evidence of fragmentation would be even more pronounced if a business basket like the SMEs basket by the OECD was considered. This matters because differences in business costs may well be considered a factor of locational (dis-)advantages that one would expect to come under pressure in a well-functioning internal market: instead, the 2010 price disparity thereof amounted to some 300%.

The two last issues worth analysing in terms of integration in price and non-price performance as far as telephony services are concerned are, respectively, roaming charges, whose latest figures are reported in Graph I.28 below, and number portability.

On the former aspect, the 226% price disparity reported in Graph I.26a indicates that in 2005, before the first Roaming Regulation, roaming charges were not only high but also much dispersed among Member States. As already mentioned, the evidence seems to indicate that this EU-wide regulatory intervention has engendered not only improved competitive conditions in the form of steady price reduction but also price convergence in the internal market. In fact, the hereby employed integration indicators considerably improve thereafter. In particular, across the 4 quarters of 2011, the disparity ratio amounts to 56-70% and the coefficient of variation to 13.1-16%, both the lowest across all the considered eComms segments. Yet, as mentioned, these values should be considered as lower bounds subject to ideal conditions that the evidence (see Section 3.2.1) shows to be rarely satisfied in practice. In fact, if one considers the level of alternative tariffs separately, the picture changes quite radically. While the dispersion in Eurotariff for intra-EU voice calls made remained, as expected, more contained and rather constant throughout 2011 (with a coefficient of variation slightly increasing from 11.8 to 13.9% and price disparity of 50-64%), that in alternative tariffs is much less encouraging: namely, the price disparities ranged from 161 to 180% and the coefficient of variation from 41 to 52%, much above many (also unregulated) segments.

Graph I.28: average price/minute (in €) of intra-EU roaming calls made (above) and received (below)



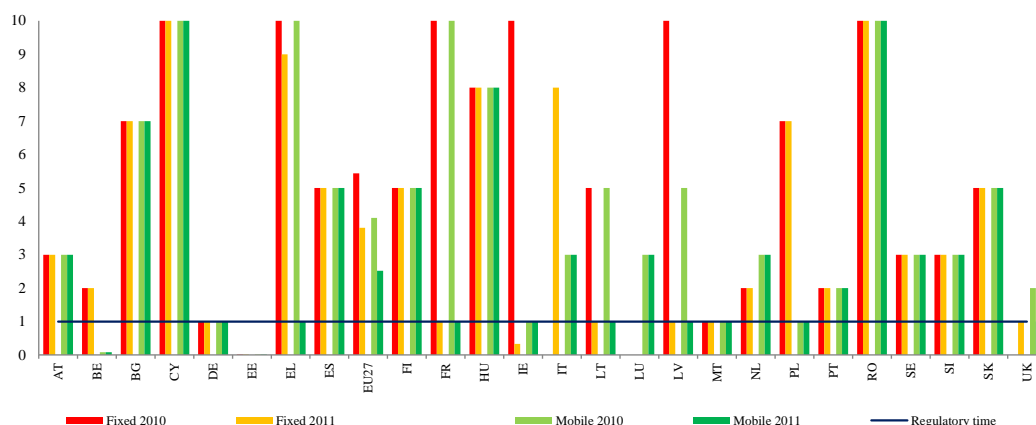
Source: BEREC (2011)

As for the latter aspect, i.e. number portability, evidence from end-2010 on the implementation of the EU-wide integrated approach thereto also indicates persistent differences across Member States, which do not appear to be fully explained by the "national provisions on contracts, technical feasibility and the need to maintain continuity of service" that NRAs should take into account when regulating the porting process.

For instance, regulatory approaches on the *downtime* are rather divergent: only 12 CEPT countries have explicit maximum downtime within the portability process in their regulations, while most of the others just refer to a time "as short as possible"; even where a regulation exists, then, maxima are very dispersed around the CEPT average of 2.5 hours, ranging from 10 minutes in Belgium and Finland to 7 hours in Bulgaria for mobile (disparity ratio: 700%) and from 30 minutes in Sweden to 8 hours in Bulgaria for fixed (disparity ratio: 500%).

On top of this, the latest evidence on porting days (according to the regulatory definition) for mobile and fixed numbers, reported in Graph I.29, indicates that most Member States are, especially for fixed services, still quite far from the ideal "one working day" required by the EU law: the only exceptions are Germany, Estonia, France, Ireland, Lithuania, Latvia, Malta, and the United Kingdom, plus Belgium and Poland for mobile portability. To have a quantitative point of reference, the disparity ratio amounts to 700% for mobile and to more than 2600% for fixed.

Graph I.29: Days for fixed and mobile number portability (regulatory definition)



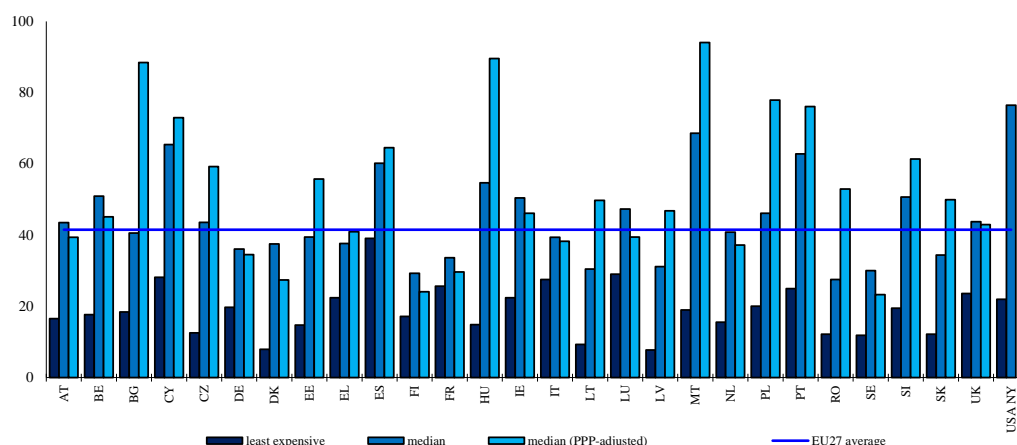
Source: European Commission (2011)

3.2.3. Price and non-price integration in the broadband market

As for the broadband market, the analysis of integration is hereby conducted in terms of both price and non-price performance, given the importance that non-monetary aspects related to investments and penetration of different technologies can play in this increasingly relevant eComms segment.

In order to provide an indication of broadband retail prices at the Member States' level and link them to the proposed integration analysis, median charges are considered across all types of national offers and speed baskets between 2009 and 2012, as reported in Graph I.30 also PLI-corrected together with the best possible offer at the national level. Although the marked heterogeneity across Member States, for instance in terms of diffusion of specific bundles or prevalence of certain speeds, makes it a mere approximation, this approach provides useful insight into the integration of the retail broadband market pricewise. The computed dispersion is quite high if one considers that resorting to the median price has most likely the effect to reduce the variability therein: the price disparity and the coefficient of variation amount, respectively, to 123% and 26% and become much larger, 272% and 38.6%, respectively, when the national average price levels are taken into account.

Graph I.30: Median retail price (all offers over 2009-2011) of fixed broadband



Source: Van Dijk Management Consultants (2011)

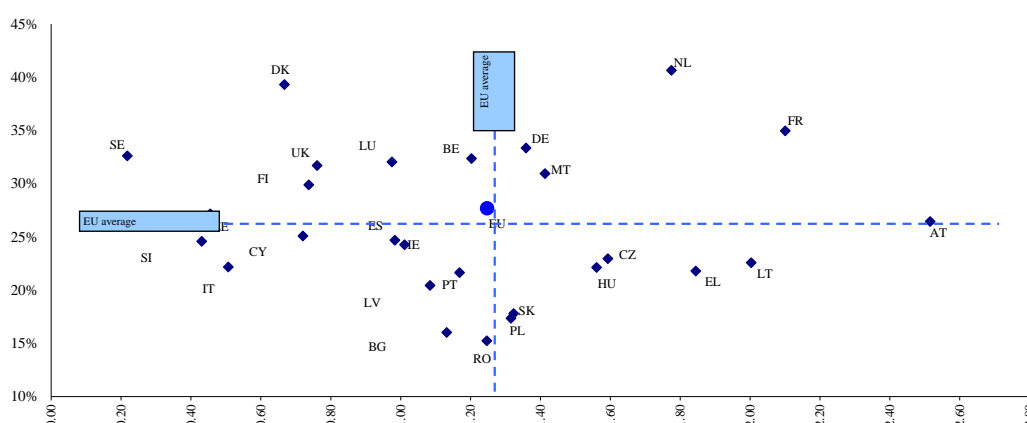
In terms of wholesale price performance, it has already been argued in Section 3.1.4 that competitive conditions have considerably improved over time at the average EU level, particularly for full LLU and shared access, although differences still persist across Member States. Graph I.26a, I.26b, and I.26c allows adding further insight into the latter aspect, showing that price disparity and coefficient of variation are among the lowest, respectively around 100% and 25% for full LLU, and among the highest, respectively above 250% and above 45%, for shared access. In both cases, it is hard to infer a clear downward trend over time from the combination of the two dispersion measures. Nevertheless, a decreasing level becomes much more evident as soon as PLI-corrected wholesale charges are considered for full LLU and shared access: in this case, the coefficient of

variation of shrinks over time, respectively from 54% in 2005 to 25.6% in 2011 and from 83% in 2005 to 57.5% in 2011.

Not only retail and wholesale broadband prices but also further non-price signals of lack of integration seem to denote the need to step up efforts towards achieving a single EU eComms market. In particular, an oft-quoted aspect of fragmentation is represented by the discrepancies in the availability and use of broadband infrastructure across Member States, which is closely linked with a European perspective on how best stimulating new interactive digital platforms. Already in July 2009, the Broadband Performance Index¹¹⁶ capturing six important features of fixed broadband penetration such as rural coverage, price, take-up of advanced services, speeds, mobile broadband, and newer combinations such as fibre plus LAN in some Member States, showed the existence of rather pronounced "broadband divide" in the EU, in particular in terms of dynamic competition. Since this composite indicator is not available for more recent years and its informative content may anyway be hindered by possible correlation among its components, some of them are hereby analysed separately so as to verify the extent of the persistence of the mentioned broadband gap over more recent years.

The EU fixed broadband market has seen a decelerating expansion, with an average penetration rate (subscribed lines per 100 inhabitants) of 27.7% (a total of 139mn fixed lines) in 2011, up by only 1.2 percentage points over the previous year. Graph I.31 shows that significant differences across Member States still exist both in penetration and speed of progress therein: countries like Germany, France, and the Netherlands are characterized by a higher-than-average penetration and speed of progress, while Bulgaria, Cyprus, Estonia, Spain, Ireland, Italy, Latvia, Portugal, Slovenia are lagging behind in both subscribed lines and diachronic improvement therein.

Graph I.31: Fixed broadband penetration (subscribed lines/100 inhabitants) level (y axis, Jan 2012) and 2011-12 p.p. growth (x axis)

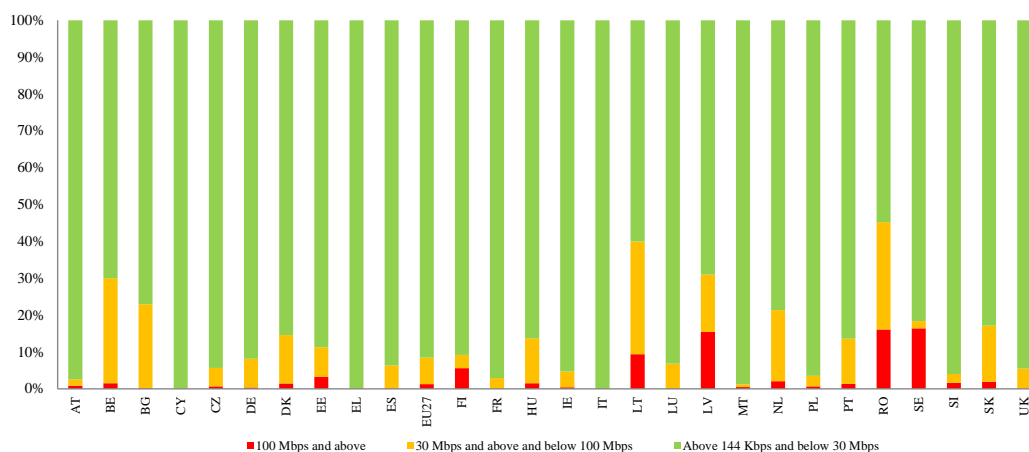


Source: European Commission, DAS, (2012)

These differences in penetration are further compounded by the marked country-specific divergences in terms of speed, with only a few Member States (Belgium, Lithuania, the Netherlands, Romania, Latvia, Sweden, and Denmark) having a penetration of high-speed lines above 5%, as shown in Graph I.32.

¹¹⁶ See *Digital Competitiveness Report 2010* (2010).

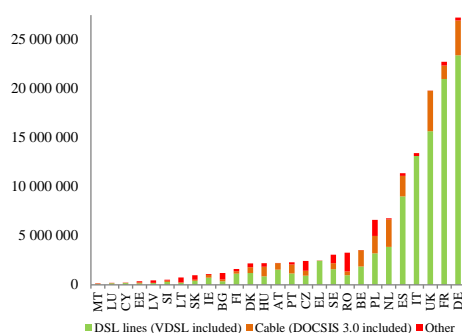
Graph I.32: Speed shares in fixed broadband lines, January 2012



Source: European Commission, DAS, (2012)

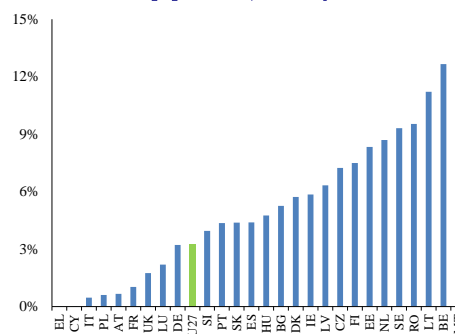
Important discrepancies exist also in terms of the quality of platform competition, as defined in *Box I.2*. Specifically, Graph I.33a and I.33b shows that, although the dominance of DSL is still unshaken in Europe, its penetration decreased from 81% in 2006 to 76% in 2012 in light of the growing popularity of NGA technologies, totalling a 3% average penetration, and in particular FTTH. Nonetheless, fibre in the EU27 appears not only to be trailing behind the USA, but to be characterised by huge differences among Member States: with some countries like Greece, Cyprus, Italy, and Poland being close to a 0% penetration of NGAs, it would be even impossible to compute reasonable disparity ratios and define cut-offs therefor.

Graph I.33a: Share of technology in fixed broadband lines



Source: European Commission, DAS, (2012)

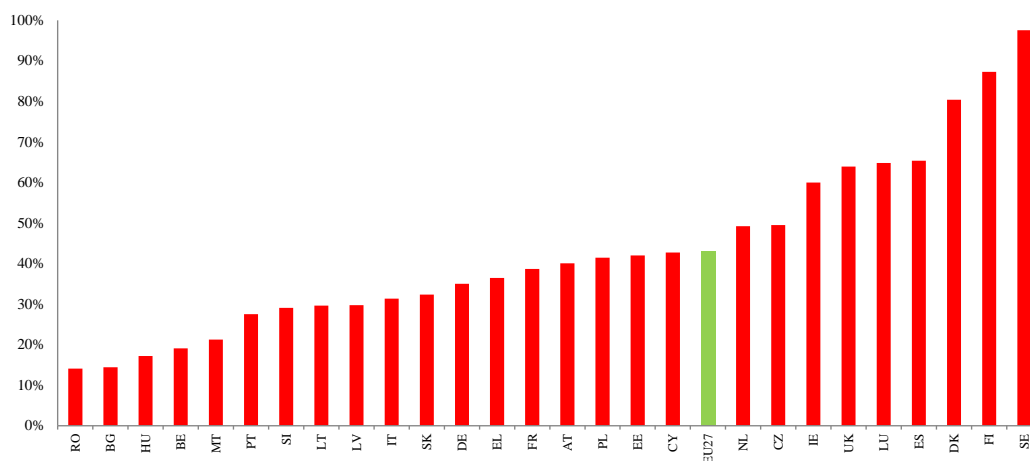
Graph I.33b: Penetration of next generation access networks (as % of the population), January 2012



Source: European Commission, DAS, (2012)

As for the mobile broadband market, its penetration, shown in Graph I.34, was boosted, in contrast with the deceleration in fixed lines, primarily by the wide adoption of smartphones from 26.8% in 2010 to 43% in 2011 at the average EU level. Still, as of January 2012, the coefficient of variation in Member States' penetration rates, amounting to 51.4%, is twice as large as for fixed broadband (25.8%).

Graph I.34: Mobile Broadband Penetration, 2012



Source: European Commission, DAS, (2012)

This should be coupled with the significant differences in the amount of allocated spectrum already hinted at in Section 3.1.4. To provide an intuitive quantitative reference, if one computed the defined disparity ratio for the total amount of licensed spectrum including guard bands, the obtained value would be 256%, and even larger if the discrepancies were to be computed by harmonised bands, in some of which, including the “digital dividend”, many Member States literally have to start. Overall, multiple evidence clearly point to the existence of a significant mobile broadband gap in the EU.

3.2.4. Regulatory issues underlying integration

The quantitative evidence proposed throughout Section 3.2 points to the still significant effort required in order to reach an internal market for eComms in the EU as far as significantly disparate aspects of the eComms industry are concerned. The relative lack of cross-border and pan-European operators may be considered another piece of evidence hinting at the lack of a truly integrated single market. Already some years ago¹¹⁷, it was recognised that, although “liberalisation of European telecoms market from 1998 has brought more competition to the markets, and in turn brought major benefits to consumers in the form of lower prices and better services [...] consumers and businesses are still faced with 27 different markets and thus not able to take advantage of the economic potential of a single market”. In order to provide further insight into this issue, this Section proposes a brief critical account of the existing regulation, in particular at the EU level, on eComms. The objective is not to be exhaustive in terms of the enforced EU legislation thereon, yet to identify possible regulatory strengths and weaknesses that may have contributed to the observed price and non-price dispersion and to their evolution over time.

This aspect is of particular relevance if one considers that the overarching objective of a truly European policy on eComms should be to support growth at the EU level by focussing on the internal market. In fact, the legal basis for an EU-wide eComms regulation is represented by Art 106 TFEU, *de facto* endorsing a EU policy for network industries in line with the Treaties’ competition and non-discrimination rules, and by Art. 114 TFEU, envisaging “*measures for the approximation of the provisions laid down by law, regulation, or administrative action in Member States which have as their object the establishment and functioning of the internal market*”. In other words, competition policy and internal market are closely intertwined: in fact, among the exclusive EU competences of Art 3(b) there is to promote “*competition rules necessary for the functioning of the internal market*”. *Box 1* in section 3 – Regulatory framework of network industries - has already provided an overview of the salient regulatory interventions characterising the eComms sector over the most recent years. This is important also in light of the consequences thereof on the work of the Member States’ NRAs.

An issue discussed in the literature is the role of the “ladder of investment” approach, which the NRAs were encouraged to apply to incentivise service providers to build their own infrastructure, with respect to fostering sustainable platform competition in the eComms sector (see *Box I.2*). Consistently with this regulatory approach, for instance, temporary “regulatory holidays” pleaded by telecom operators in analogy with those witnessed in the gas sector to stimulate pipelines investment, were forbidden by the Court of Justice of the

¹¹⁷ See Commission (2010), 15th Implementation Report.

European Union, considering them not in line with the spirit of the Second Telecoms Package¹¹⁸. Overall, promoting competition in services through regulated third party access to existing networks is recognised to have contributed to fostering intra-platform competition, reducing consumer prices, and encouraging new operators' entry and investments, e.g. to interconnect with the incumbents' access networks, in equipment, and in retail services. Instead, its effects on inter-platform competition are more debated¹¹⁹. Although no definitive conclusion can be drawn, there is little doubt that a serious and sustainable inter-platform competition should be encouraged, especially in non-cable EU countries (see *Box I.2*), with an eye on the long-term benefits that this could entail.

The overall impression, supported by the evidence reported throughout Section 3.2, is that the European regulatory framework, at least before the 2009 Third Telecoms Package, proved beneficial in fostering competition in e-communications, including intra-platform one by fostering access and encouraging investments, but the internal market for eComms was not brought much closer. A possible reason for this may be traced in the already mentioned prevalent "national orientation" of the sectoral regulation by the NRAs, asked to work on ambitious agendas of national market analyses and subsequent country-specific remedies

In fact, while one should recognise the positive aspects of a regulatory system designed to allow national regulators, closer to the market and ideally endowed with adequate resources, to implement the framework with the Commission monitoring the compliance and coherence with the *acquis* under the Art 7 procedure, this stance may also have contributed to¹²⁰:

- i) heterogeneous implementation of the framework, like inconsistencies in market definitions, choice of cost parameters, access price models, and implementation of remedies¹²¹, thereby forcing multi-country operators to duplicate costs and limiting opportunities to realise economies of scale;
- ii) lack of standardised wholesale offers fit for multinational corporations, thus increasing the operating costs for multinational operators;
- iii) subsequent regulatory uncertainty, making markets less attractive for entry and reducing incentives to invest, especially in riskier new generation access networks, and hindering the wider allocative benefits within a European level playing field that more emphasis on EU-wide cooperative processes may have engendered.

With respect to some of the aforementioned issues, the 2009 Third Regulatory Package seems to have taken some of them into account, in particular by improving the level of EU integration and informing the national regulatory regimes to more uniform competition-policy principles. For instance, introducing the NRAs' participation in the Body of European Regulators for Electronic Communications (see *Box I.1*) may well yield a more "European orientation" of the sectoral regulators and favour their sharing of best practices. However, since the deadline for the Member States' transposition, namely May 2011, has too recently expired, more time would be required in order to properly assess the impact of the latest regulatory amendments,

Still, the overall impression that the Third Telecoms Package inaugurated a more integrated regulatory stance at the EU level is supported by measures like the revised Roaming Regulation (see *Box I.1*) and the increasing reliance on EU-wide soft instruments. For instance, the Framework empowers the Commission to issue recommendations, which the NRAs should take into utmost account, whenever it finds that divergences in their implementation of the framework may create a barrier to the internal market: significant examples of this approach are the 2009 Recommendation on MTRs (see Section 3.2.2) and the 2010 NGA Recommendation (see *Box I.2*).

Despite its scope is much broader than e-communications, also the May 2010 *Digital Agenda for Europe* contains more ambitious measures than previous ones in terms of fostering an internal market for eComms. Two concrete examples of the incentive offered by the Digital Agenda towards a genuine internal market for eComms are the *Radio Spectrum Policy Programme* and the *2012 Roaming Regulation*. On the latter, for instance, it is worth recalling that the previous integration analysis has shown how the regulated roaming

¹¹⁸ See, for instance, Pelkmans and Renda (2011).

¹¹⁹ For an econometric analysis of the reasons why regulation may have impacted negatively on infrastructural deployment, thereby hindering long-term inter-platform competition, see, e.g., Waverman et al. (2007). Here, it is argued that, all being else equal, an increase in the "intensity" of access regulation, measured by a reduction of 10 p.p. in LLU prices, could entail a fall in the subscriber share of alternative infrastructure by 18 p.p., denoting weakened facilities-based competition.

¹²⁰ See, e.g. Ecorys (2011).

¹²¹ For instance, only a few EU countries like the United Kingdom introduced functional separation (management unbundling)

segment has witnessed significant EU-wide convergence towards lower prices and better competitive conditions since the first Roaming Regulation of 2007 and with its amendments in 2009. Still, a price disparity between 56 and 70% can still be traced in 2011, with alternative tariffs being the major contributor to this dispersion (see Section 3.2.2). In 2011, in light of the DAE “key performance target” that “differences between roaming and national tariffs would approach zero by 2015”, the Commission conducted a review of the roaming market, finding that, though the cost of using mobile phones and other devices abroad in the EU had continuously fallen, this had not yet converged towards adequately integrated competitive conditions. For this reason, it was proposed to extend the Regulation beyond the expiry date of June 2012, introducing also new measures to encourage operators to offer better deals to final users.

The mentioned regulatory evolutions thus appear more in line with the Treaties’ spirit of ensuring the level of competition *necessary for the functioning of the internal market*: to this aim, however, even more ambition in terms of cooperation and integration may be needed to better address the identified persistent differences among national eComms markets and the limited platform competition in some Member States, sometimes still coupled with significant market power held by national operators, as mentioned in Section 3.1.2.

These issues are becoming even more urgent in light of the on-going transition to NGA networks. In fact, here, regulatory inconsistencies may compound the discussed “broadband gap”, in terms of coverage, take-up and quality, among Member States whenever this transition calls NRAs to come up with remedies like forced sharing of in-building wires, duct sharing to access dark fibre, and bit-stream access. This risk should be taken into account as a broadband gap entails also that EU consumers and firms face different opportunities depending on where they live. On top of this, as NGAs usually require higher access prices and fewer access points, extra care should be paid in applying the “ladder of investment” to avoid discouraging new entrants and making existing players fail to jump on the optical fibre layer even when high in the copper one.

Overall, the significant challenges currently faced by the e-communications sector are making it more and more urgent the need to closely and constantly monitor the evolution of this industry, not only in terms of competition, where more progress can be traced also with respect to other network industries (see above section 2, 3 and 4 on network industries) in some cases also thanks to adequate regulation, but also in terms of integration to better reap the benefits of its market opening across Europe.

3.2.5. Outlook on specific Member States

Throughout this Section different measures of dispersion between country-specific price and non-price performances have been computed and discussed as far as different eComms markets are concerned. The objective is to understand whether and to what extent a genuine internal market for e-communications has been achieved, taking into account also recent regulatory developments. Indeed, the reported evidence seems to confirm that significant differences among Member States still coexist with improved competitive conditions after two decades of liberalisation in e-communications, including in regulated segments like roaming. Indeed, high and not decreasing dispersion measures both in price and non-price (e.g. broadband gap) performance, support the conclusion that a more integrated EU regulatory approach may be needed. However, this annex I recognises also the impossibility to adopt a one-size-fits-all approach to analysing national eComms markets, given the importance, beyond the regulation *per se*, of national factors like the country-specific geography and topology of the legacy infrastructure, in explaining some persistent diversity among their performances, and the subsequent lack of a genuine internal market for e-communications.

For these reasons, this Section further enriches the analysis by providing a simple benchmarking exercise, based on a limited set of the indicators, mostly already employed throughout annex I, to identify Member States’ eComms markets that may deserve more in-depth investigation in light of their relatively weaker performance in the EU27. One could classify the chosen indicators as follows (whenever not reported in footnote, a detailed explanation of the indicator has already been provided in the previous Sections):

- 1) **Regulatory environment indicators**, including: i) the state of transposition of the regulatory framework; ii) the assigned MHz of radio spectrum, making a distinction between the digital dividend (some 60MHz available) and all other harmonised bands (about 1000 MHz available in total), since the RSPB calls the Member States to identify and individually assign at least 1200 MHz for wireless broadband by 2015; iii) the independence of the national regulatory authority for eComms, assessed based on the expert judgement of the Commission Services (DG CNECT).

- 2) **Mobile segment indicators**, including: i) the main mobile operators' market shares; ii) the level of mobile termination rates; iii) the average revenue per minute of mobile communications; iv) the mobile broadband penetration; v) the HSPA coverage¹²².
- 3) **Fixed broadband segment indicators**, including: i) the fixed broadband incumbents' market shares; ii) the fixed broadband penetration; iii) the rural standard broadband coverage; iv) the take-up and coverage of NGA (fast and ultra-fast) networks; v) the total share of DSL lines and the proportion of full local loop unbundling (LLU) and shared access therein¹²³; vi) the average wholesale access charges for LLU

To the aim of benchmarking, coloured labels are assigned to Member States, as shown in Table I.3 at the end of this annex I, for each indicator according to the following logic: in general and where possible, "green" is assigned to the half top performers and "orange" to the half bottom ones (thus split by the reported *median* of the distribution for that indicator); among the bottom performers, "red" is assigned to the Member States whose indicators are beyond (below or above, depending on the reported direction of "improvement") a specific (reported) "cut-off", either having an intuitive interpretation¹²⁴ or identifying the last sextile of the distribution across countries. As an exception, when the variable is qualitative, as in the case of regulatory environment indicators, the colours have explicitly reported meanings: e.g., in terms of NRA's independence, "red" means serious issues or on-going infringement proceedings, "orange" means doubts, concerns, or on-going investigations (which may eventually lead to infringement proceedings or to no action), and "green" means that the situation appears to be normal.

Overall, the Member States with relatively weaker performances identified on the basis of this benchmarking exercise, which may thus deserve further insight, are, in particular:

- i) Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Luxembourg, the Netherlands, Poland, Slovenia, and Slovakia in terms of regulatory environment;
- ii) Belgium, Bulgaria, Luxembourg, Malta, Slovenia, and Slovakia in the mobile segment;
- iii) Bulgaria, Cyprus, Czech Republic, Germany, Ireland, Italy, Luxembourg, Latvia, Poland, and Slovakia in fixed broadband.

Even if these indicators offer only a partial overview, it seems that this benchmarking exercise can stimulate further discussion on the country-specific drivers of competition and integration, detecting national eComms markets that may deserve further attention in order to better understand, also in light of the prevailing conditions therein, the reasons for their performance. E.g., some countries like Bulgaria, Luxembourg, and Slovakia are "identified" across all segments and these results are partially in line also with the Member States' scores in the *Networked readiness index 2012*¹²⁵ where Bulgaria, Greece, Romania, and Slovakia occupy the lowest sextile.

4. CONCLUSION

As far as **electronic communications** are concerned, the analysis of competition and integration reported in this annex reveals that the liberalisation process characterising this industry over the last decades has overall been a success at the average EU level in most regards.

¹²² The *High Speed Packet Access* is mobile broadband technology that extends and improves the performance of existing 3G mobile telecommunication networks utilizing specific protocols (e.g. WCDMA). This is reported more for illustration purposes than for benchmarking: in fact, the current coverage, everywhere above 85% (the lowest coverage can be traced in Slovakia and Germany, with 86% and 89%, respectively) can be considered satisfactory in all Member States with respect to a hypothetical cut-off of 80%.

¹²³ These two indicators are inversely correlated and should be thus read together with care to be able to signal the existence and degree of platform competition in the national eComms markets. In fact, countries like non-cable ones (see *Box I.2*), characterised for historical reasons by lower levels of inter-platform competition as indicated by higher shares of DSL lines, will tend to (and should) have adequately higher shares of fully unbundled or shared access lines than in Member States where alternative platforms such as cable modem are available.

¹²⁴ For instance: a) 50% for the main operators' market shares; b) the EU (weighted) average for the share of DSL lines, the NGA coverage, the rural standard broadband coverage; c) half the EU average revenue per minute of mobile communications for MTRs; d) some technical thresholds based on the expert judgement of the Commission Services, like 400MHz for the spectrum assigned (other bands), 80% for HSPA coverage, 5% for NGA take-up, and 10% the share of LLU in DSL.

¹²⁵ The *networked readiness index 2012*, annually published by the World Economic Forum's *Global Information Technology Report 2012*, measures on a scale from 1 to 7 each country's propensity to exploit the opportunities offered by ICT, in particular to better understand its impact on their competitiveness; it is made up of three components: i) the market, political, and regulatory environment for ICT offered by a given country or community; ii) readiness, i.e. infrastructure affordability and skills of the community's key stakeholders (individuals, businesses, and governments) to use ICT; iii) the usage of ICT amongst these stakeholders and its social and economic impact.

Namely, despite national differences and data limitations, the employed indicators hint at improved competitive conditions in terms of market structure and price performance. The analysis of specific segments like roaming, mobile termination rates, and mobile broadband, reveals that an often crucial role in the liberalisation has been played by the regulator both at the EU and the national level.

Overall, despite the global improvement of competitive conditions across different eComms segments in the EU there remain important differences among Member States in terms of prices, market power, consumer's choice, and implementation of the regulatory framework. In fact, different dispersion measures (price disparities generally above 100% and coefficients of variation over 30%) seem to confirm that significant fragmentation still exists among national eComms markets. Moreover, this fragmentation is not significantly decreasing over time. Instead, integration seems poor also in highly regulated segments like roaming, likely in light of the still national orientation of sectoral regulation, to the detriment of EU-wide cooperative processes.

Fragmentation is signalled also by non-price indicators, first and foremost a marked broadband gap across Member States, despite some recent progress in this regard. In fact, recent regulatory interventions such as those included in the *Digital Agenda for Europe* hint at renewed awareness on the need of more Europe also in regulating eComms, given the clear potential that a full-fledged Single Market for electronic communications could have in better reaping the benefits of the market opening in this sector.

Table I.3: Summary table of eComms indicators per Member States (latest data available between 2010 and 2011)

	Regulatory environment (2011)				Mobile segment (2010)					Fixed broadband (BB) segment (2010)									
	Framework Transposed (**)	Spectrum (800MHz) assigned (**)	Spectrum assigned (all other bands) (***)	NRA's independence (****)	Main mobile operator's market share	Mobile termination rates (Euro cents)	Average revenue per minute of mobile voice (Euro cents)	Mobile broadband penetration	HSPA coverage	Fixed BB incumbent's market share	Platform Competition			Fixed BB penetration	NGA take-up (*****)	NGA coverage	Rural standard BB coverage		
											Share of DSL lines	Share of LLU and shared access / DSL	Full LLU wholesale access charge (Euros)						
AT					41.5%	2.01	8.62	40.1%	97.5%	56.3%	69.4%	16.1%	6.3	26.4%	0.7%	64.4%	82.6%	AT	
BE					41.0%	4.19	15.65	19.1%	98.7%	44.7%	52.5%	5.1%	9.8	32.4%	9.7%	98.0%	100.0%	BE	
BG					46.3%	6.65	5.16	14.4%	98.0%	30.2%	30.0%	0.0%	8.5	16.0%	3.7%	71.4%	32.8%	BG	
CY					73.8%	1.81	7.51	42.7%	99.0%	69.9%	86.8%	17.9%	9.8	25.1%	0.0%	0.0%	100.0%	CY	
CZ					40.4%	4.36	11.85	49.5%	90.0%	34.4%	38.0%	5.8%	11.1	23.0%	1.3%	40.3%	79.0%	CZ	
DE					32.9%	3.37	11.98	35.0%	89.1%	45.1%	85.9%	40.3%	10.9	33.3%	2.7%	60.8%	58.0%	DE	
DK					46.3%	4.43	9.55	80.4%	98.1%	59.8%	55.2%	16.3%	10.4	39.3%	5.7%	61.9%	96.7%	DK	
EE					42.0%	7.02	6.86	42.0%	100.0%	57.1%	43.6%	0.0%	7.4	27.2%	3.1%	61.8%	85.9%	EE	
EL					49.8%	4.95	6.83	36.5%	99.4%	44.3%	99.8%	54.5%	9.1	21.8%	0.0%	4.2%	93.2%	EL	
ES					41.6%	4.05	14.92	65.3%	97.1%	48.4%	79.1%	32.6%	9.0	24.7%	1.6%	60.7%	91.1%	ES	
FI					39.0%	4.40	6.09	87.3%	100.0%	na	70.1%	na	14.4	29.9%	2.8%	67.8%	93.5%	FI	
FR					40.0%	2.50	11.44	38.7%	97.0%	42.0%	92.2%	47.4%	10.4	35.0%	1.0%	39.1%	98.2%	FR	
HU					45.3%	4.05	6.74	17.2%	91.3%	44.1%	38.5%	2.6%	7.2	22.1%	3.0%	54.0%	83.1%	HU	
IE					39.4%	4.60	13.28	60.0%	95.0%	44.6%	67.1%	8.4%	13.2	24.3%	1.1%	35.6%	93.8%	IE	
IT					32.8%	5.38	9.01	31.3%	95.5%	53.1%	97.8%	30.8%	10.0	22.2%	0.0%	10.7%	89.0%	IT	
LT					38.8%	3.62	2.24	29.6%	95.0%	50.7%	27.0%	0.1%	7.3	22.6%	9.0%	62.2%	67.6%	LT	
LU					53.5%	9.15	14.81	64.8%	99.6%	72.5%	89.2%	12.0%	13.3	32.0%	2.2%	75.0%	100.0%	LU	
LV					46.6%	4.23	4.92	29.7%	99.0%	54.6%	36.2%	0.0%	9.6	20.4%	6.3%	60.8%	67.0%	LV	
MT					47.2%	4.18	20.70	21.2%	99.0%	50.9%	51.1%	0.0%	11.0	30.9%	0.4%	99.3%	na	MT	
NL					49.2%	2.70	18.27	49.2%	99.0%	44.1%	57.1%	18.6%	7.0	40.6%	8.7%	100.0%	100.0%	NL	
PL					31.5%	3.45	5.85	41.4%	90.0%	30.5%	48.2%	5.9%	5.3	17.3%	0.6%	37.1%	28.1%	PL	
PT					43.7%	3.50	8.93	27.5%	92.2%	49.1%	50.4%	15.8%	10.0	21.6%	2.9%	74.5%	97.4%	PT	
RO					41.4%	5.06	2.46	14.1%	95.9%	30.0%	29.8%	0.0%	7.3	15.2%	6.9%	42.9%	86.3%	RO	
SE					41.4%	2.27	8.41	97.5%	99.6%	37.4%	51.4%	32.4%	14.0	32.6%	6.0%	50.6%	86.7%	SE	
SI					52.6%	4.26	10.65	29.1%	95.6%	41.8%	55.3%	27.0%	9.1	24.6%	1.0%	67.7%	59.9%	SI	
SK					44.6%	5.51	9.75	32.3%	85.5%	41.8%	41.9%	0.0%	5.4	17.8%	3.0%	65.3%	77.3%	SK	
UK					32.7%	3.98	10.05	63.9%	98.8%	31.0%	79.2%	52.0%	11.8	31.7%	1.7%	58.3%	100.0%	UK	
EU average					37.09%	3.87	10.66	43.2%	95.0%	43.3%	75.9%	36.49%	9.7	27.7%	2.3%	50.1%	78.4%		
Improvement			Above		Below	Below	Below	Above	Above	Below	Below	Above	Below	Above	Above	Above	Above		
Median					41.6%	4.19	9.01	38.7%	97.5%	44.7%	55.2%	13.9%	9.8	24.7%	2.7%	60.8%	87.8%		
Cut-off			400MHz		50.0%	5.33 (*)	13.33 (*)	22% (*)	80.0%	50.0%	75.9%	10.0%	12 (*)	20% (*)	5.0%	50.1%	78.4%		

	Advanced
	Intermediate
	Laggard
	derogation

(*) In these cases the proposed cut-off identifies as "red" the Member States in the last sextile of the distribution

(**) "red" means "no", "green" means "yes"

(***) "red" means "up to 400MHz assigned", "orange" means "up to 800MHz assigned", "green" otherwise

(****) "red" means "serious issues or on-going infringement", "orange" means "doubts, concerns or on-going investigations", "green" means "normal"

(*****) "red" means "up to 5% take-up", "orange" means "up to 10% take-up", "green" otherwise

Source: personal elaboration based on previously quoted sources

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ANNEX II –ELECTRICITY AND NATURAL GAS

The main objective of promoting competition in energy is to minimise the costs of energy supply and to ensure that energy prices are in line with costs. The main direct economic benefits to be expected from these reforms include lower prices (or catching-up effect when prices are maintained artificially low by state intervention and do not reflect the true market conditions), and cost-effective achievement of the other two objectives of EU energy policy, i.e. security of supply and sustainability development. As seen previously, the ex-ante regulation at EU level has been strengthened over recent years both in electricity and gas. More specifically, the implementation of the Third Energy Package adopted in 2009 certainly contributes to enhancing competition in both electricity and gas.

In this part, the competition assessment will be done in parallel for both electricity and gas while acknowledging their differences when needed.

1. INTRODUCTION: ASSESSING COMPETITION IN ELECTRICITY AND NATURAL GAS MARKETS

Promoting competition in energy markets reflects a concern that economic efficiency is not as good as it could be in the EU, and hence prices to consumers are higher than what they should be. Market functioning is one of the key determinants of prices in the energy market, which explains why one needs to look at each step of the value chain.

The electricity market has the following activities: (1) electricity generation, (2) the transport of electricity on high voltage levels (transmission), (3) the transportation on low voltage levels (distribution), and (4) the supply of electricity to final consumers (retail). It also includes (5) the activity of trading electricity on wholesale markets. The gas market involves similar activities: (1) gas production (including exploration), (2) international transport of the gas to the region of consumption through pipelines or by sea in liquefied form for imported gas, (3) national transport in transmission network, (4) ancillary services (storage and blending); (5) distribution; (6) supply to end-consumers (retail). It also includes wholesale supply within the EU (bilateral or trading at hubs).

Each activity has its own characteristics and market functioning. The final outcome for consumers is the (retail) price they are going to pay. However, retail prices are determined by many factors – energy component, distribution, taxes, state regulation, renewable policy –, which entails the need to look at the whole supply chain when analysing the causes of relative low/high prices¹²⁶.

2. RETAIL PRICE LEVELS: STYLISED FACTS

Retail prices in natural gas and electricity are different for households and non-households¹²⁷. As retail prices are regulated in some countries, Member State comparisons have to be made cautiously. Furthermore retail prices are determined by many factors – energy and non-energy elements, national and EU policies – which makes retail energy price convergence across countries more difficult to assess.

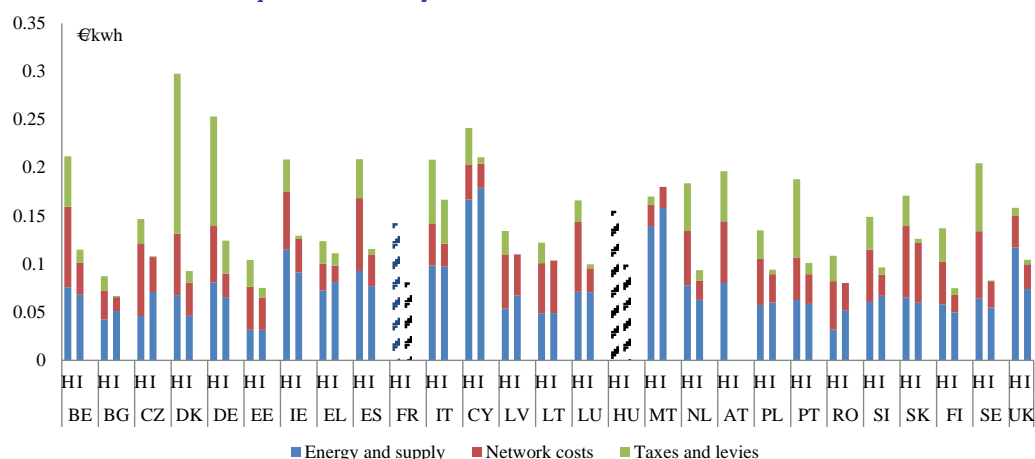
2.1. ELECTRICITY AND NATURAL GAS PRICES LEVEL IN MEMBER STATES

Graphs II.1.a and II.1.b display electricity and natural gas prices for households and industrial customers during the second half of 2011. The level of electricity prices varies across countries with Cyprus, Malta and Italy displaying the highest prices for industrial customers and Germany, Denmark, Cyprus and Belgium being the most expensive countries for households. In natural gas, the same heterogeneity is observed: Sweden and Denmark are the most expensive for both households and industrial customers. Italy ranks high for households while Germany and Slovenia display relatively high prices for industrial customers.

¹²⁶ In this document, the questions of energy policies and taxation are not raised as they are not directly linked to competition.

¹²⁷ Within non households, there are distinctions between large and small users, which correspond roughly to SMEs and large companies/industries.

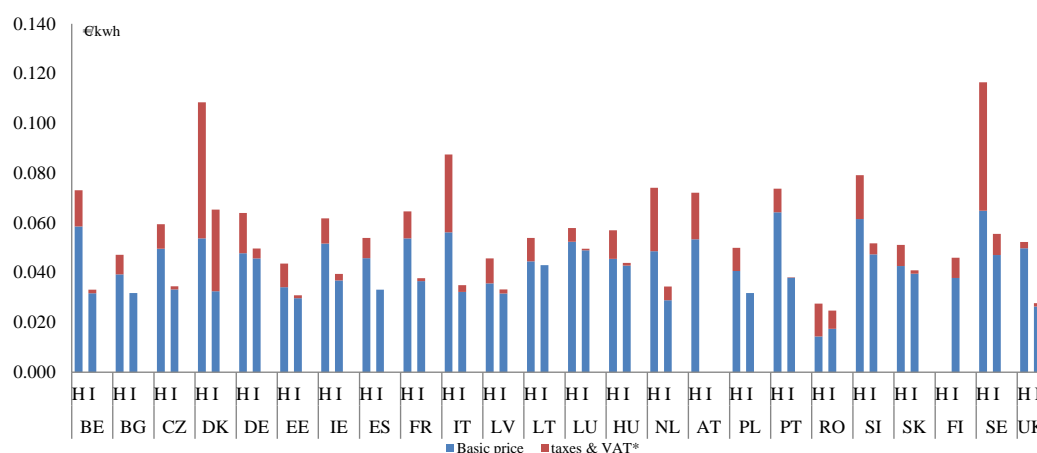
Graph II.1.a: Electricity Prices in Member States – First half of 2011



Source: Eurostat.

For France and Hungary, decomposition of price not available.

Graph II.1.b: Natural Gas prices in Member States – First half of 2011



Source: Eurostat.

* For industry, non-recovered taxes.

The decomposition of prices provides additional information on the possible reasons why price levels are heterogeneous across Member States.

In **electricity**, prices are decomposed into energy & supply costs, network costs and taxes. The first part – **energy & supply costs** - is driven by electricity production conditions such as the energy mix and competition aspects. In all the Member States, the "energy and supply" component accounts for a relative high share of total prices (excluding tax). The countries displaying the highest energy and supply prices are Cyprus, Portugal, Italy and Ireland for industrial customers and Cyprus, Malta, the United Kingdom, and Ireland for households. The second component of electricity prices - **network costs** - represents the costs of building and maintaining the network. Its level depends on many factors such as the quality of the infrastructure network (losses), the physical conditions of distribution and transmission (topography, etc...) and the access charge which can sometimes include climate and renewable fees¹²⁸. Network costs account for a significant share of the electricity price. The highest network costs are found in Slovakia, Lithuania, Latvia and Czech Republic for industrial customers and in Belgium, Spain, Czech Republic and Slovakia for households. Noticeably, network costs are lower in the industrial customer segment, as large industrial customers connect directly to the network. In some countries, some industrial customers (energy intensive) benefit from lower network costs due to reduced levies¹²⁹. Finally, the last component - **tax and value added** - contributes not only to increasing electricity

¹²⁸ Any cross country comparison needs to be made cautiously. In some Member States, renewables schemes are included in the tax part while in other Member States they are included in the network component.

Comparing prices including taxes (excluding VAT) might be the most adequate as all components (energy and non-energy) are included. See section 5.

¹²⁹ In Germany, electricity intensive manufacturing benefit from reduced renewables and CHP levies. See Rosenberg *et al* (2011).

prices, but also to increasing price dispersion across countries (see table II.1.a, II.1.b below). The share of taxes, levies and VAT varies from about 4% in the United Kingdom to more than 50% in Denmark.

Similarly, in **natural gas**, the contribution of taxes and levies to price heterogeneity is observed with some countries displaying a high share of taxes in total prices (Denmark, Romania, Sweden, Italy, the Netherlands). Natural gas basic price levels remain heterogeneous across Member States. Here again, it depends on different parameters such as natural gas production/supply competition, and also foreign factors such as the origin of imports and their diversification.

Finally, section 5 provides end-user prices (excluding VAT) for both industrial customers and households in natural gas and electricity for two periods - S2 2007 and S2 2011. Comparing between 2007 and 2011, electricity and natural gas price increases have been higher for industrial customers than for households, except in some countries (Romania, Hungary, the Netherlands, Denmark, the United Kingdom, Poland) where electricity and natural gas prices have decreased in one or both segments.

In some countries, the persistence of high prices both in 2007 and 2011 would require a closer look at structural aspects such as the energy mix, competition and other energy related factors. In electricity, both in 2007 and 2011, Italy, Cyprus and Malta display the highest prices for industrial customers and Denmark, Germany, Italy and Cyprus display the highest prices for households. In comparison, Bulgaria, Estonia and Romania display lower prices both in the industrial customers and households segments (although the ranking changes with prices in PPS). In natural gas, over the two periods, Germany and Sweden display relatively higher prices in both the industrial customer and household segments; Romania, Bulgaria, Latvia and Lithuania display relatively low prices in the household segment.

Although imperfect, price comparisons may give some insights into potential problems. For example, in Romania, the fact that natural gas prices are low for households and non-households is a consequence of the high regulation of both prices and quantities. Domestic natural gas producers have to supply the domestic market, which *de facto* leads to restrictions on exports and imports and isolate the domestic market from market evolutions. Another example is the relatively high price levels in Italy, which reflects insufficient competition and infrastructure bottlenecks in both the electricity and gas markets. The authorities have recently adopted measures aiming to increase competition in the gas and electricity markets.

2.2. PRICE CONVERGENCE AND MARKET INTEGRATION

The objective of establishing an internal energy market is to increase integration, hence lowering prices while increasing choices for consumers. One expected outcome is price convergence across countries as consumers are allowed to choose between different suppliers from their own country and from other EU countries.

Measuring price dispersion can be a good way to assess whether market integration took place. Between 2007 and 2011, price dispersion increased for industrial customers both in electricity and natural gas (see Table II.1.a). Note that the dispersion increased for both pre-tax and tax segments. By contrast, price dispersion has decreased for households during the same period (in the pre-tax segment). Noticeably, price dispersion increases when taxes are included, which confirms the contribution of taxes to the heterogeneity of energy prices (table II.1.a and table II.1.b).

Table II.1.a: End-user prices – Electricity and Natural gas

	Average		Min		Max		Coef variation	
	S2 2007	S2 2011	S2 2007	S2 2011	S2 2007	S2 2011	S2 2007	S2 2011
Electricity								
Non Households								
Prices (excl taxes) - €/kwh	0.085	0.101	0.052	0.065	0.137	0.204	0.258	0.316
Prices (excl VAT) - €/kwh	0.091	0.109	0.053	0.067	0.139	0.211	0.261	0.302
Prices (incl taxes) - €/kwh	0.109	0.135	0.063	0.080	0.207	0.242	0.298	0.303
Households								
Prices (excl taxes) - €/kwh	0.106	0.128	0.060	0.073	0.169	0.204	0.253	0.244
Prices (excl VAT) - €/kwh	0.118	0.146	0.060	0.073	0.192	0.238	0.303	0.285
Prices (incl taxes) - €/kwh	0.137	0.172	0.072	0.087	0.240	0.298	0.312	0.282
Natural gas								
Non Households								
Prices (excl taxes) - €/kwh	0.027	0.036	0.018	0.017	0.039	0.049	0.182	0.212
Prices (excl VAT) - €/kwh	0.029	0.040	0.018	0.025	0.044	0.065	0.202	0.247
Prices (incl taxes) - €/kwh	0.035	0.048	0.021	0.031	0.073	0.094	0.286	0.311
Households								
Prices (excl taxes) - €/kwh	0.039	0.048	0.020	0.014	0.062	0.065	0.304	0.230
Prices (excl VAT) - €/kwh	0.044	0.054	0.020	0.022	0.106	0.093	0.438	0.301
Prices (incl taxes) - €/kwh	0.052	0.064	0.024	0.028	0.133	0.117	0.463	0.316

Source: Eurostat

Electricity: Household: 2500<consumption<5000 kwh; Non household: 500 MWh<consumption<2000 MWhw.

Natural gas: Household: 20Gj<consumption<200 Gj; Non household: 10000Gj<consumption<100000Gj.

Table II.1.b: End-user prices Components – Electricity

S2 2011	Average	Min	Max	Coefficient variation
Electricity household (in €/per kwh)				
Energy & Supply (in €/per kwh)	0.075	0.032	0.167	0.429
Network costs (in €/per kwh)	0.054	0.022	0.084	0.307
Taxes and Levies (in €/per kwh)	0.044	0.008	0.166	0.798
Electricity industrial customers (in €/per kwh)				
Energy & Supply (in €/per kwh)	0.073	0.032	0.179	0.455
Network costs (in €/per kwh)	0.030	0.015	0.062	0.371
Non recoverable taxes (in €/per kwh)	0.008	0.000	0.046	1.284

Source: Eurostat

In conclusion, **retail prices remain heterogeneous**. Taxes contribute to this heterogeneity, especially in the household segment. Most interesting is the wide dispersion in the component "energy & supply"; these divergences can be explained by various factors, including the energy mix, competition and state intervention¹³⁰.

3. ASSESSING COMPETITION IN EACH STEP OF ENERGY ACTIVITIES

As mentioned above, retail energy prices are composed of different items: (1) the energy component (determined by generation/production activities and wholesale trading); (2) network costs (determined by distribution and transmission activities) and (3) taxes. Therefore, it is important to look at the various

¹³⁰ Cruciani (2011) analyses electricity prices and stresses that non energy factors such as taxes and VAT contribute to price heterogeneity.

components of energy activity. Taxes and VAT will be excluded from the analysis as they reflect national energy and fiscal strategy choices. Also, the potential influence of the energy mix on end user prices will not be assessed, although it can play a significant role when countries are oil import dependent (Malta and Cyprus for example)¹³¹.

This section will assess the state of play and possible problems in the generation/production segment, infrastructure (transmission and distribution), and the wholesale and retail markets.

3.1. ELECTRICITY GENERATION AND NATURAL GAS PRODUCTION/SUPPLY

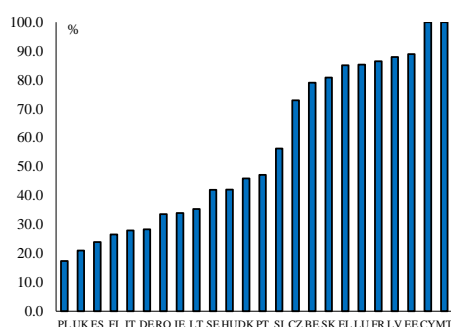
3.1.1. Market shares in the generation market

The EU legislation has promoted competition in the generation market which should be open to new entrants – domestic and foreign ones (see section 3 – Regulator framework of network industries).

In 2010, only in a few countries, market opening is not fully achieved – Estonia in electricity, Hungary in electricity and natural gas, and Malta in electricity. However, market opening does not mean that competition is fully effective. Markets can be open from a legal perspective, but some bottlenecks might remain, which hinder access to the market. The number of antitrust cases in energy has shown that incumbents can display anticompetitive behaviour (see section 3 – Regulator framework of network industries).

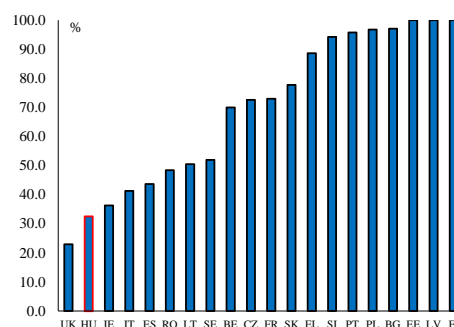
The share of the largest electricity generator can be a good indicator of the competitive situation as it often corresponds to the market share of the historical incumbent¹³². In most countries, **concentration remains high despite significant improvements over the past decade** (graphs II.2.a and II.2.b). In electricity, in 2010, in 8 countries (Estonia, Greece, France, Cyprus, Latvia, Luxembourg Malta, Slovakia), the share of the largest generator was above 80%. In the natural gas market, the same was observed for 8 countries (Belgium, Bulgaria, Greece, Latvia, Poland, Portugal, Slovenia, Finland). In 2010, in electricity, 8 countries declared only a single company having a market share above 5% by volume (Czech Republic, Estonia, Greece, France, Cyprus, Latvia, Malta, Slovakia); in natural gas, there were 7 countries that declared the same (Bulgaria, Estonia, Finland, Luxembourg, Latvia, Poland, Slovenia)¹³³.

Graph II.2.a: Market share of the largest electricity generator (2010)



Source: Eurostat.

Graph II.2.b: Market Share of the largest entity bringing natural gas into the country (2010)



Source: Eurostat.

3.1.2. The interaction between the electricity and the gas markets

As regards electricity, since the costs of electricity production from generating plants depend on technology and the energy source, the electricity wholesale market is characterised by merit order; i.e. the units with lower short

¹³¹ On these aspects, see Commission's forthcoming publication on energy dependence.

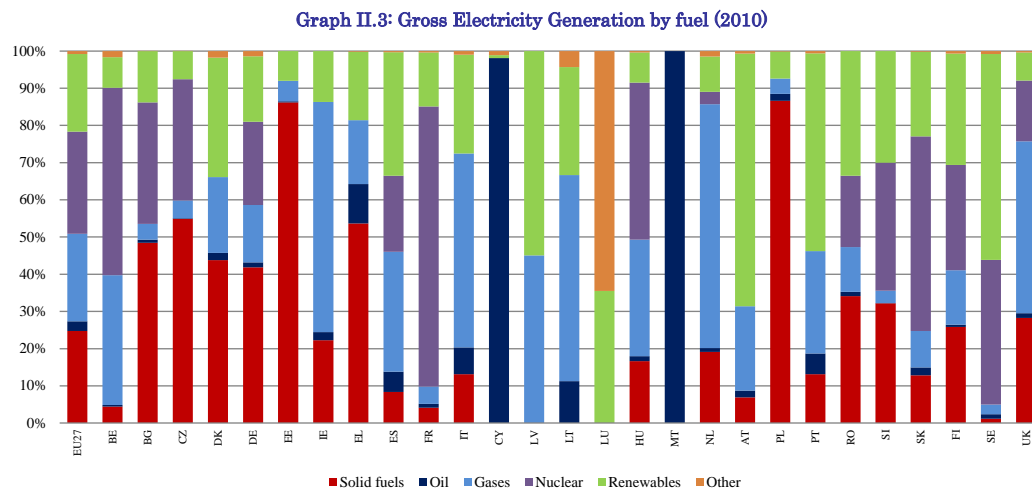
¹³² However, the nature of the activity leads to a *de facto* concentration of the market. Any assessment of market concentration should be complemented by other parameters, such as infrastructure capacity and the possibility of cross-border trade.

¹³³ Latvia has derogation in the gas market.

run marginal costs are first used.¹³⁴ In some countries, coal is the energy source fixing the price equilibrium, while in other countries, it is gas; this highlights the importance of the electricity mix in the country (graph II.3).

It follows that **insufficient competition in the gas market might have a negative impact on electricity**. For example, in Italy, insufficient competition in the gas market partly explains why electricity prices are so high. In

2010, coal was the dominant fuel to produce electricity in 8 Member States (Bulgaria, Czech Republic, Denmark, Germany, Estonia, Greece, Poland, Romania), while gas played this role in 5 Member States (Ireland, Italy, Lithuania, the Netherlands, the United Kingdom).



Source: Energy, Statistical Pocketbook 2012.

3.2. INFRASTRUCTURE OPERATORS AND INFRASTRUCTURE INTERCONNECTION

The provision of sufficient infrastructure – at national and cross-border level – is crucial to ensure competition. Infrastructure should be able to cope with demand, and also ensure that imports can flow into the country.

It is customary to distinguish between two types of transport: transmission and distribution. Transmission corresponds to the transport of natural gas or electricity at very high voltage levels from the central power to the distributor or final customers (not including supply). Distribution is the transport of natural gas or electricity at high-, medium- and low-voltage with a view to delivering to customers (not including supply). In general, transmission and distribution activities are considered a natural monopoly, since duplication of distribution lines would be inefficient due to the large fixed costs of the investment. These companies have been granted legal rights to operate in a specific area. There are so-called network externalities, i.e. investments benefit all interconnected parties by increasing reliability and security and reducing the cost of generation.

Transmission system operators (TSO) and distribution system operators (DSO) remain monopolies in a liberalised market, but they need to be regulated especially in order to ensure their efficient operation and non-discriminatory third party access to the network.

3.2.1. Independence of infrastructure operators

The first aspect of regulation is to ensure the independence of transmission and distribution activities from the competitive segments (generation/production, end supply). Unbundling between monopolistic transmission/distribution activities and competitive generation/supply activities is essential. The main reason for this vertical separation is to avoid discrimination. If these monopolies are vertically integrated with the competitive activities of generation and end user supply, they have an incentive to use their monopoly power against competitors. A grid monopolist can distort competition in many ways. For instance, discriminatory access conditions, high or discriminatory access charges and “strategic” investment in grid augmentation may

¹³⁴ which means that the equilibrium is based on the most expensive power plant. This varies across countries depending on their energy mix.

put competitors at a disadvantage. Vertical separation thus aims to limit the ability as well as the incentive of grid monopolies to distort competition.

On the transmission level, there are several ways to unbundle: separation of accounts and an independent operator (ITO – Independent Transmission Operator), operational separation where a company can operate the network without owning the network (ISO – independent system operator); and full divestiture of both entities (ownership unbundling). Ownership unbundling is the optimal model as it eliminates any incentives to discriminate. The Third Package gives Member States the possibility to choose between different models (among which full ownership unbundling), and TSOs had to apply for certification with their national regulatory authority by March 2012. The Commission gives an opinion on preliminary decisions taken by the national authorities with regard to the compliance of the TSO with one of the three unbundling models. According to the latest information (2010)¹³⁵, **16 Member States have chosen to apply the ownership unbundling model on at least one TSO in electricity** (Belgium, Czech Republic, Denmark, Germany, Estonia, Spain, Finland, Italy, the Netherlands, Poland, Portugal, Slovakia, Slovenia, the United Kingdom, Romania, Sweden) and **13 Member States in gas** (Denmark, the Netherlands, Poland, Portugal, Belgium, Germany, Spain, Italy, Hungary, Romania, Sweden, the United Kingdom).

As regards distribution, an incentive to discriminate might arise if the owner of the distribution network is also an end user supplier. In the case of distribution, the Third Package also promotes the independence of distribution (DSO), although the Directives only foresee specific unbundling models for the transmission operators (TSO).

3.2.2. Tariff setting and investment

The second aspect of network regulation is tariff setting. In the short term, the main regulatory issue is how to allocate scarce transmission and distribution capacity efficiently. In the longer run, it is important to provide adequate incentives for investment and cost efficiency without compromising the financial sustainability of the regulated companies¹³⁶.

3.2.3. Interconnection

Finally, transmission and distribution lines provide the physical link that makes competition feasible. This is even more important when it comes to ensuring cross-border exchanges and interconnection with other countries. For example, in the past, in order to protect their generation affiliates from imports, some network companies have chosen not to expand interconnection with neighbouring Member States. Hence, unbundling from generation should provide transmission operators enough incentives to interconnect their systems across countries.

In electricity, as mentioned by the ERGEG report 2010, **most countries display lower import capacities compared to their peak load, which means that the overall cross-border interconnection is low**. Latvia, Luxembourg and Lithuania display the highest levels of interconnection (Graph II.4.a). However, Baltic countries are not interconnected with other EU countries, which limit their market integration with the rest of the EU.

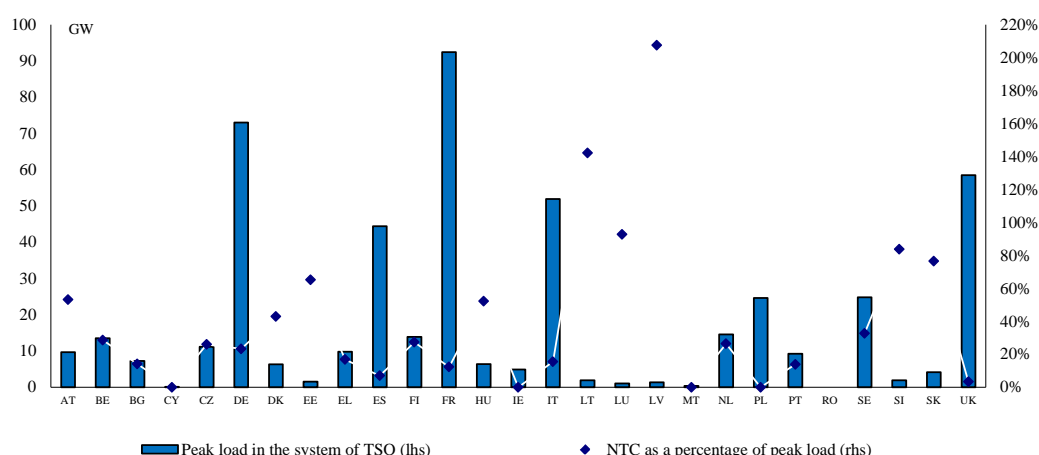
In gas, physical interconnections, import capacity together with the diversification of supply routes and sources are important aspects of competition and security of supply. In terms of market integration, as observed in electricity, Baltic countries need to improve their physical interconnections with other EU countries. The ERGEG report 2010 mentions that the free pipeline import capacity was reported to be very low in countries such as Austria, Italy, the Netherlands and Finland, which shows that gas transport routes operate at near full capacity. By contrast, the United Kingdom, Hungary, Lithuania, Northern Ireland, Luxembourg, Poland and Spain reported more than 30% of free capacity. Finally, the majority of countries are heavily dependent on imports, which makes them more vulnerable to supply disruptions, especially where they do not have any domestic production and limited storage capacity (Bulgaria, Estonia, Finland, Lithuania, Luxembourg, Sweden, Slovenia). The resilience of the gas sector is measured by the ability of countries to meet infrastructure during a

¹³⁵ SWD (2012)368.

¹³⁶ The last Infrastructure Package proposed in October 2011 (COM(2011)276 final) identifies energy investment needs in the 10 coming years. Around €200 bn are needed for the construction of gas pipelines and electricity grids, with €140 bn for high-voltage electricity transmission systems, storage and smart grid applications, €70 bn for gas pipelines, storage, Liquefied Natural Gas (LNG) terminals and reverse flow infrastructure and €2.5 bn for CO₂ carbon dioxide transport infrastructure.

day of exceptionally high gas demand occurring with a statistical probability of once in 20 year (regulation 994/2010). Only **fourteen countries report an ability to be resilient to potential gas disruptions** (see Graph II.4.b).

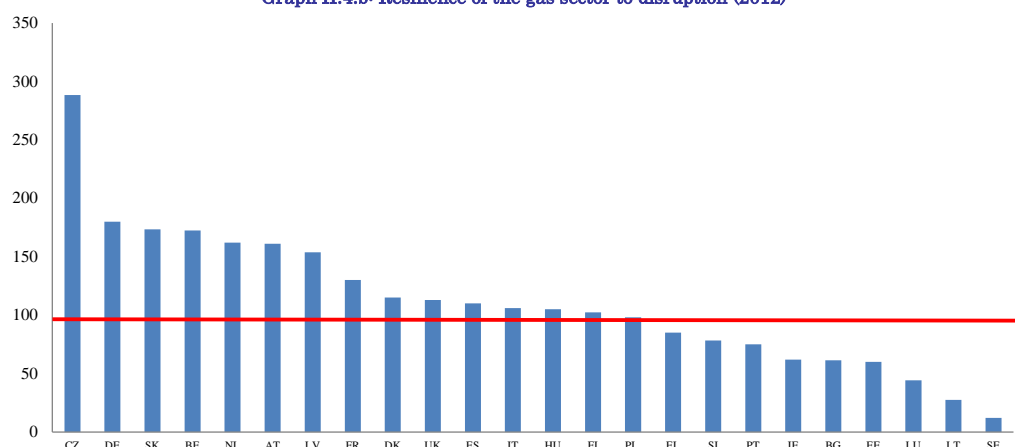
Graph II.4.a: Electricity Network Interconnections*



Source: ERGEG (2010).

Electricity network interconnection is measured as the ratio between network interconnection and the maximum load (peak load) in the system of TSO.

Graph II.4.b: Resilience of the gas sector to disruption (2012)



Source: DG Energy. Resilience of the gas sector based on article 9 of regulation 994/2010.

The $N - 1$ formula describes the ability of the technical capacity of the gas infrastructure to satisfy total gas demand in the calculated area in the event of disruption of the single largest gas infrastructure during a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years.

Gas infrastructure includes the gas transmission network including interconnectors as well as production, LNG and storage facilities connected to the calculated area.

The technical capacity of all remaining available gas infrastructure in the event of disruption of the single largest gas infrastructure should be at least equal to the sum of the total daily gas demand of the calculated area during a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years. The results of the $N - 1$ formula, as calculated below, should at least equal 100 %.

However even when physical infrastructure interconnections do exist, cross-border trade is still hindered by a lack of harmonisation of market rules and other obstacles such as the implementation of market coupling in electricity and/or integrated cross-border transmission services in gas¹³⁷.

137 See Non paper published by the Commission (2011)

3.3. ENERGY WHOLESALE MARKETS

Wholesale markets are places where electricity and gas producers can sell their products to retailers and/or end users. Their liquidity and maturity, which are determined by the volume of activity, is an important element for ensuring that competition is effective¹³⁸. Transactions between generators, end users and a number of possible intermediaries, including retailers, power exchanges and brokers, take place freely (within the constraints imposed by the network). Thus, on the demand side, end users are free to choose their supplier and to negotiate their contracts; on the supply side, generators can sell their electricity to any other market player. Wholesale prices (as well as retail prices) should reflect market conditions.

In electricity, regional initiatives have been put in place following the Second Energy Package. Regional markets are more or less interconnected and some are more developed than others. The most important trading places are NordPool (Nordic countries – Finland, Denmark, Sweden, Norway, since 2010 Estonia and since June 2012, trading started on the Lithuanian platform), IPEX (Italy), EEX (Germany), followed by Powernext (France), APX (Netherlands) and APX (United Kingdom). Very often, power exchanges in new Member States have a lower liquidity¹³⁹.

In gas, the most important trading places are located in North Western Europe, with APX UK, APX NL, Powernext, and EEX as the main platforms. Many new Member States do not have a trading platform for gas¹⁴⁰. More and more, gas trading prices are used as a reference for long term bilateral contracts, although long term contracts indexed on oil remain an important practice across the EU¹⁴¹.

3.3.1. Liquidity in electricity and gas wholesale markets

The development of trading places is more advanced in electricity than in gas, as bilateral long term contracts are the most dominant form of exchanges in gas. Hence, it is not surprising to note that **market liquidity is higher in electricity than in gas in the main trading places, although gas trading volumes have displayed a strong increase over the past four years** (Graphs II.5.a and II.5.b).

In electricity, traded volumes as a percentage of national demand are the highest in Nordic countries (Sweden, Denmark and Finland, on average 78% in 2011) and MIBEL (Spain and Portugal – on average 67% in 2011). By contrast, in 2011, it is only 10% on average in CWE (Belgium, France, Germany, the United Kingdom, Austria and the Netherlands) and 5% on average in new Member States (Poland, Romania, Slovakia and Slovenia)¹⁴².

In the natural gas market, in 2011, 58% of gas supply is oil indexed (23% from Gazprom, 10% from Sonatrach) while the rest was market priced (17% from UK spot)¹⁴³.

¹³⁸ As in any financial market, there are different types of exchanges. Exchanges provide day-ahead markets (or spot markets) where the market is cleared on the day before the delivery; intra-day markets where purchase and sale take place within a given trading day; and futures where the commodity is exchanged at a predetermined price in the future. The OTC (over-the-counter) market is the trading of power directly between parties and through an exchange. Prices on power exchanges are driven by the marginal production technology (coal, gas or other) and local conditions such as the transmission capacity between market areas. See Ecorys (2008).

¹³⁹ ACER(2012).

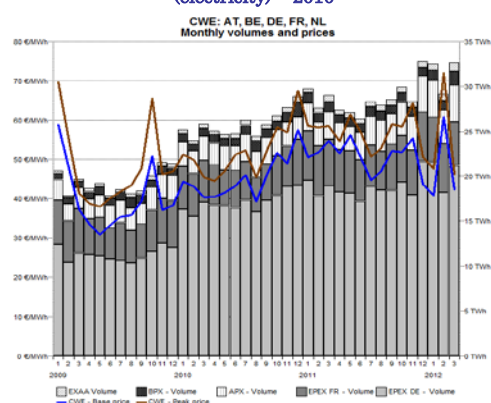
¹⁴⁰ In many places, spot markets have remained embryonic.

¹⁴¹ See Karan and Kazdagli (2011); Melling (2010).

¹⁴² ACER (2012).

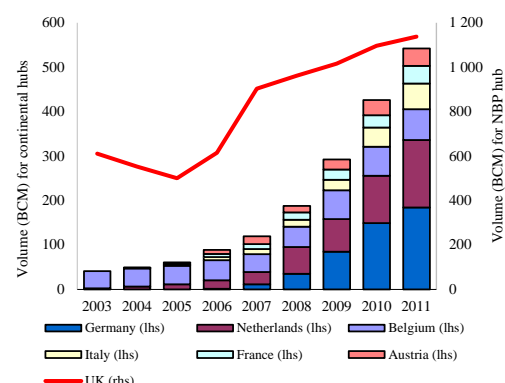
¹⁴³ Heather (2012).

Graph II.5.a: Volumes of transaction on main power exchanges (electricity) – 2010



Source: Market Observatory for Energy (2012).

Graph II.5.b: Volumes of transaction on main (continental) hubs (gas) – first quarter 2011



Source: Market Observatory for Energy (2012).

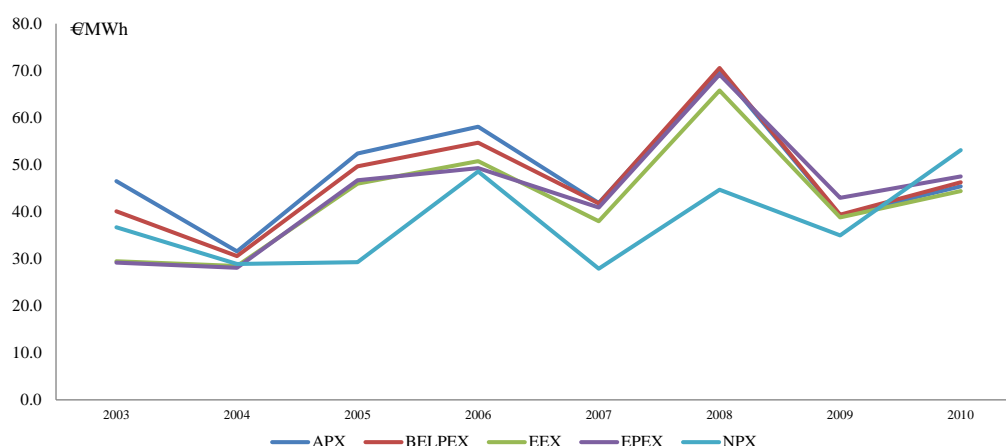
3.3.2. Wholesale price convergence

The European wholesale markets are composed of regional markets which are interconnected. **Regional wholesale price convergence has been observed in both electricity and gas markets, which highlights the success of the internal market in this field.**

In electricity, the increased correlation between day-ahead power prices has been observed in several reports, which would confirm the progressive integration of wholesale electricity markets across the EU¹⁴⁴. Between 2003 and 2010, price evolutions in APX, EEX, BELPEX and EPEX have been similar while the Scandinavian market (NPX) has displayed its own evolution (Graph II.6.a). Recently, the Nordic markets have shown signs of decoupling across regions, with Denmark and Estonia displaying lower prices at the beginning of 2011 (see Graph II.6.b)¹⁴⁵.

In gas, although volume liquidity varies across trading places, price correlation between them remains tight except in the case of the Austrian and Italian hubs (Heather, 2012). The recent evolution of forward gas prices observed across trading hubs follows similar trends (Graph II.6.c).

Graph II.6.a: Evolution of average spot prices



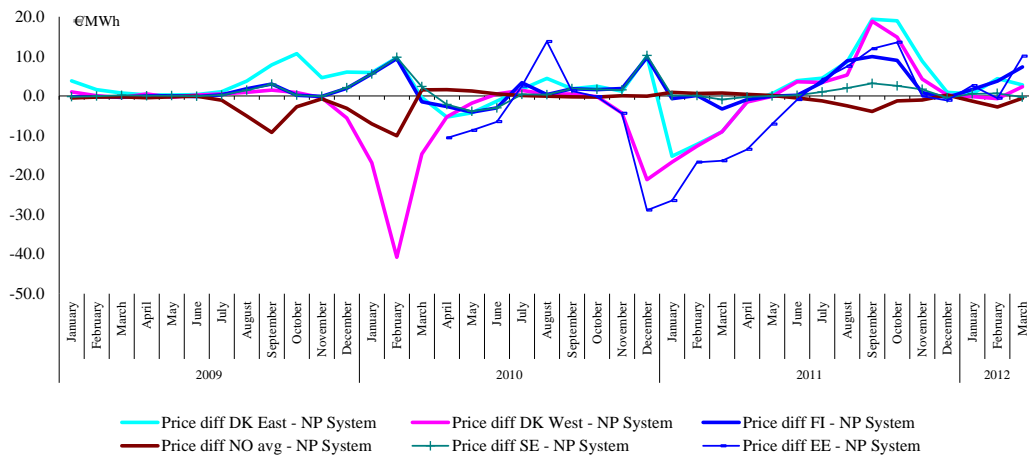
Source: Descriptive Statistics from Huisman and Kilic (2011). Day-ahead baseload prices being the equally weighted average price over the 24 hours. Calculation of the mean between 2003 and 2010.

APX: Amsterdam Power Exchange; BELPEX: Belgian Power Exchange; EEX: European Energy Exchange; NPX: Nordic Power Exchange; EPEX: French Power Exchange.

¹⁴⁴ See reports quoted in European Parliament report (2010); Huisman and Kilic (2011). Huisman and Kilic (2011) observes that the correlation between the Netherlands, Belgium and Germany increased respectively from 67% and 41% to 90%. The correlation between France and Belgium increased from 43% to 94%. The authors observe that the correlation with Scandinavian markets is lower, but has also increased over the same period. The authors

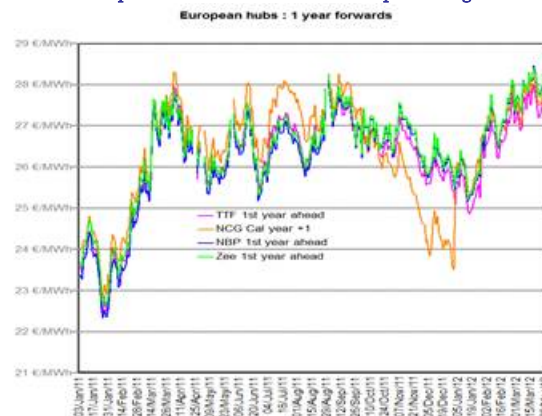
¹⁴⁵ See Quarterly report on European Electricity Market, volume 5, issue 1, 2012.

Graph II.6.b: Area price differentials with respect to the Nordpool baseload system price



Source: Market Observatory for Energy (2012).

Graph II.6.c: Evolution of forward prices in gas



Source: Market Observatory for Energy (2012).

3.4. RETAIL MARKETS

The retail market is the final component of the energy markets, where end consumers buy their electricity. The access to the wholesale market and its liquidity will determine the ability of suppliers to make competitive offers on the retail market. However, other factors influence retail price formation – the degree of competition in the retail market, as well as price regulation¹⁴⁶.

The degree of competition in retail markets can influence the end user price level by determining the ability of consumers to choose and switch. For this reason, it must be ensured that prices are transparent and that consumers are adequately informed. Several parameters influence the competitive pressure in this retail market – the number of suppliers and their market share; the ability of consumers to switch easily between different suppliers, and the transparency of tariffs. Information on switching rates is not available in all Member States, which makes cross-country comparisons quite difficult¹⁴⁷.

¹⁴⁶ As mentioned in section 4.1 – Price convergence, the correlation between wholesale prices and retail prices is higher in countries where end-user prices are not regulated. See ACER (2012).

¹⁴⁷ Article 3(5)a and 3(6)a of the Electricity and Gas Directives require Member States to Member States shall ensure that a customer can change supplier within 3 weeks while respecting contractual conditions.

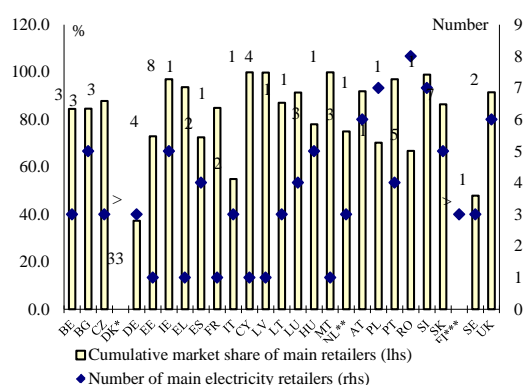
Finally, as mentioned in section 3 – Regulatory framework of network Industries, price regulation can make end user prices diverge from market prices.

3.4.1. Suppliers

Overall, the number of total suppliers in the electricity markets has decreased since 2005 (from 3036 to 2833 in EU27)¹⁴⁸. Looking at the cumulative market shares of the main retailers¹⁴⁹, it appears that, on average, a limited number of suppliers (3-4) have a cumulative market share above 80% (see Graph II.7.a). 8 countries (Ireland, Greece, Luxembourg, Latvia, Austria, Portugal, Slovenia, the United Kingdom) display market shares above 90% for their main retailers (5-6 except Greece which has 1 main retailer with 93.7% of market share). Only in Germany, Italy and Sweden smaller retailers enjoy relatively high market shares.

In natural gas, the evolution has been different as the total number of suppliers has increased since 2005 (from 1546 to 1665 in EU27)¹⁵⁰. Most of the countries have on average 3-4 suppliers with a cumulative market share above 80% (see Graph II.7.b). 12 countries (Belgium, Bulgaria, Estonia, Ireland, Lithuania, Latvia, Luxembourg, Poland, Portugal, Slovakia, Finland, Sweden) display a cumulative share of above 90% for their main retailers (maximum 6). Estonia, Latvia, Lithuania, Poland, and Finland display 1 main retailer with a market share above 90%. In Germany, and to a lesser extent in Italy, the share of smaller retailers companies is relatively high.

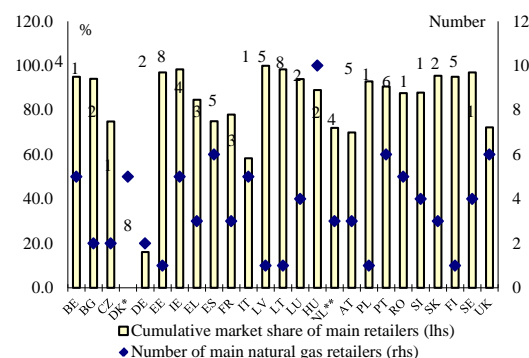
Graph II.7.a: Main retailers in the electricity market: cumulative market share and number in 2010



Source: Eurostat

Note: "Main retailers": sell more than 5% of the total national electricity consumption. Figures on top of bars provide the total number of electricity retailers. * Information not available, ** Main retailers to small consumers, *** cumulative market share not available.

Graph II.7.b: Main retailers in the natural gas market: cumulative market share and number in 2010



Source: Eurostat

Note: "Main retailers": sell more than 5% of the total national natural gas consumed by final consumers. Figures on top of bars provide the total number of natural gas retailers. * Information not available, ** Main retailers to small consumers.

3.4.2. End-user prices

Overall, as discussed previously, end-user prices reflect the different stages of competition across the value chain, in particular the energy and network parts. However, they can also be constrained by State intervention through price setting aimed at some objective (social, security of supply, etc...). A large number of countries still apply price regulation in electricity and natural gas (see table II.2).

148 Eurostat.

149 Eurostat considers retailers as "main" if they sell at least 5% of the total national natural gas consumption.

150 Eurostat.

Table II.2 - Application of end-user price regulation in electricity and natural gas

	Countries with price regulation (2010)	Countries without price regulation (2010)
Non-Households - Electricity	CY, DK, EE, FR, HU, MT, PT, PL, RO, SK.	AT, BE, CZ, DE, ES, IT, FI, LU, LT, NL, SE, SI, UK.
Households - Electricity	CY, BG, DK, EE, EL, ES, FR, HU, IE*, LT, MT, PT, PL, RO, SK.	AT, BE**, CZ, DE, FI, IT, LU, NL, SE, SI, UK.
Non-Households – Natural gas	BG, DK, FR, HU, LT, PL, RO.	AT, BE, CZ, DE, EE, ES, FI, IT, LU, NL, PT, SE, SI, SK.
Households – Natural gas	BG, DK, EE, EL, FR, HU, IE, LT, LV, PL, PT, RO, SK.	AT, BE**, CY, CZ, DE, ES***, IT, FI, LU, NL, SE, SI, UK.

Source: DG Energy and ACER (2012). This table does not take account of recent reforms and/or Commission decisions (i.e. Italy and electricity prices; France and the Law NOME). * IE: until April 2011, ** BE: 7.7% of households customers under regulated price in electricity; 10.6% in natural gas, *** ES: 35.9% of household customers under regulated price in natural gas.

Regulated end-user prices can have several adverse effects on the energy market, and also on the economy at large, especially when these prices are set below market prices and not in line with wholesale market prices¹⁵¹.

First, regulated prices tend to strengthen the position of the historical incumbent by preventing the market entry of competitors. Lower competition tends to reduce the quality of services as incumbents do not have to worry about consumers switching to competing suppliers. Suppliers without significant low cost generation will not be able to make competitive supply in the retail market. Second, regulated prices tend to reduce the incentives to invest in and modernise the distribution networks. Very often, distributors and suppliers are squeezed in between generators/producers and consumers, and in the worst cases, are making losses. Third, regulated household prices tend to harm the competitiveness of European businesses by burdening them with higher energy costs. Electricity and gas suppliers tend to cross-subsidise loss-making segments (in this case households), meaning that prices for commercial customers are higher compared to the situation with no regulated prices. Fourth, consumers do not receive the right price signals, which reduces consumers' and house-owners' incentives for energy efficiency improvements. Regulated prices induce households to buy less energy – efficient appliances and prevent house owners from investing in the energy – efficient modernisation of buildings. Fifth, public authorities often justify price regulation for social reasons. However, vulnerable customers tend to be poorly served by regulated energy prices; wealthier households, which generally consume more energy than vulnerable ones, tend to profit disproportionately from the lower prices. Moreover, vulnerable households would enjoy more effective relief from direct social support measures, instead of regulated energy prices. While getting incentive to reduce their energy consumption, they could spend the additional resources from social support on non- energy goods .Finally, price regulation prevents the introduction of smart and innovative pricing systems – in particular, smart grids and smart metering systems - which are major drivers of network modernisation toward energy efficiency and innovative services. Therefore retail price regulation is likely to hold back the modernisation process.

The existence of price regulation and other forms of public intervention (taxation, energy policy) are likely to explain the difficulty of assessing the impact of market structure on price evolution. ECB (2010) has assessed the impact of the liberalisation on energy prices for 16 countries over 16 years (1991-2007). According to the results, competition and regulatory variables play a statistically significant role on prices in both electricity and gas markets¹⁵².

3.5. THE REGULATOR AND THE ENFORCEMENT OF THE EX-ANTE REGULATORY FRAMEWORK

Regulatory institutions need to adapt to meet the new challenges posed by the reform of energy markets. Regulatory procedures must be transparent and competitively neutral in order to sustain a level playing field for competition.

¹⁵¹ De Suzzoni (2009).

¹⁵² The authors are however cautious on the magnitude and highlight the difficulties in interpreting the results.

The Third Package puts the emphasis on the independence of the regulator. The regulator should not be submitted to any political authority, and should have sufficient financial means and adequate staffing. The on-going transposition of the Third Package in the Member States should result in measures strengthening the independence of the regulator. At this stage, it is too early to make an assessment of the situation as most Member States are in the process of notifying the transposed Energy laws.

4. CONCLUSION

The summary table (table II.3) below provides an assessment of the overall competitive situation in the generation/production and end-user markets, and the processes of unbundling and interconnection in Member States¹⁵³.

The reading of the table can be made at two levels – Member States and market segments across Member States.

First, **competition in individual Member States is still heterogeneous, which means that the full enforcement of EU legislation is not yet achieved.** Moreover, the combination of public ownership with high market shares, low cross border interconnection and price regulation could be seen as potential market malfunctioning in a Member State. This is particularly the case in Estonia, Greece, Slovakia, Malta in the electricity market; and it is also the case in Bulgaria, Estonia, Poland, Slovakia in the gas market.

Second, **market functioning in some individual energy segments across Member States could require further scrutiny.** When looking across the different market segments (generation/production, infrastructure, retail), insufficient interconnection seems to be common to Member States in the electricity and gas sectors. Arguably, many projects are on-going at the EU level, and cross-border interconnection has been identified as one of the main priorities of the EU agenda.

High concentration in the electricity and gas retail markets also seems to be a common factor in many Member States; this would deserve monitoring as it is the final link between upstream markets and customers. Finally, public ownership, in particular in the gas sector, is a common feature which could require further examination. Once again, public ownership should not be seen as an indicator of underperformance, but rather as a potential vehicle for certain forms of economic patriotism prejudicial to the internal market.

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¹⁵³ At this stage of the analysis, some choices had to be made in order to screen the competitive situation in the energy segments. As regards market structure, the threshold of 80% has been taken for market shares of generators/producers; beyond 80%, it could be assumed that competition is insufficient. In the case of retailers, as the indicator provides the cumulative market share of the main retailers, the threshold of 80% has been combined with a maximum of 3 retailers: beyond a cumulative market share of 80% and a maximum of 3 retailers, it could be assumed that competition is insufficient. As regards state intervention, public ownership (over 50%) and end-user price regulation has been considered. The different models of unbundling have been considered. As regards infrastructure interconnection, the benchmark is the EU weighted average for electricity, and 100% for gas supply (on the basis of the n-1 formula provided in regulation 994/2010).

Table II.3: Summary Table of the Competitive Situation in Member States in Electricity and Gas

ELECTRICITY (2010)								GAS (2010)						
	Generation: share >80%	Public ownership of the first generation producer (> 50%) (*)	Certification for effective unbundling (EU) (**)	Retail: cumulative share >80% (< or = 3 retailers)	Price Regulation NH	Price Regulation HH	Net transfer Capacity as a % of peak load > EU average (***)	Entity bringing gas into the country: share >80%	Public ownership of the first producer/supplier (> 50%)*	Certification for effective unbundling (EU) (**)	Retail: cumulative share >80% (< or = 3 retailers)	Price Regulation NH	Price Regulation HH	Resilience of the gas system (>100%) (***) (****)
AT		51.0	ITO	92.00			53.13		31.50	ITO	70.00			161
BE	79.10	0.0	OU	84.52			28.65	70.00	0.00	OU	95.00			172.34
BG		100.0	ITO	84.60			14.10	97.10	100.00	ITO	94.10			61.3
CY	100.00	100.0		100.00			0.00	No gas market						
CZ	73.00	70.0	OU	87.90			25.99	72.60	0.00	ITO	74.90			288.4
DE	28.40	0.0	OU/ITO	37.30			23.29		0.00	OU/ITO	16.20			180
DK	46.00	76.0	OU				42.86		76.00					115
EE	89.00	100.0	OU	73.00			65.15	100.00	0.00	OU	97.00			60
EL	85.10	100.0	ITO	93.70			16.79	88.6	65.00	ITO/OU	84.70			85
ES	24.00	0.00	OU	72.57			6.98	43.70	0.00	OU	75.00			110
FI	26.60	51.0					27.30	100.00	24.00		95.00			102.4
FR	86.50	84.0	ITO	85.00			12.35	73.00	35.00		78.00			130
HU	42.10	100.0	ITO	78.00			52.19	32.60	22.00	ITO	89.10			105
IE	34.00	95.0	ISO?	97.00			0.00	36.30	96.73	OU	98.40			62
IT	28.00	31.2	OU	55.00			15.49	41.30	30.30	OU	58.40			106.1
LT	35.40	100.0	OU	87.10			142.11	50.50	0.00	OU	98.40			27.4
LU	85.40	25.0		91.40			92.7		25.00		94.00			44.24
LV	88.00	100.0	ISO	99.90			207.46	100.00	0.00		100.00			153.85
MT	100.00	100.0		100.00			0.00	No gas market						
NL		0.0	OU	75.00			26.37		51.00	OU	72.00			162
PL	17.40	62.0		70.32			0.00	96.75	72.00		93.00			98.1
PT	47.20	4.0		97.00			13.91	95.80	8.00		90.70			75
RO	33.60	80.0	ISO	66.81			0.00	48.43	100.00	ISO	87.74			
SE	42.00	100.0	OU	47.90			32.62	52.00	0.00	OU	97.05			12
SI	56.30	100.0		99.00			83.72	94.20	39.00	ITO	87.87			78.3
SK	80.90	34.0	OU	86.42			76.52	77.73	51.00	ITO	95.48			173.48
UK	21.00	0.0	OU	91.50			3.35	23.00	0.00	OU	72.30			113
EU average	34.00			57.18			23.51	43.82			65.51			
Improvement	Above	Above	(**)	Above	Yes	Yes	Below	Above	Above	(***)	Above	Yes	Yes	Below
Median	46.60	-	-	86.42	-	-	25.99	76.00	-	-	89.90	-	-	-
Threshold	80.00	50.00	-	80 and 3 retailers	Yes	Yes	23.51	80.00	50.00	-	80 and 3 retailers	Yes	Yes	100.00

exemption

Ongoing reforms/procedures

High

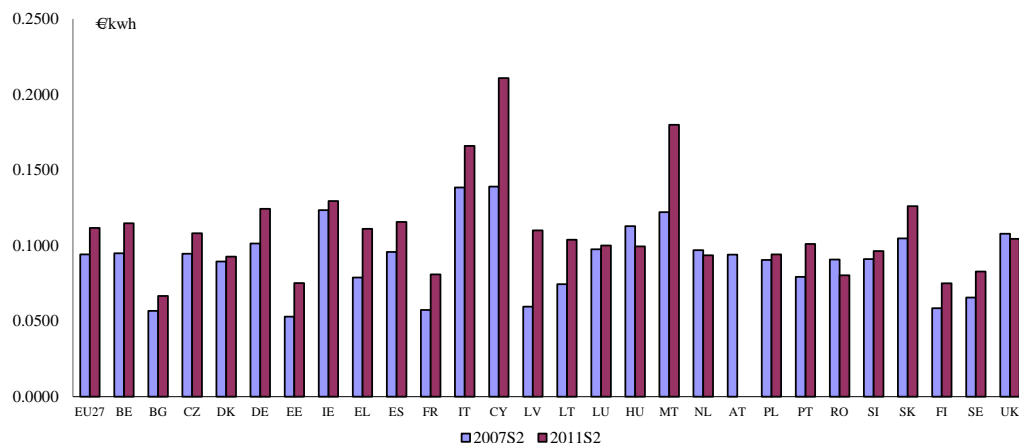
Medium

Low

(*) exclude possible golden shares. (**) ITO: independent transmission operator; ISO: independent system operator, OU: ownership unbundling. In green, certified; in orange, on-going EU procedures, in red, procedures not started. (***) exemptions from certain market opening rules on the basis of article 49 of the Gas Directive 2009/73/EC related to 'emergent and isolated markets' - EE, FI, LV, LT, MT, CY. Exemptions on the basis of article 44 of the Electricity directive 2009/72/EC. (****) Source: DG Energy. Resilience of the gas sector based on article 9 of regulation 994/2010. N-1 formula which describes the ability of the technical capacity of the gas infrastructure to satisfy total gas demand.

5. END-USER PRICES IN ELECTRICITY AND NATURAL GAS

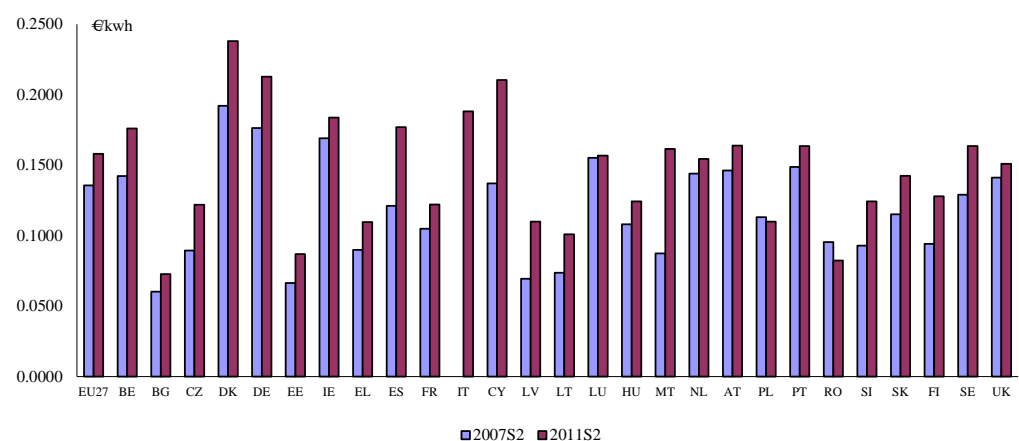
Graph II.8.a – Electricity prices – industrial Customers



Source: Eurostat. Italy: S12008 (S2 2007 not available).

Industrial customers: Band IC 500 MWh<consumption<2 000 MWh

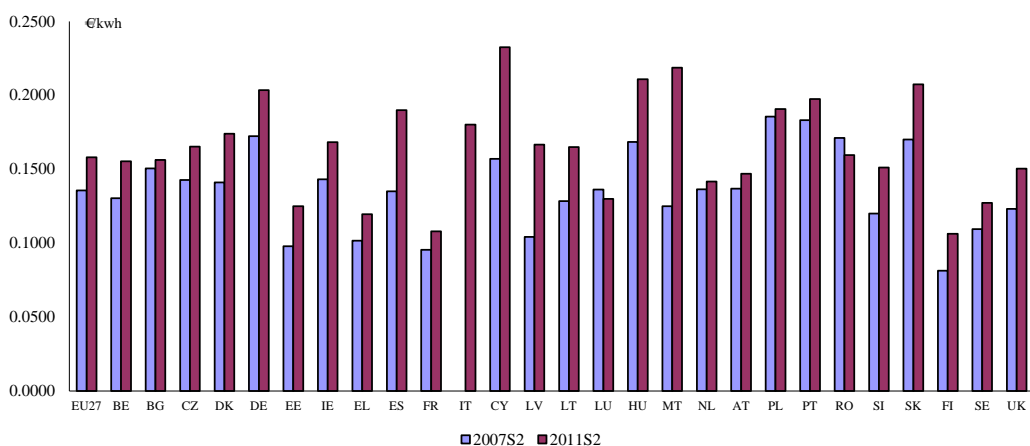
Graph II.8.b – Electricity prices - Households



Source: Eurostat. Italy: S12008 (S2 2007 not available).

Households: Band DC 2 500 kWh<consumption<5 000 kWh

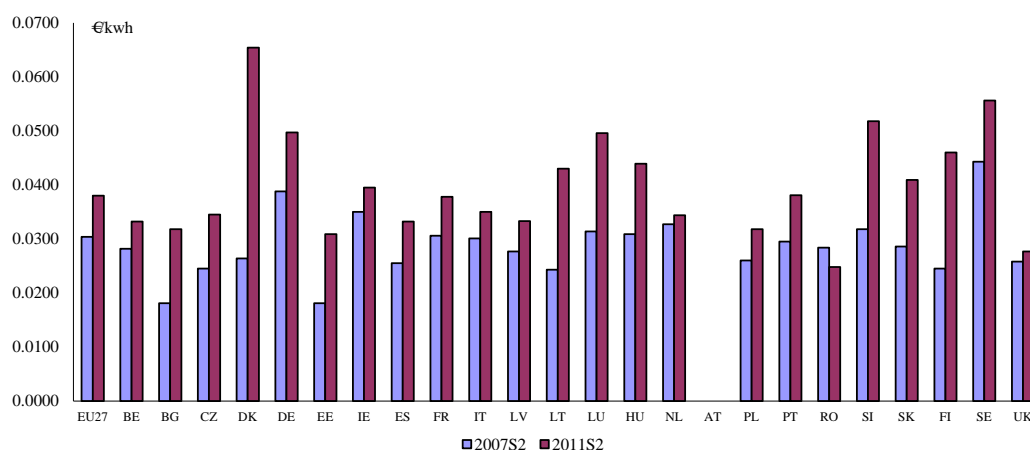
Graph II.8.c – Electricity prices – PPS - Households



Source: Eurostat. Italy: S12008 (S2 2007 not available).

Households: Band DC 2 500 kWh<consumption<5 000 kWh

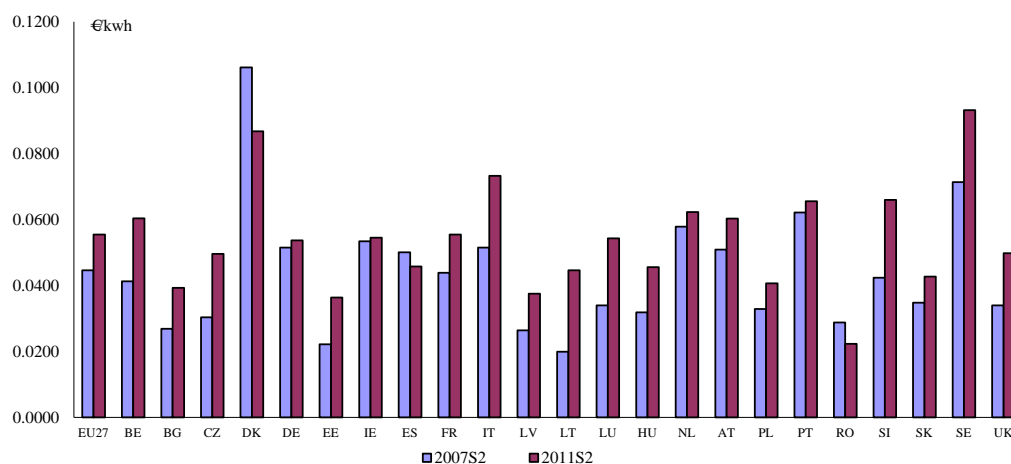
Graph II.9.a – Natural gas prices – industrial Customers



Source: Eurostat

Industrial customers: Band I3 10 000 GJ<consumption<100 000Gj

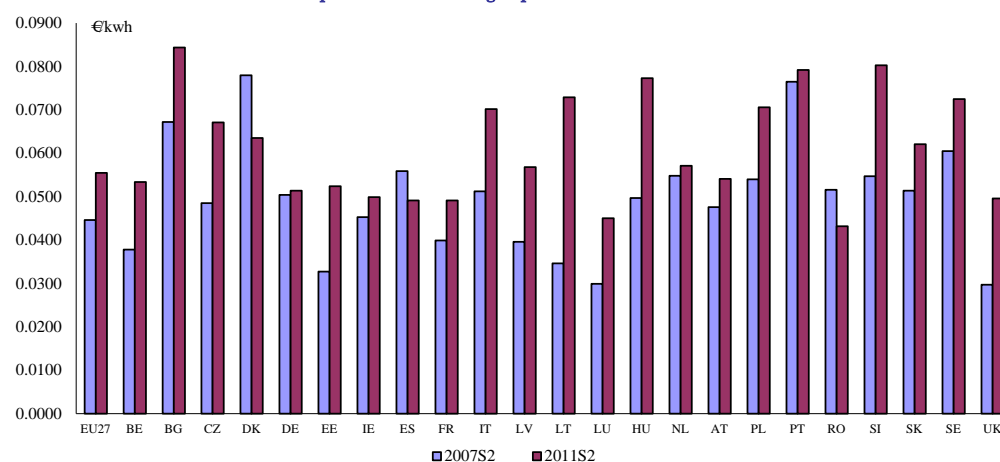
Graph II.9.b – Natural gas prices – Households



Source: Eurostat

Households: Band D2 20 GJ<consumption<200 Gj

Graph II.9.c – Natural gas prices – PPS - Households



Source: Eurostat

Households: Band D2 20 GJ<consumption<200 Gj

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ANNEX III – TRANSPORT

Efficient transport services and adequate transport infrastructure are preconditions for a well-functioning internal market. Efficient transport and logistics are key to the organisation of production, to the integration of markets and to the development of trade. The main objectives of promoting competition in transport are to minimise its costs, to ensure the most efficient use of each mode (co-modality), as well as to ensure a high quality of services. The main direct economic benefits to be expected from these reforms include lower prices and a better contribution to other EU policy agenda. Air transport has been liberalised at an early stage while road transport bottlenecks were progressively removed. In comparison, ports and railways have been sheltered from competition due to either insufficient regulatory requirements or insufficient transposition of directives by Member States.

For a few years, the Commission has been advocating shifting transport activity from road towards railways and shipping¹⁵⁴. This goal is legitimate as railways is a clean transport and can contribute to climate change mitigation and to the reduction of oil dependency. At the same time, ports contribute to the export performance and the competitiveness of the maritime sector. EU ports have the potential for sustaining the economic recovery and contributing to the long term competitiveness of European industries. The well-functioning of these two transport modes is crucial. However, as illustrated by the experiences of programme countries, ports and railways are very often inefficiently operated despite the huge amounts of public money poured into state-owned enterprises. Furthermore, in spite of the modal shift policies of the past decades, railways and inland waterways have failed to increase their modal shares in most Member States. Inland transport continues to be dominated by road transport, while air transport has experienced a significant rise in its market share in the passenger transport segment.

In this annex, the competition assessment will be provided for each transport mode, taking account of the heterogeneous availability of data.

¹⁵⁴ Specifically, a shift of 30% of road freight carried over 300km to rail or waterborne transport by 2030 (and more than 50% by 2050) is among the ten goals for a competitive and resource-efficient transport system, listed in the White Paper on Transport, COM(2011)144 final.

1. INTRODUCTION: ASSESSING COMPETITION IN TRANSPORT

The transport sector still has a number of barriers to market entry and the level of market opening is different across transport modes – road, railways, maritime, and air. This latter feature is explained by different paces of implementation, and also different levels of EU requirements in each mode (road and air being the modes where EU internal market legislation is the most advanced). For this reason, the level of competition will be assessed separately in each transport mode¹⁵⁵.

2. RAIL TRANSPORT

The railways sector has been declining over the past decades. The development of road transport and the increased flexibility of the economy (industrial organisation with lean production models, increased flexibility in the work life) have accelerated the decline of the share of this mode of transport in most Member States.

However, given the need to reduce congestion, oil dependency, and greenhouse gas emissions, the development of this mode of transport is very attractive for policy makers. The revitalisation of railways is part of the EU agenda and national transport strategies. This requires an overall improvement of the service, which, in turn, can be stimulated by well-functioning markets and greater competition. In this broad context, the liberalisation packages adopted during the last decade aimed to foster competition, improve railway market functioning and generally remove those bottlenecks that prevent the completion of a true internal market for rail services.

Compared to energy, assessing railways market functioning is less straightforward as end user prices are not available. As a starting point, it is proposed here to assess overall traffic performances over the past years. In addition, experiences in programme countries show that insights on the financial situation of railway companies are also a good indicator of bottlenecks in the overall functioning of the market.

2.1. MODAL SHARE AND PERFORMANCE

Since 1996, in EU27, the modal share of passenger railways in inland transport has remained stable at about 6.3% (6.5% in 1996)¹⁵⁶. In the freight segment, the share has declined – 16.2% in 2010 against 20.3% in 1996. During the same period, the share of road transport has been broadly stable in the passenger segment while increasing in the freight segment (see below). In particular, most of the increase in the intra-EU freight transport activity resulting from the enlargement of the EU from 15 to 25 Member States in 2004 was picked up by road further increasing its modal share compared to rail¹⁵⁷.

The EU average masks huge disparities across Member States (see table III.I). The picture is more positive in old Member States where the modal share of railways has increased both in passenger and freight (Austria, Germany, Denmark, the United Kingdom, Sweden) between 1996 and 2010. In Spain and France, the share in passenger has increased between 1996 and 2010 while the share in freight has declined over the same period. In new Member States, the modal share of railways has decreased in both segments, more sharply in the freight segment. Overall, new Member States have stabilised recently (excluding the impact of the economic crisis).

¹⁵⁵ Available indicators are heterogeneous across transport modes. Compared to energy, information on end user prices is not systematically available at the EU level, which makes cross country comparison difficult and the assessment of competition focused on market structure. Some empirical studies have been carried out. For example, Szimbaa and al (2007) analyse the heterogeneity of rail tariffs based on a data collection carried out in the context of their study.

¹⁵⁶ Data on EU27 modal share are from DG MOVE Pocketbook 2012.

¹⁵⁷ From 2004 to 2005 alone there was a 0.3 percentage point increase in the modal share of road and the same percentage point decrease in the modal share of rail.

In 2010, the modal share of passenger railway is particularly low for Estonia, Greece, Ireland, Lithuania and Slovenia (below 3%); and in the freight segment, the modal share is particularly low for Spain, Greece, Ireland, Luxemburg (below 3%).

Table III.1 displays the evolution of traffic over the period 1996-2010. In terms of traffic performances, Austria, Germany, Denmark, the Netherlands, Sweden, Slovenia, and the United Kingdom have displayed positive annual growth rates, both in freight and passenger rail (see table III.1). Note that freight traffic has been positive in Estonia, Hungary, Lithuania and Latvia, even though the modal share has sharply decreased, reflecting a possible restructuring process and/or a development of international traffic to and from Russia. By contrast, both passenger and freight railway traffic have displayed negative annual growth over the two past decades in Bulgaria, Czech Republic, Poland, Romania and Slovakia.

Very often, the railway network has been built and developed over the XIXth and XXth centuries. In most countries, the sharp decline in traffic observed from the mid-nineties has not been followed by a sharp reduction of lines, which might have led to an over-sized railway network in some countries (Bulgaria, Czech Republic, Romania, Slovakia).

Table III.1 – Railways Performance

	Evolution of tkm	Evolution of pkm	Evolution of infrastructure lines	Modal share of freight transport		Modal share of passenger transport	
	<i>average growth rate %</i>	<i>average growth rate %</i>	<i>average growth rate %</i>	<i>% in total inland freight tkm</i>		<i>% in total inland pkm</i>	
	<i>1996-2010</i>	<i>1996-2010</i>	<i>1996-2010</i>	<i>1996**</i>	<i>2010</i>	<i>1996**</i>	<i>2010</i>
AT	3.03	0.56	-0.76	30.8	39.0	11.9	11.2
BE	-0.59	3.39	0.42	13.2	12.5	5.7	7.0
BG	-5.97	-4.77	-0.29	45.2	10.7	12.6	3.7
CY	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
CZ	-3.02	-0.94	0.03	42.4	21.0	9.8	7.6
DE	3.09	2.02	-1.40	19.0	22.2	7.5	8.0
DK	1.48	1.78	-0.51	7.7	13.0	7.8	8.6
EE	4.70	-2.43	-1.51	68.9	54.2	2.7	2.1
ES	-0.59	4.59	0.25	9.8	4.2	4.9	5.4
FI	0.41	2.57	0.69	26.0	24.8	5.3	5.2
FR	-2.83	4.00	0.05	21.0	13.5	8.0	9.9
GR	6.80	-0.44	-0.43	2.2	2.0	2.5	1.2
HU*	0.81	-0.53	0.00	32.7	19.6	11.8	11.8
IE	-10.49	1.98	-0.12	8.3	0.8	3.3	2.9
IT	-0.63	1.44	0.41	10.8	9.6	5.9	5.5
LT	4.90	-6.90	-0.77	65.9	40.9	3.2	0.7
LU	-5.41	1.60	0.00	13.0	2.7	5.0	4.4
LV	4.39	-3.33	-1.49	84.9	61.9	4.8	4.8
MT	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
NL	4.98	-0.18	0.35	2.9	4.9	8.5	9.7
PL	-1.91	-2.22	-1.26	54.0	19.4	11.3	5.2
PT	1.26	-0.15	-0.02	7.4	6.1	6.3	4.1
RO	-1.33	-7.74	-0.36	50.7	23.5	24.9	5.9
SE*	1.52	5.08	0.14	36.1	39.3	6.8	9.4
SI	1.23	2.30	0.15	28.3	17.7	2.7	2.5
SK	-2.94	-3.72	-0.08	40.8	22.0	11.4	6.7
UK	2.78	4.33	-0.35	8.3	11.2	4.6	7.5

Source: calculated from Transport, Statistical Pocketbook 2012 and Eurostat.

tkm: tonne-kilometres; pkm: passenger-kilometres, infrastructure lines: length of lines in use.

* Evolution of pkm in SE: 1996-2009; Evolution of infrastructure, HU: 2000-2010

** Modal share, freight, in BG: 2000; Modal share, passenger, EE, LT, LV: 2000

2.2. RAIL ACTIVITIES

When assessing the railway market, one needs to make a distinction between infrastructure and services (freight and passenger). In general, it is considered that the high sunk costs required to establish a railway network makes it impossible to duplicate (Pietrantonio & Pelkmans, 2004), hence the need to regulate the infrastructure segment as opposed to the freight and passenger service segments which are open to competition.

2.2.1. Infrastructure manager

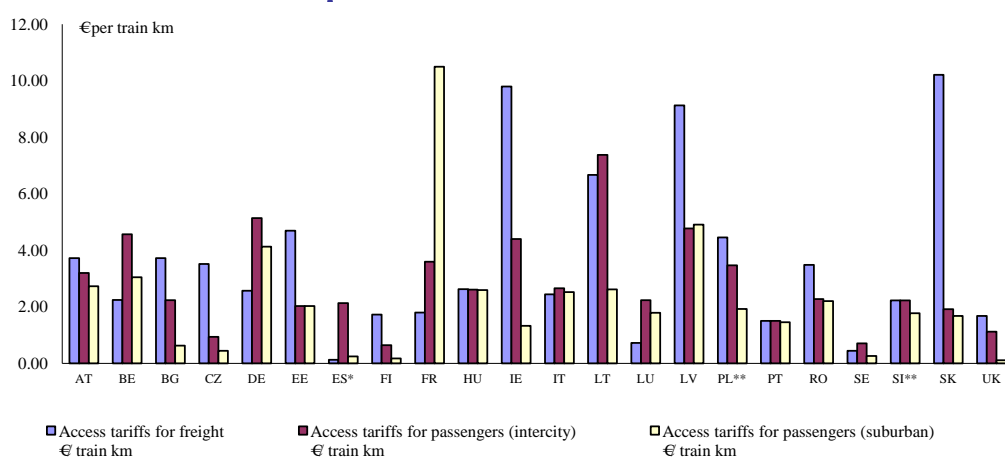
The role of the infrastructure manager is to operate and maintain the network and to set infrastructure access tariffs. For this reason, it has to be fully independent from service operations (freight and passenger) in order to ensure a fair and non-discriminatory access to new entrants.

Several aspects are worth investigating in this context. First, the independence of the infrastructure manager should be reflected in the corporate organisation through unbundling from the service operators. In some countries (Italy, Germany, Austria, Poland), the railway company is organised as a holding company which includes infrastructure, passenger and freight activities. Such an organisation might violate the principle of independence when essential functions are not fully separated or entrusted to the infrastructure manager. Recently, Italy announced that the new Regulatory Body would examine the possibility of unbundling the infrastructure manager RFI from the holding company, Ferrovie dello Stato. Poland has also indicated that the infrastructure manager could be transferred from the holding company to the State.

Second, traffic management should be performed by the Infrastructure manager in order to ensure non-discrimination (in terms of tariff setting, path allocation and traffic management). However, in some countries, traffic management is still operated by the incumbent railways service operator (Latvia, Lithuania, Luxembourg, Slovenia), which again violates the principle of independence.

Finally, access tariffs¹⁵⁸ should not be set too low, but nor too high as they would be prohibitive for new entrants. On average, access tariffs in new Member States are higher than in the EU15, in particular in freight (5.08 €/train km against 2.4 €/train km in 2010 in freight, 2.66 €/train km against 2.66 €/train km in the passenger intercity segment). In Ireland, Latvia and Slovakia where access tariffs are high, the share of the freight incumbent is 95-100%, which shows that access to new entrants is somehow limited (see Graph III.1). Overall, the average access tariff across Member States is higher in freight than in passenger (in 2010, €3.82 per train km in freight against €2.81 and €2.24 for passenger intercity and suburban). In general, the dispersion is higher for freight and suburban passenger services than for intercity, which could highlight the low market integration in railway freight in terms of access to infrastructure.

Graph III.1: Access infrastructure tariff in 2010



Source: European Commission, Monitoring development of the rail market (2012).

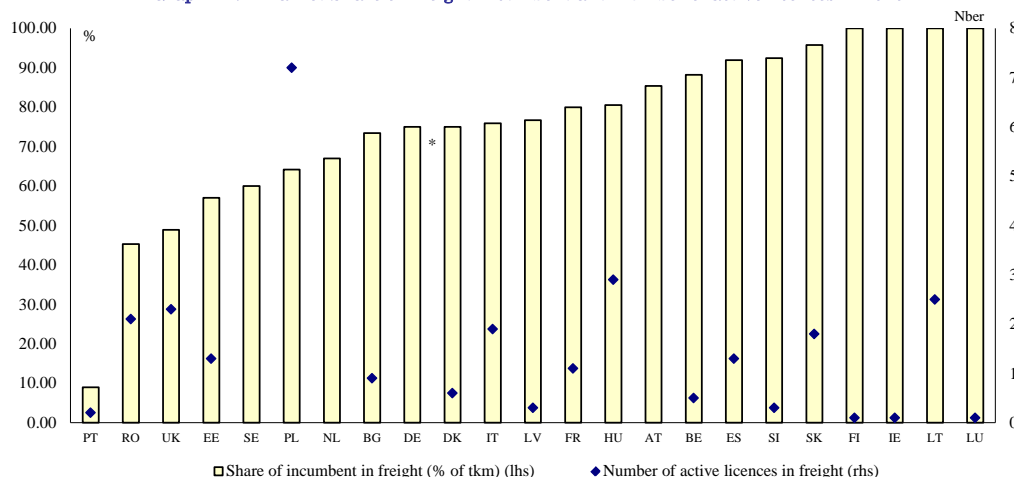
* for passenger intercity, range of tariffs from 0.26 to 7.94 €/train km. ** highest tariffs provided.

158 Pricing in railways is a key issue as the ratio of fixed to marginal cost is high. EU legislation allows infrastructure managers to price access to infrastructure at marginal cost (directive 2001/14/EC).

2.2.2. Freight

The freight segment has been open to competition since 2007. Five years later, the share of the historical incumbent is still high in many Member States. In 3 Member States (Ireland, Lithuania, Luxembourg), it is still 100%. In Austria, Belgium, Spain, France, Hungary, Slovenia, Slovakia, the share is above 80%. In general, these countries also tend to have a lower total number of active licences, as compared to the other Member States (see Graph III.2).

Graph III.2: Market Share of Freight Incumbent and Number of active licences in 2010

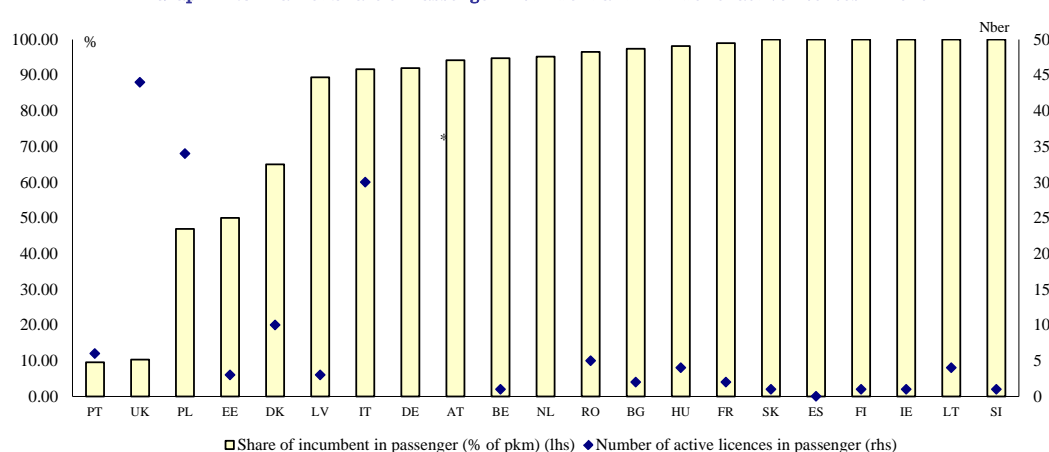


Source: European Commission, Monitoring development of the rail market (2012) and Eurostat. * In Germany, the number of active licences is 340.

2.2.3. Passenger

The passenger segment has been progressively open since 2010. This is why the incumbent share is still high in most countries - above 90 %. Only in Estonia, Poland, the Netherlands and the United Kingdom, do we observe an incumbent share below this figure – ranging between 49% and 65% (see Graph III.3).

Graph III.3: Market Share of Passenger Incumbent and Number of active licences in 2010



Source: European Commission, Monitoring development of the rail market (2012) and Eurostat. * In Germany the number of active licences is 320.

As mentioned in section 3.3.1 – Public Service Obligation, only the United Kingdom, Germany and Sweden award all public contracts based on competitive tendering. The introduction of competitive tendering, in particular if conducted in an efficient manner, could have a significant positive impact on the efficiency of passenger railway operations. As of 2010, 38% of all passenger-kilometres in the EU were performed in closed markets where the incumbents had legal monopolies or exclusive rights that have been directly awarded. A further 26% of passenger-kms were performed in semi-open markets where potential open access operators have to compete with the holders of directly awarded public service contracts (PSCs), often facing additional restrictions related to the preservation of the financial viability of the PSCs. Therefore only 36% of the total

passenger-kilometres in the EU were carried out in open markets that are based either on open access or competitively tendered PSCs. Additionally, the practical arrangements of tendering vary considerably across Member States and the scope and the content of the PSC and the tendering rules have considerable effect on the number of bidders participating in the competitive tenders¹⁵⁹.

2.2.4. Regulatory body

An independent regulatory body has been set up in all Member States that have a rail system. The regulatory model varies across Member States. In Austria, Belgium, Germany, Denmark, Greece, France, Italy, Luxembourg, the Netherlands, and the United Kingdom, the model is a special Regulatory Body. In Bulgaria, Czech Republic, Finland, Hungary, Latvia, Poland, Portugal, Sweden, and Slovakia, the regulatory body is included within a railway authority¹⁶⁰. Finally, in Estonia, Spain, Ireland, Lithuania, Romania, and Slovenia, the regulatory body is within the Transport Ministry¹⁶¹. This latter model is the weakest one in terms of independence and real competencies. Recently, Romania has transferred the regulatory body to the Competition Authority.

The size of the staff working on regulatory issues varies across countries. According to the railway market monitoring¹⁶², Germany has 56 persons dealing with regulatory issues in the rail market, as compared to approximately 100 in the United Kingdom, 10 in Italy and 18 in Poland. The number of staff, its independence and its qualification are an important prerequisite for the effectiveness of the regulator. It also provides an indication of its means – financial and human. Appropriate staffing, independent decision making and enforcement, EU wide cooperation, as well as the concentration of all regulatory functions in a single authority for rail regulation are key factors for success.

2.2.5. Interoperability and safety

It is important to note that specific EU legislation has been created with a view to promoting the technical interoperability of national rail networks in order to overcome historic differences in the field of technical specifications for infrastructure (e.g. gauge widths, electrification standards and safety and signalling systems). EU legislation also sets the framework for a harmonised approach to rail safety in the EU. A dedicated agency, the European Railway Agency (ERA), was established by the Second Railway Package to promote interoperability, harmonise technical standards, and develop a common approach to safety.

While the safety performance of EU railways is good, the continued existence of excessive and non-transparent national technical and safety rules represent unnecessary complexity and excessive administrative costs and create significant market access barriers for potential new entrants. This suggests that further harmonisation of technical and safety rules at the EU level, and enhancements to the role of the ERA, could still have beneficial effects on the market integration process.

2.3. RAIL COMPANIES

Financial data on railway companies are not always available. A study has been carried out in 2009 and has established possible comparisons across companies¹⁶³. Although data are not recent and would need to be updated, some preliminary insights can be identified. In some Member States (Belgium, Greece, Hungary, Italy, Poland, Portugal, Romania, Spain), SOEs are making operating losses and display high indebtedness. In programme countries, some of these companies are experiencing restructuring, which should help them recover some financial viability. Most of the railways companies are still state-owned, even in the competitive segment (freight)¹⁶⁴. Here again, the EU legislation does not require private ownership of freight operators. However, the question of privatisation remains open when such companies are making losses and become a drag on public finances (Italy for example).

¹⁵⁹ European commission, Monitoring development of the rail market (2012).

¹⁶⁰ A railway authority deals with licences, safety and other railway-specific administrative tasks.

¹⁶¹ Rail Liberalisation Index 2011. IMB Global Business Services.

¹⁶² Monitoring development of the rail market (2012).

¹⁶³ RGL Forensics and al (2009).

¹⁶⁴ In the United Kingdom, freight operators are private.

2.4. CONCLUDING REMARKS

Compared to the legislation on energy, the EU legislation on railways is less prescriptive. The market shares of incumbents are still high both in passenger and freight and the independence of the infrastructure management from incumbent undertakings in certain Member States is far from being ensured. In this respect, the recast of the First Railway Package is expected to improve transparency of the rail market access conditions and to strengthen the independence of national rail regulators. Clear unbundling rules foreseen by the legislation (as it is proposed in the Third Energy Package) would reinforce the non-discriminatory access to infrastructure. Open tender procedures for the award of public service obligations would also ensure more transparency about the real cost of public service obligations to the community. This will be addressed in the upcoming Fourth Railway Package. Moreover, the lack of transparency can give rise to over/under compensation. Finally, the involvement of the State in some segments can slow down the market opening process. In addition, it can lead to conflicts of interest when the State finances or regulates some or all railway undertakings. The EU has always been neutral about state ownership, but in the freight segment where there is no public service obligation, the question is state ownership should persist.

3. MARITIME, INCLUDING PORTS

Ports contribute to the export performance and the competitiveness of the maritime sector. Around three quarters of EU trade is transported by sea, which makes their market functioning an issue which goes beyond the sector itself.

However, the functioning of ports and their contribution to the trade performance are heterogeneous across Europe and sometimes reflect national bottlenecks due to restrictive legislation. Overall, there is a concern that the EU port sector as a whole is not sufficiently competitive to cope with the expected growth of transport demand in the maritime sector. There is a further risk that the quality of port services does not keep pace with the evolving needs of port users in terms of availability, reliability, flexibility, speed, security and sustainability.

One difficulty in conducting an assessment of ports is the absence of sufficient indicators and quantitative data which makes a cross-country comparison more difficult.

3.1. EVOLUTION OF SEA ACTIVITIES

3.1.1. The changing nature of port activities

The port sector has radically changed compared to how it used to function historically. In the past, competition between ports was minimal as port related costs were relatively insignificant as compared to the high cost of sea transport. Consequently, there used to be little incentive for port operators to improve their efficiency. However, most ports today are in competition with other ports and other transport options on an international scale. Also the huge productivity gains achieved in ocean transport over the recent decades due to technological change and, in particular, increases in ship size mean that ports are now perceived to be the last controllable cost to be reduced in the maritime logistics chain. This has generated the drive to improve port efficiency, lower cargo handling costs and better integrate ports with the rest of the globalised distribution network.

Given the importance of ports for export competitiveness, there is a strong public interest in ensuring that ports operate efficiently and provide cost-effective, competitive, flexible and high quality services tailored to the requirements of port users. Shippers expect that key ports should operate 24 hours a day, 7 days a week, including the provision of all core, administrative and value added services. Value added services including general logistics services and activities like repackaging, customising, assembly etc. are growing in importance, and ports are in a privileged position to participate in this development. Equally important is their ability to expand the use of information technology, to better serve ports users' requirements and reduce the administrative burden.

Increasing international trade volumes, coupled with the adoption of standardised containers to move cargo, have fundamentally changed the shipping industry. In the last two decades, the so-called hub and spoke system in liner services has developed, as larger containerships have been adopted on major sea transport routes. These large ships mainly call at transshipment hubs where containers are shifted to smaller ships serving regional routes (or other modes of transport). The development of the hub and spoke network has increased competition between ports to offer hub services. To be successful in hub port competition, ports must focus on achieving cost reductions for shippers and providing value added services around port facilities. Dedicated logistics zones in the immediate vicinity of ports, facilitating the smooth intermodal transfer of goods, increase the attractiveness of ports for liner services. Ports are introducing special incentives for shippers to promote transshipments.

The public interest in ports used to be typically represented by public port authorities which directly provided all the basic port services. Under national port reforms undertaken in some Member States, many ports have been transformed into so-called landlord ports where facilities are leased to private operators. The means to improve the efficiency of port operations is to increase the level of competition in the port sector. This can be in the form of inter-port competition, where two or more ports are competing for the same trade, or intra-port competition, where two or more service providers compete within the same port. The level of competition in the port sector can be assessed based on the number of transport options available to shippers and how the costs of the different transport options compare to one another, on the operational performance of the port, on tariff comparisons and on the financial performance of the ports in question.

Unfortunately such performance indicators are not currently available in the public domain, partly due to the confidential nature of the business information (see below).

3.1.2. Maritime transport in the EU

The shipping industry is very much globalized. International law requires that every merchant ship be registered in a country. However, in terms of tonnage, more than 68% of the world's merchant fleet is registered under a foreign flag¹⁶⁵ (and is therefore not registered in the country of domicile of the ship owner)¹⁶⁶. The foreign flag registration is prominent in all leading shipping nations.

The three largest flags of registration (Panama, Liberia and the Marshall Islands) are not host to any significant national ship-owning interests; they mainly provide their flag to vessels owned by nationals of other countries. In 2011 these three countries together accounted for more than 40% of the world fleet in terms of capacity expressed in dwt¹⁶⁷. EU ship-owners are also significant users of foreign registries. For example, 33% of the capacity registered in Liberia is owned by German interests, while Greek interests account for some 20%. In the Marshall Islands, the respective shares are 11% for German interests and 28% for Greek interests¹⁶⁸.

Some EU Member States, namely Greece, Malta and Cyprus, are also included among the top ten flags of registration worldwide (graphs III.4.a, III.4.b, III.4.c). However, over 90% of the shipping capacity registered in Greece had Greek owners, while Maltese and Cypriot ship owners only accounted for a small share of the shipping capacity registered in their respective countries (12.5% for Cyprus and much less for Malta)¹⁶⁹.

In terms of the nationality of the controlling interests of vessels, the Greek owned merchant fleet remains the biggest in the world in terms of capacity, representing some 16% of the world's total shipping capacity. At the beginning of 2011 the Greek owned merchant fleet represented over 202 million dwt of shipping capacity out of which only some 64 million dwt was registered in Greece. Greece was closely followed by Japan and Germany, with German owned vessels representing over 114 million dwt of shipping capacity¹⁷⁰. The difference between the nationality of the owners and the flag of registration of the vessels was even more striking in the case of Germany with only 17 million dwt of capacity (less than 15% of the total German owned shipping capacity) flying the German flag.

¹⁶⁵ United Nations Conference on Trade and Development (2011).

¹⁶⁶ This practice is also described using the term "flag of convenience" Ships are typically registered under flags of convenience to reduce operating costs or avoid the regulations of the owner's country.

¹⁶⁷ Deadweight tonnage (dwt) is the measure of how much total weight a ship can carry. It is the sum of the weights of the cargo, fuel, ballast water, crew etc.

¹⁶⁸ United Nations Conference on Trade and Development (2011).

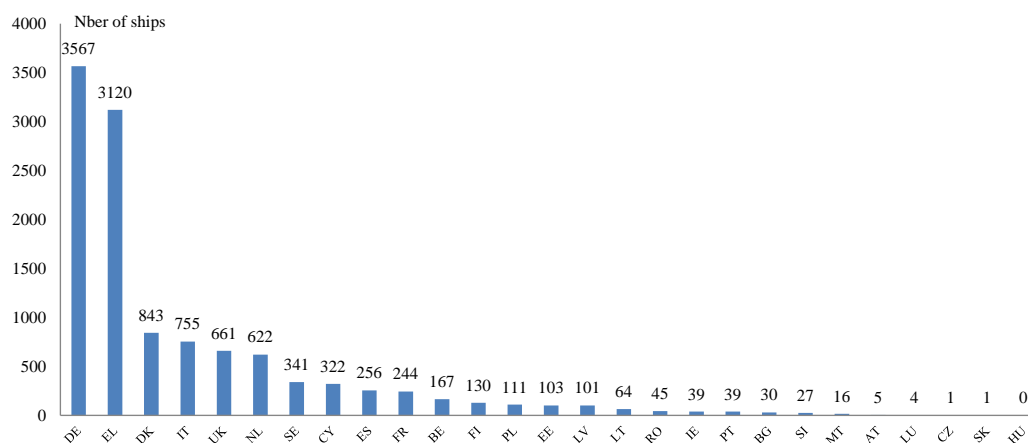
¹⁶⁹ United Nations Conference on Trade and Development (2011).

¹⁷⁰ United Nations Conference on Trade and Development (2011). The charts include seagoing propelled merchant ships of 1000 gross tons and above).

While at the beginning of 2011 EU-27 Member States controlled 460 million dwt of shipping capacity, equal to 37.6 % of the world's merchant fleet, the share of the total EU fleet sailing under a foreign flag was 69.1%¹⁷¹.

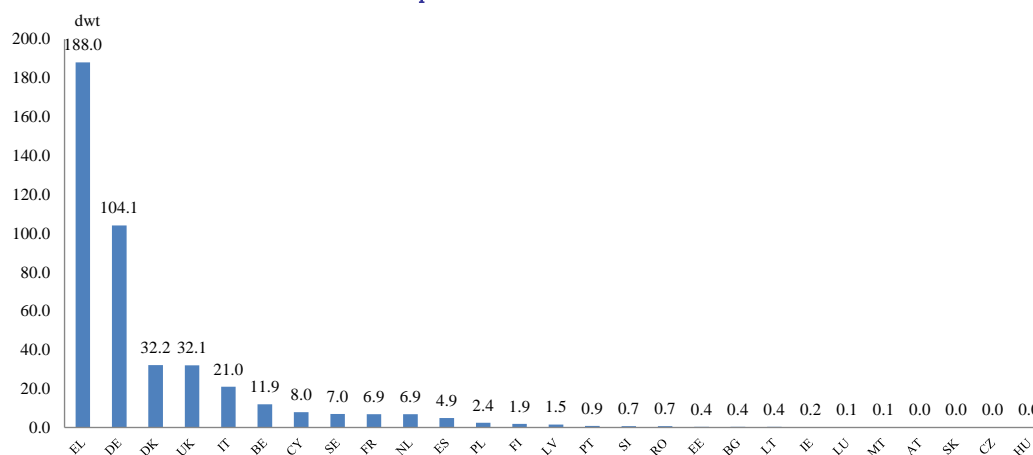
On 1 January 2010 the fleet flying the flags of EU Member States comprised of 3509 vessels representing a total capacity of some 432 million dead weight tonnage (DWT). This represented 20% of the world merchant fleet in terms of ship numbers, and almost 25% in terms of capacity. However, the total fleet controlled by EU companies is much larger once the vessels that are registered in third countries are taken into consideration.

Graph III.4.a: EU merchant fleet*



Source: Transport, Statistical Pocketbook 2012. *number of ships in total fleet controlled, only ships of 1000 grt and above (grt: gross registered tonnes).

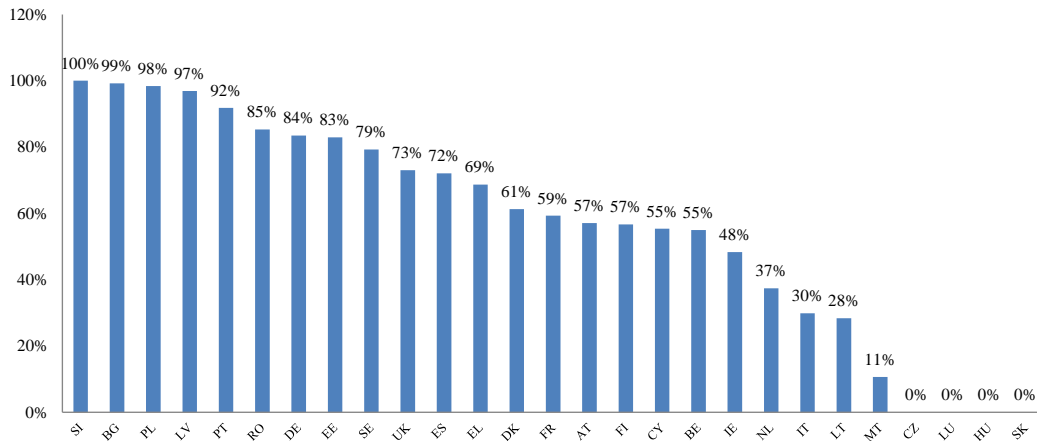
Graph III.4.b: EU merchant fleet*



Source: Transport, Statistical Pocketbook 2012. * dwt capacity of total fleet controlled, only ships of 1000 grt and above.

¹⁷¹ Institute of Shipping Economics and Logistics (2011).

Graph III.4.c: Share of foreign flag in total merchant fleet*



Source: Transport, Statistical Pocketbook 2012. *based on dwt, only ships of 1000 grt and above.

The composition of the world merchant fleet reflects the requirements for the seaborne transport of different goods, including dry and liquid bulk and manufactured goods. In January 2011, there were more than 103,000 seagoing merchant ships in service globally, with a combined tonnage of 1,396 million dwt. Oil tankers accounted for 475 million dwt (34%) and dry bulk carriers for 532 million dwt (38%). As manufactured goods are increasingly containerised, the share of the containership fleet as a share of the world fleet increased from 1.6% in 1980 to 13% in 2011¹⁷². The share of the general cargo fleet was 8% in 2011. In complement to these global averages, the table below shows the share of total EU-27 operators' shipping capacity as a percentage of the total global shipping capacity for each of the main cargo types in 2010, and provides a percentage point breakdown of total EU-27 capacity by Member State.

Table III.2: Share of capacity by cargo type and by owner

Oil Tanker	Chemical Tanker	LPG Tanker	LNG Tanker	Dry Bulk	General Cargo	Container	Vehicle
EU27 35%	EU27 46%	EU27 30%	EU27 27%	EU27 31%	EU27 25%	EU27 38%	EU27 19%
EL 16%	DK 13%	EL 9%	UK 13%	EL 17%	DE 8%	DK 14%	SE 11%
UK 10%	EL 11%	UK 6%	EL 3%	UK 3%	NL 4%	DE 14%	IT 4%
DK 3%	IT 6%	DK 5%	BE 3%	DE 3%	EL 2%	FR 7%	Other EU 4%
Other EU 6%	CY 2%	BE 5%	Other EU 5%	IT 2%	UK 2%	Other EU 3%	
	DE 2%	Other EU 5%		Other EU 6%	IT 1%		
	SE 2%				CY 1%		
	NL 2%				NL 1%		
	Other EU 2%				Other EU 5%		

Source: HIS Fairplay (2010)

3.1.3. Maritime transport and port activities

The coastline of Europe stretches for about 100,000 kilometres and it is dotted by more than 1200 merchant ports. On a tonnage bases about three quarters of the EU's international trade is transported by sea and passes through these ports. Around 76,8% of the EU's exported goods and 71,3% of its imported goods were carried by sea in 2009. As for intra-EU and domestic transport (short-sea shipping), maritime transport accounted for an estimated 36,9% on a tonne-kilometre basis in 2010¹⁷³.

Overall, throughput at EU ports over the period 2002-2010 had increased until the crisis hit in 2009 (Graph III.5.a.). In terms of the total gross weight of goods handled, the ports of the United Kingdom, the Netherlands, Italy and Spain are among the most important (Graphs III.5.b). Dutch ports had the biggest throughput, accounting for 15% of the total tonnage of goods handled at EU ports, followed by those of the United Kingdom (14,1%) and Italy (13,6%) in 2010.

As for individual ports, Rotterdam, Antwerpen and Hamburg were the three biggest in 2010, both in terms of tonnage and the number of containers handled. It is interesting to note that the 20 largest ports accounted for

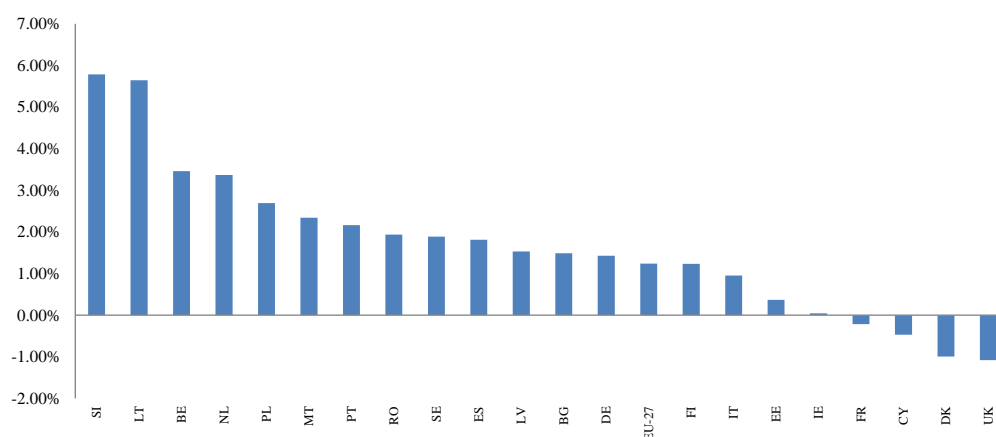
¹⁷² United Nations Conference on Trade and Development (2011).

¹⁷³ This chart is an estimate published in the EU transport in charts Statistical Pocketbook, 2012. Unfortunately, modal share of maritime transport at a Member State level cannot be calculated based on official Eurostat statistics as no tonne-kilometre performance is reported for maritime transport. The Eurostat statistics are based on the weight of seaborne goods handled in the European ports

39% of the total port throughput in the EU, with the biggest one, Rotterdam, alone representing more than 10%. In most of the top EU ports, business was dominated by inward traffic.¹⁷⁴

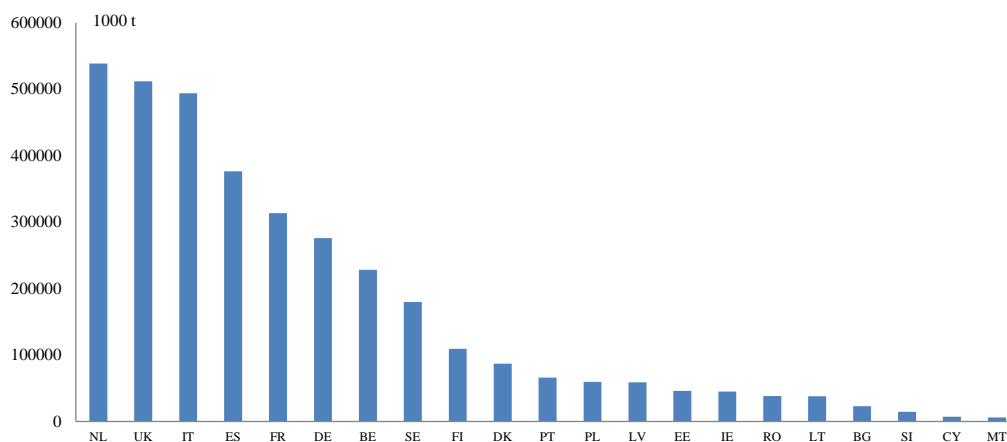
It is interesting to note that 10 out of the top 20 EU ports are located on the North Sea coast while 5 are in the Mediterranean. The dominance of ports in the Le Havre-Hamburg range continues for the time being despite the increasing degree of participation by mainland Med ports in international shipping networks¹⁷⁵. The joint market share of the Le Havre-Hamburg range ports in liner services (container traffic) between the Far East and Europe was estimated at 76%, compared to 24% for western Med ports¹⁷⁶.

Graph III.5.a: Gross weight of goods handled in all ports – growth rate 2002-2010



Source: Eurostat.

Graph III.5.b: Gross weight of goods handled in all ports in 2010



Source: Eurostat.

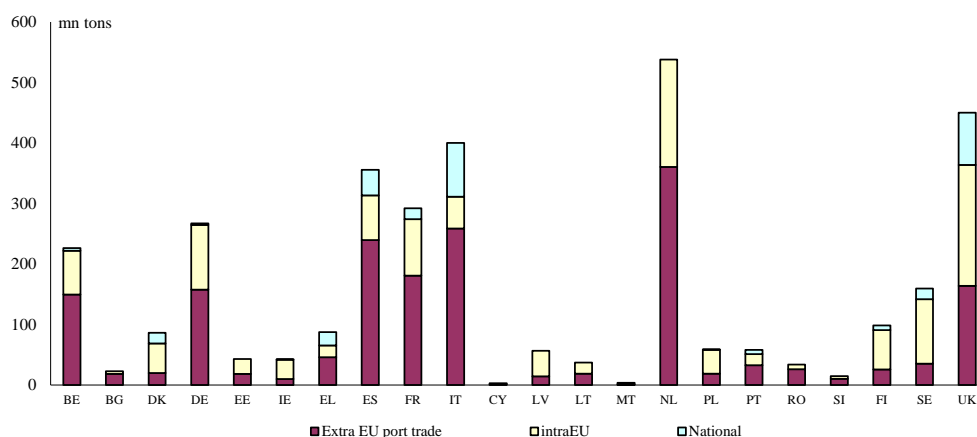
In 2010, on average, 63% of transport by sea in the main EU ports was extra-EU trade, 25% was intra-EU, and 11% was national trade (Graph III.5.c). The significance of domestic shipping is much greater for countries with long shorelines while certain countries (such as for example the Netherlands, Belgium and Spain) have a high share of extra-EU international shipping based on their geographical position (and the competitiveness of their transport sector in general and their port sector in particular).

¹⁷⁴ Eurostat, Statistics in focus 12/2012

¹⁷⁵ Notteboom (2009).

¹⁷⁶ Mila quoted by Notteboom (2009).

Graph III.5.c: Seaborne transport of goods between main ports – 2010 *



Source: Eurostat. Total Gross weight of goods.

3.1.4. Port performance

There is a lack of comprehensive and reliable indicators and data for the measurement of the efficiency and quality of ports and ports services. Existing studies are mostly limited to the comparison of the technical parameters and the measurement of the technical efficiency of port operations.

In its Global Competitiveness Reports¹⁷⁷, the World Economic Forum does publish an indicator on the quality of port infrastructure for the countries covered by the report but this assessment is based on the answers given by respondents to a single question ("How would you assess port facilities in your country?") where possible answers range from "1=extremely underdeveloped" to "7=well developed and efficient by international standards". Even though the results of the assessment (where the Netherlands and Belgium are among the top 5 countries worldwide with the best quality of port infrastructure in the 2011-2012 report) seem to confirm the conventional wisdom about which countries offer the best quality ports, the lack of detail in this indicator makes it difficult to identify the differences that make some Member States' ports more efficient than others'.

The European Sea Port Organisation (ESPO) developed a port performance dashboard in the PPRISM project¹⁷⁸ which will provide useful information on the average performance of the ports that decide to participate in the exercise. However, data on individual ports or even ports located in individual countries will not be published for confidentiality reasons.

3.2. CHALLENGES FOR THE EX-ANTE REGULATORY FRAMEWORK AND THE EX-POST COMPETITION ENFORCEMENT

Contrary to airport services, there is no EU legislation directly regulating market access to port services. The Commission's proposal for a Directive was rejected by the European Parliament, and the 2007 Communication on ports policy is based on soft law measures and best practices.

Successful port reform could deliver benefits for the state, port operators, transport operators, shippers and consumers as well. At the macroeconomic level a more efficient port sector improves external trade competitiveness by reducing overall transport cost through the reduction of the cost of port services. In addition, the burden on national budgets would ease if port investments and operating costs could be financed by the private sector. Ultimately consumers would also benefit from lower prices of goods.

3.2.1. Scope of activities and public financing

While the nature of port activities has changed over the recent decades, the regulatory framework has remained quite stable. However, with the progressive opening of port services to competition, public funding of ports has

¹⁷⁷ http://www3.weforum.org/docs/WEF_GCR_Report_2011-12.pdf

¹⁷⁸ Port Performance Indicators – Selection and Measurement, see <http://pprism.espo.be/Home.aspx>

started to entail the possibility of state aid to certain operators. Moreover, most of the ports now have activities beyond their landlord function (container, intermodal facilities etc.).

The issue is complicated further by a lack of sufficient transparency regarding the funds that public authorities make available to their ports which can have a distortive effect on inter-port competition and may also represent an undue burden on public finances. State subsidies blur the role of commercial forces and, under the current rules stipulated in Commission Directive 2006/111/EC, a large number of publicly owned ports (those under an annual turnover of less than €40 million) do not even have to keep separate accounts for the activities that receive public financing and those that do not¹⁷⁹. Additionally, there is also often a lack of transparency about how port charges are calculated, as different ports apply different structures and systems.

3.2.2. Intermodal activities

The connections between seaports and their hinterlands represent a particular challenge, as these connections play an increasingly important role in shippers' decisions in shaping their supply chains. The development of intermodal corridors, using rail and barge services, allow for a more sustainable hinterland penetration of ports compared to road transport solutions.

The availability of attractively priced intermodal transport solution serves as a competitive advantage for ports and the successful promotion of intermodal corridors is highly relevant to any policies aimed at generating a modal shift from road haulage to other transport modes. The mere existence of multimodal transport options is not sufficient as shippers base their decisions also on the reliability, capacity, frequency and costs of inland transport services by truck, rail and barge. As explained by Notteboom (2009), European ports are increasingly competing not as individual places that handle ships but as crucial links within increasingly global supply chains. As a result, port choice becomes more a function of network costs and ports are chosen on the basis of the optimisation of the total supply chain costs (sea, port and inland costs, including inventory costs for shippers).

Notteboom (2009) also observes that the growing concerns on capacity shortages in ports and inland infrastructure have made supply chain managers base their port and modal choice decisions increasingly on reliability and capacity considerations rather than on pure cost considerations. With a view to reducing the risk of potential major disruptions, logistics players tend to opt for a flexible network design that offers various routing alternatives. Consequently, seaports on inefficient or capacity constrained corridors are in an increasingly disadvantaged position. These market developments represent a market driven interest in the development of co-modality from the users and suppliers of intermodal services.

3.2.3. The scope of reforms

Therefore the current restrictions on the provision of port services should be reviewed with a view to enhancing the efficiency of cargo handling and technical/nautical services. In addition, full transparency regarding the public funding of the different port activities should be established in the framework of EU legislation, in order to avoiding any distortion of competition. Indeed, both these initiatives appear among the foreseen Commission initiatives accompanying the 2011 White Paper on transport. This could be done in conjunction with the identification of the scope of state aid¹⁸⁰. In its October 2011 proposal for the revision of the TEN-T guidelines¹⁸¹, the Commission proposed that the maritime ports that will be part of the TEN-T network are connected with the railway lines of the network and that they offer at least one terminal open to all operators in a non-discriminatory way while applying transparent charges. However, the next round of the future revision of the TEN-T guidelines could go one step further and EU funding of port improvements at key ports and their inclusion in the TEN-T network could be made conditional also on the fulfilment of certain minimum levels of service provision, e.g. the availability of port services 24 hours a day, 7 days a week. In addition, EU funding could focus even more on intermodal services that are fundamental to the competitive advantage of ports.

¹⁷⁹ The directive requires transparency in the financial relations between public authorities and public undertakings, in particular regarding the provision of capital, loans or non-refundable grants, the compensation for financial burden imposed by the public authorities among other things. The transparency will be ensured through the publication of separate accounts. According to article 5, such rules do not apply to public undertakings which turnover is less than €80 mn.

¹⁸⁰ The issue of state aid could require the identification of different types of seaports infrastructure with public general infrastructure and user specific infrastructure. This also raises the issue of treating port operators as economic operations, i.e. undertakings.

¹⁸¹ COM(2011)650.

3.3. CONCLUDING REMARKS

Due to the fact that more than three-quarters of total EU exports leave the EU through one of its ports, the quality and the efficiency of the ports sector has a direct impact on the competitiveness of EU exports. In addition, while the port sector as a whole enjoys a kind of captive market for a huge share of exports destined for outside the EU, the short-sea shipping sector is competing heavily with other modes of transport, especially road transport for shipments within the EU. When shippers decide on which mode of transport to use, the associated costs and service levels of the ports are key factors in the decision-making process.

During the last decade a series of European Commission proposals have aimed to assist and promote the adjustment of European ports to these challenges. The objective would be to increase competition both within and between ports. Similar initiatives have already delivered EU legislation in the air transport sector and, together with a system of performance measurement, it is considered that such EU legislation could positively contribute to the improvement of the European ports sector.

4. ROAD FREIGHT TRANSPORT

Road transport in freight and passenger is the most important transport mode across Member States. Its good performance can be explained by favourable economic developments (flexibility required by new industrial organisation, atomistic structure of the sector with fierce competition) as well as the quite advanced liberalisation process (see section 3 – Regulatory Framework of Network Industries). This section will focus on freight transport, as the passenger traffic is dominated by passenger cars which do not have any specific transport policy-related regulatory barriers to mobility¹⁸².

4.1. MODAL SHARE AND PERFORMANCE

In 2010, EU27 road freight transport accounted for almost 74% of all inland freight transport; a share almost four times that of the second biggest mode, rail (16%)¹⁸³. The modal share of road freight transport has been consistently increasing over time as it was 67% in 1996 and 70% in 2000. The trend of the increasing dominance of road freight transport goes back even longer in the EU. In 1970 the tonne-km performance of road freight was only about 50% more than that of rail in the countries that became the EU-15¹⁸⁴. However, the sharp increase in freight transport activity since then has been captured almost exclusively by road freight transport, which has been growing both in absolute terms and in relative terms compared to other freight transport modes.

The Single European Market has facilitated industrial strategies involving greater geographical separation between industrial activities, the creation of cross-border alliances, and the introduction of lean production and just-in-time strategies. This in turn has reduced stock levels and created a demand for fast, flexible, reliable and high quality freight services operating over extensive delivery networks where delivery lot sizes are smaller and delivery frequencies higher. The road freight transport sector has been particularly well placed to fulfil these requirements, as other modes of transport were not able to provide the type or volume of transport services demanded due to their capacity and flexibility constraints. Road transport has met the challenge through a combination of growth and changes in operating practices that have raised quality and improved productivity.

¹⁸² After passenger cars the second most significant mode of passenger transport in the EU is bus and coach that accounted on average for 8.8% of passenger-kms in the EU in 2009 (this is higher than the modal share of rail). Behind the EU average there are very significant variations across the individual Member States as the modal share of bus and coach ranges from 4.9% to 24.4 (2009 data). While international transport by bus and coach is liberalised in the EU, there is no EU legislation regulating domestic transport. Consequently, there are significant differences in the regulatory arrangements applying to bus transport in the different Member states. The arrangements range from fully liberalised with no restrictions on the operation of new services (apart from meeting basic requirements, for example regarding the safety of vehicles) to closed markets with state owned incumbents having monopolies or even the prohibition of the operation of long distance bus services, particularly where these would compete with rail services. In many Member States there is competition for the market through the bidding process for concessions that are renewed periodically (which in itself might represent an indirect barrier to entry if the award of the concessions is designed in a way that favours incumbents).

¹⁸³ The remaining two inland freight transport modes, inland waterways and pipelines had a modal share of about 5% each.

¹⁸⁴ ECMT (2004).

Table III.3: Modal share* and performance of road transport

	Evolution of tkm	Evolution of pkm	Evolution of infrastructure length	Modal share of freight transport		Modal share of passenger transport	
	<i>average growth rate %</i>	<i>average growth rate %</i>	<i>average growth rate %</i>	<i>% in total inland freight tkm</i>		<i>% in total inland pkm</i>	
	<i>1996-2010</i>	<i>1996-2010</i>	<i>1996-2009</i>	<i>1996**</i>	<i>2010</i>	<i>1996**</i>	<i>2010</i>
AT	0.75	1.08	0.4	64.3	56.3	10.7	10.6
BE	-1.23	0.71	0.4	76.4	69.5	11.2	13.6
BG	9.50	4.33	3.1	52.3	68.1	26.3	17.0
CY	0.15	3.78	3.3	100.0	100.0	22.3	18.4
CZ	3.72	1.11	4.2	57.1	79.0	20.1	18.7
DE	1.94	0.57	1.0	64.3	64.9	7.1	6.1
DK	-2.45	0.36	2.6	92.3	87.0	12.5	9.9
EE	10.55	4.80	3.3	31.1	45.8	27.5	14.5
ES	1.73	5.63	7.4	90.2	95.8	13.8	12.3
FI	5.24	2.11	5.1	73.7	75.0	13.0	9.9
FR	1.40	1.74	4.9	76.4	82.2	5.6	5.8
GR	0.31	1.01	2.2	97.8	98.0	29.6	16.5
HU	6.59	1.01	10.9	61.3	75.1	25.0	25.1
IE	5.74	2.58	18.9	91.7	99.2	13.5	12.8
IT	0.25	0.92	0.2	89.2	90.4	11.7	12.2
LT	10.21	4.63	-1.4	34.1	59.1	14.6	8.2
LU	4.38	2.23	1.7	79.7	93.5	9.8	11.4
LV	14.10	5.62	n.a.	15.1	38.1	18.4	15.3
MT	0.00	1.74	n.a.	100.0	100.0	20.4	18.9
NL	1.03	0.50	1.3	64.2	62.1	5.1	3.9
PL	10.02	6.87	9.4	45.3	80.6	19.4	6.4
PT	0.84	3.20	11.0	92.6	93.9	15.5	10.9
RO	4.52	4.34	9.9	41.4	49.2	17.4	12.9
SE	1.12	0.84	3.0	63.9	60.7	8.5	7.2
SI	11.70	3.08	7.1	71.7	82.3	18.9	10.8
SK	4.38	2.78	5.3	53.8	74.8	33.8	15.5
UK	-0.54	0.39	0.6	91.6	88.7	6.3	5.1

Sources: calculated from Transport, Statistical Pocketbook 2012 and Eurostat.

tkm: tonne-kilometres; pkm: passenger-kilometres, infrastructure: length of motorways.

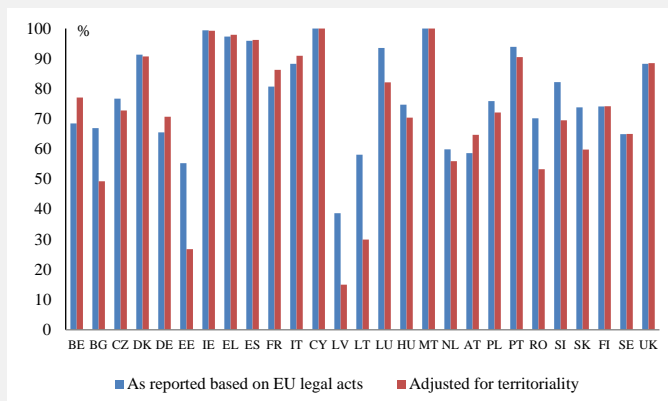
* modal share is percentage of inland freight transport (consisting of road, rail, inland waterways and pipelines). The modal share data is based on the official statistics reported according to the relevant EU legal acts on transport statistics whose methodology is not fully consistent across the different transport modes. See *Box III.1* for data constraints.

** Modal share, freight, in BG: 2000; Modal share, passenger, CY, EE, LT, LV, MT: 2000

BOX III.1: DATA CONSTRAINTS FOR ROAD TRANSPORT

As regards road transport, it is more difficult to calculate modal shares for individual Member States as data is reported by EU Member States in the framework of the relevant statistical legal acts according to the territoriality principle for rail and inland waterways transport but not for road transport.

Graph III.6: Modal share of road in inland freight transport (%) in 2009 *



Source: Eurostat, Statistics in Focus, 13/2012

International road freight transport is reported on the basis of the nationality of the haulier and not on the basis of where the transport is actually performed. What this means is that for road each Member State reports the performance of the hauliers that are registered in that Member State, irrespective of where the transport activity is actually carried out, whereas for rail and inland waterways, it is the level of activity that is carried out in that Member State that is reported irrespective of the nationality of the operator carrying out the transport. To give an example, the road freight transport statistics reported by Poland is the performance of all the hauliers registered in Poland. As Polish hauliers are very active in international road freight transport and by now they are the biggest cross-traders in Europe (they transport goods from one foreign country to another often without even passing through Poland), a lot of the tonne-kilometres performed by Polish hauliers is actually performed not in Poland but abroad. Yet, in the official statistics it is reported as Polish road freight transport.

This rule has the effect of overstating the share of road freight transport in small and peripheral Member States whose hauliers are active in international road freight transport (which is mostly carried out abroad). To be able to present accurate modal share data for road freight transport at a Member State level, it is necessary to calculate the performance of all transport modes based on the same principle. Graph III.6 presents the modal share of road in inland freight transport for individual countries both as reported based on EU legal acts and as adjusted for territoriality.

4.2. INTERNATIONAL ROAD TRANSPORT: IMPORTANCE AND EVOLUTION

The success of the liberalisation of the road freight transport market in the EU and the advanced level of market integration are demonstrated in particular by the growth of cross-trade and cabotage as road transport companies carry out both of these activities abroad (outside their country of registration) with both the origin and the destination of the transport being outside their home country.

4.2.1. Domestic versus international road transport

In 2010, two-thirds (67%) of EU27 road transport was domestic transport carried by domestic operators¹⁸⁵. Domestic road freight transport represented a significantly larger share (78%) of the activities of hauliers registered in the EU-15 Member States than for hauliers registered in the EU-12 Member States (66% of road freight is international).¹⁸⁶

As regards international road freight transport, three categories have to be taken into account:

¹⁸⁵ Road Freight Transport Vademecum, 2010, DG MOVE

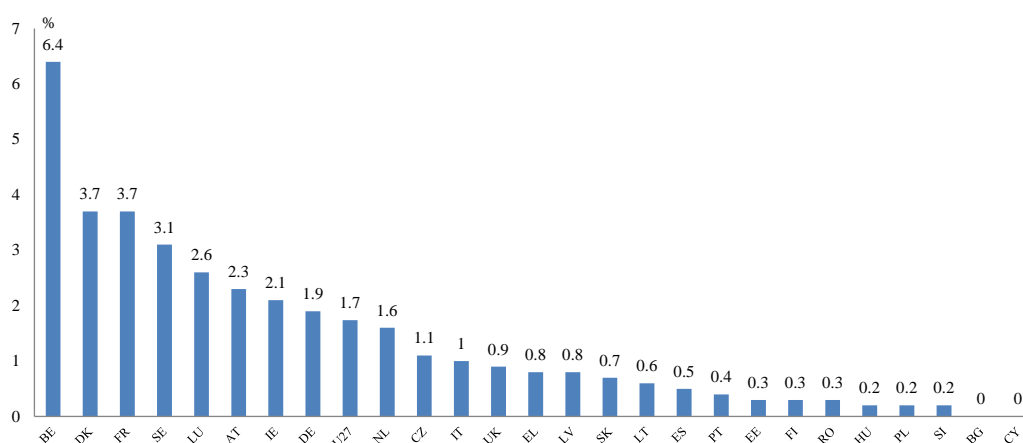
¹⁸⁶ Road Freight Transport Vademecum, 2010, DG MOVE

- i) **bilateral international transport** where either the loading or the unloading takes place in the Member State where the haulier is registered. This category is the most developed activity and, in 2010, accounted for 76% of international road freight transport.
- ii) **cross-trade** where the loading and unloading take place in two different Member States, neither of which is the country where the haulier is registered. This category accounted for 20% of international road freight transport in 2010.
- iii) **cabotage** where loading and unloading take place in the same Member State but the transport is carried out by a foreign haulier registered in another country. Cabotage is therefore considered as international transport even though the transport activity is physically carried out within one Member State – just like domestic transport. In 2010, cabotage accounted for 4% of international road freight transport.

Cabotage and competition or the threat of competition from foreign hauliers have a significant impact on the development of the domestic road haulage contract prices putting pressure on domestic hauliers and increasing competition in the market. Although road freight cabotage activity within the EU grew consistently in tonne-km terms over the period 2005-2010, cabotage still accounts for not much more than 1% of the total EU road freight transport market¹⁸⁷ (corresponding to about 4% of the international road freight market).

Significant differences exist across Member States in their cabotage penetration rates, which can be several times higher than the EU average (see Graph III.7.a). The penetration of foreign hauliers was the highest in the Belgian domestic transport market, where they accounted for 6.4% of the national transport market. In second and third place are France and Denmark with a penetration rate of 3.7%. However, in tonne-kilometre terms Germany and France are the two biggest markets for cabotage as almost two-thirds of the total EU cabotage took place in these two countries in roughly identical proportions.

Graph III.7.a: Cabotage Penetration rate in Member States (2010)*



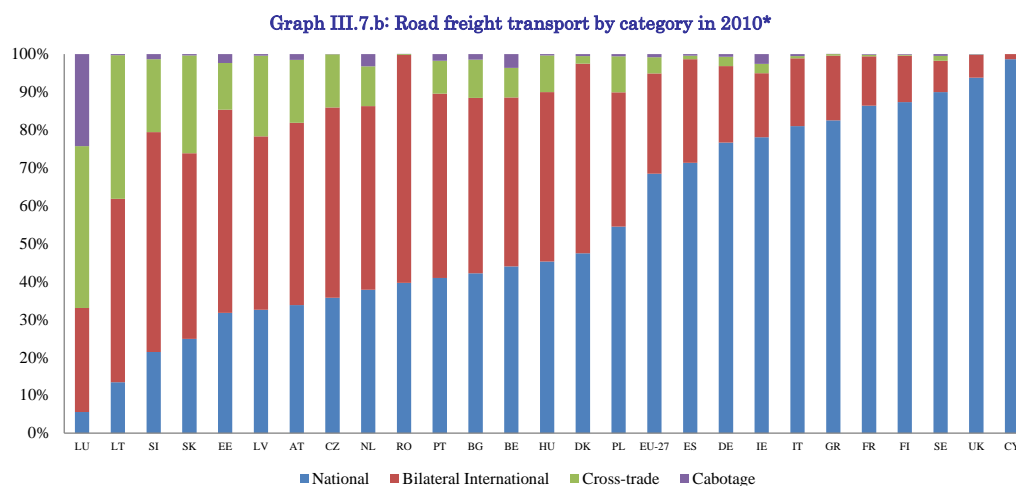
Source: European Commission, Road Freight Transport Vademecum (2011).

*The cabotage penetration rate is defined as the share of cabotage in total national transport including national transport carried out by domestic hauliers and foreign hauliers. Analogously, it would be worthwhile to calculate cross-trade penetration rates for the intra-EU cross-border trade of individual Member States but this information is not yet available.

Another way to look at cabotage is to see the origin of the most active hauliers performing cabotage. In 2010 Polish hauliers accounted for 21% of the total cabotage activity in the EU,¹⁸⁸ ending the previous dominance of German and Benelux hauliers in the European cabotage trade. Hauliers registered in the EU-12 account for about three-quarters of all the cross-trade activities in the EU, with Polish hauliers being the biggest cross-traders with a 27% share of the EU cross-trade market.

¹⁸⁷ It is important to point out that these penetration rates show how much of the total national road freight transport market foreign hauliers account for and as such they underestimate the importance of cabotage transport in the road haulage market. The total road freight transport performance also includes so-called own account transport (transport carried out not by professional hauliers). In tonne-km terms own account transport accounted for about a fifth of the national transport markets on average across the EU as a whole. Additionally, there are also transport activities that are either specialised or local by nature (or both) that are not realistically contestable by foreign hauliers (e.g. municipal waste collection activities). Therefore the real significance and impact of foreign hauliers on domestic transport markets is higher than the statistics suggest.

¹⁸⁸ Road Freight Transport Vademecum, 2010, DG MOVE



Source: European Commission, Road Freight Transport Vademecum (2011).

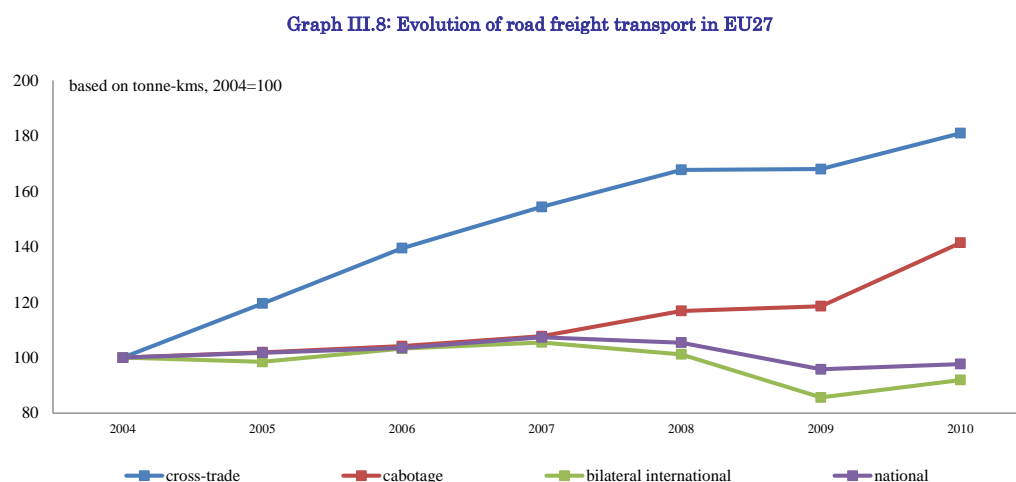
* These statistics correspond to the type of activities performed by domestic hauliers.

The figures vary a great deal from country to country with significant differences between EU-15 and EU-12. While international transport within the EU-15 is still dominated by hauliers registered in the EU-15 countries, transport between EU-15 and EU-12 countries are predominantly carried out by hauliers registered in EU-12 Member States and the share of EU-15 hauliers is negligible in transport among EU-12 countries (less than 0.5%).

4.2.2. Evolution of road freight transport categories

International transport has been growing significantly faster than domestic transport in the EU (graph III.8). In 2010 domestic transport (expressed in tonne-kms) grew by only 1.9% while international transport increased more than 4 times faster at 7.8%. Cabotage was the fastest growing segment of the EU international road freight market (+19.3% in 2010), while cross-trade and bilateral international transport grew at 7.7% and 7.3% respectively in 2010. The lifting of the temporary cabotage restrictions that were applied for a transitional period of up to 5 years to hauliers registered in most of the Member States that joined the EU in 2004 resulted in an almost threefold increase in the cabotage activities of the effected hauliers between 2008 and 2010 (albeit from a low base) while the general relaxation of cabotage rules in May 2010 further contributed to the growth of cabotage across the EU.

Over the period 2004-2010 cross-trade was the fastest growing segment of the international road freight transport market with a growth of about 80%.



Source: European Commission, Road Freight Transport Vademecum (2011).

4.3. ROAD FREIGHT COMPANIES

Official statistics indicate a sector dominated by small operators as only Luxembourg and the Netherlands have an average company size of more than 10 employees¹⁸⁹. However, there has been a trend for many years for freight forwarding and subcontracting to play an increasingly dominant role in road haulage. Although small firms predominate in terms of numbers in the road haulage sector, there appears to be a considerable and growing consolidation in the market, especially once the existence of extensive sub-contracting and strategic alliances between hauliers, shippers and freight forwarders are taken into consideration. Subcontracting may take the form of spot contracts for single loads or long term contracts of several years, possibly even including financial assistance towards the purchase of vehicles or the provision of a vehicle. However, it is worth noting that some of the road freight transport companies registered in the EU-12 Member States are owned and effectively controlled by hauliers from the old EU-15 Member States that exploits comparative cost advantages offered by these countries (such as significantly lower labour costs). However, the extent of this "out-flagging" phenomenon is not possible to judge based on available transport statistics.

4.4. CONCLUDING REMARKS

The road freight sector dominates the provision of goods transport services across the EU as it provides flexible, responsive and cost-effective solutions for shippers. The evolution of international activities shows that despite some remaining restrictions, the sector has been successful in developing cross-border.

The establishment of a common transport policy implies the removal of all restrictions against the hauliers providing transport services on the grounds that they are established in a different Member State from the one in which the services are to be provided while ensuring a fair and efficient competition. The increased integration of the road haulage market should also allow important efficiency improvements to be realised by reducing unnecessary empty running of the vehicles and thereby contribute to the increased long-term sustainability of the road haulage sector and enhance the overall competitiveness of the European economy. The 2011 White Paper on transport confirmed that as part of the process of completing the internal market the elimination of the remaining restrictions on road freight cabotage should be pursued.

Further opening of the EU road haulage market is expected to bring further flexibility and efficiency to operators in the organisation of their work to reduce empty running.

5. AIR TRANSPORT

Liberalisation has started in the 1980s and has contributed to reshaping the air transport sector, with the emergence of a new business model -the low cost carriers - that afforded new routes and lower prices to the consumer. This section deals with airlines. *Box III.2* briefly reviews the main challenges in airports.

5.1. MODAL SHARES AND PERFORMANCES

Measured in passenger-kilometres air transport accounted for 8.2% of the intra-EU passenger transport market in 2010. This represented the second biggest modal share after passenger cars (73.7%) and ahead of bus and coach (7.9%) and railways (6.3%).

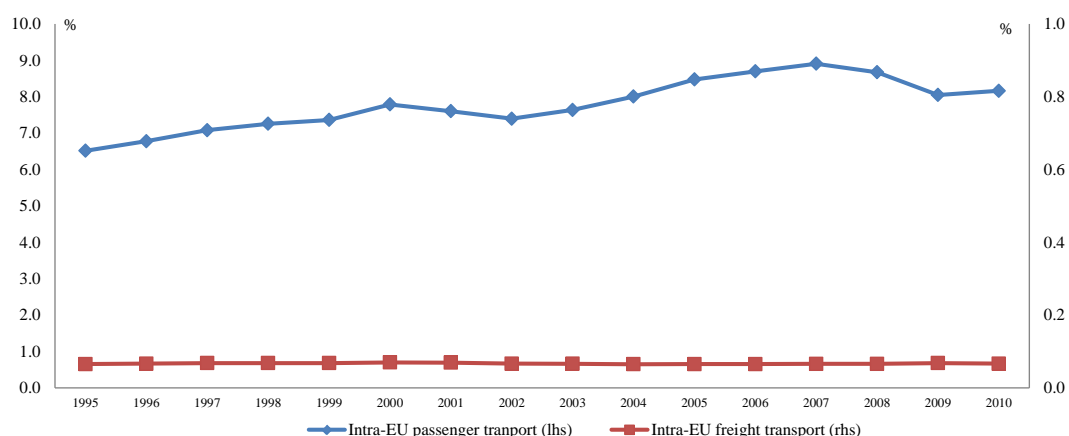
As for freight transport, the picture is rather different as air transport in 2010 represented only 0.67% of intra-EU freight transport expressed in tonne-kilometres. However, in reality the importance of air transport for the economy is much higher than what this indicator suggests. Whereas air freight once was a transport mode reserved solely for emergency shipments, now air cargo is also seen to offer a means to reduce inventory costs and improve the level of customer service. Typical air freight commodities include high value products and time

¹⁸⁹ Statistical Pocketbook (2012).

sensitive shipments and perishable goods. Although measured in weight less than 1 % of all goods worldwide are transported by airplanes, measured by value of goods transported, about one third of all international trade today is moved by air¹⁹⁰. It is also worth noting that it is not entirely feasible to treat air freight as a separate business as freight carrying capacity comes from the following three main sources: space in the holds of passenger aircraft, all-cargo aircraft operated by passenger airlines and all-cargo aircraft operated by specialist air cargo companies.

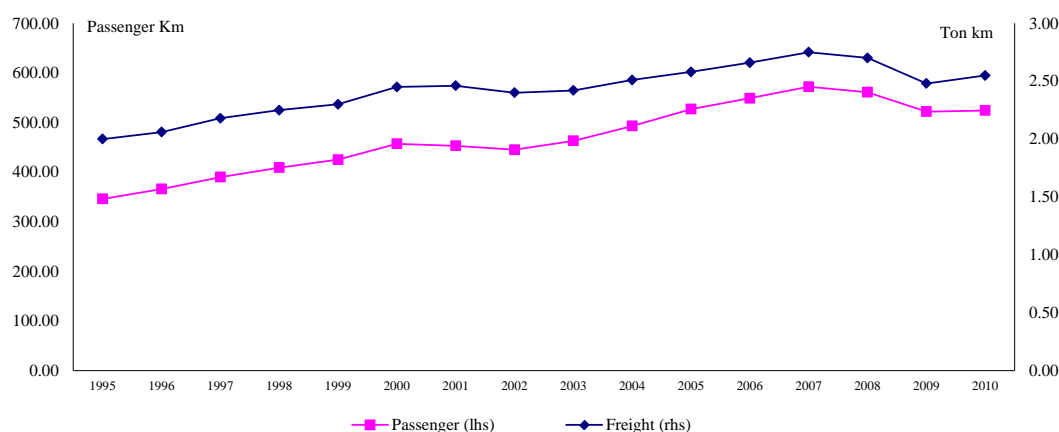
The graphs below show the evolution of intra-EU passenger and freight transport by air over the period 1995-2010 in terms of modal share and performance in passenger-kilometres and tonne-kilometres.

Graph III.9.a: Evolution of modal shares in air transport in EU27



Source: Transport, Statistical Pocketbook (2012).

Graph III.9.b: Evolution of traffic in air transport in EU27



Source: Transport, Statistical Pocketbook (2012).

Of the total EU air passenger transport performance intra-EU traffic had the largest share (41%) while extra-EU traffic and domestic transport accounted for 38% and 21% respectively¹⁹¹.

5.2. COMPETITION BETWEEN LOW COST COMPANIES AND ESTABLISHED CARRIERS

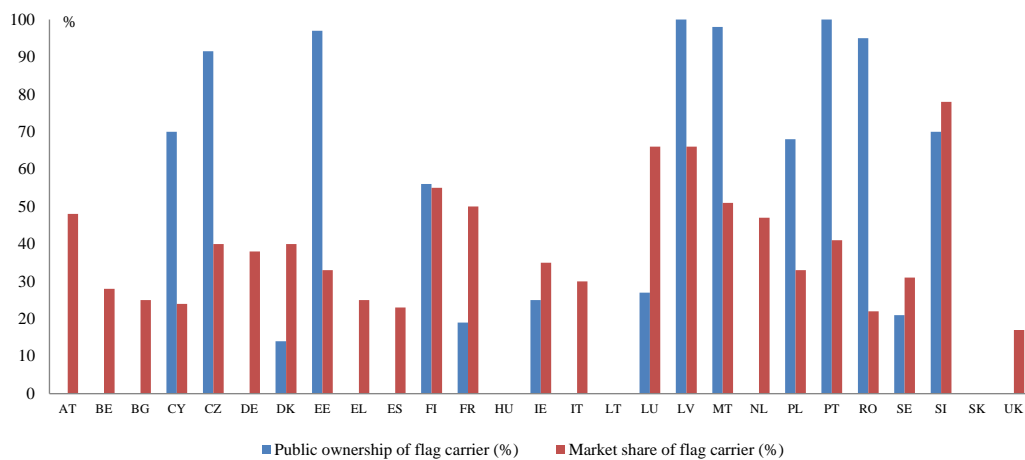
Most of flag carriers hold a market share below 50% in 2009 (graph III.10). All European flag carriers used to be state owned but by now a majority of them are either mostly or wholly private in the EU-15 Member States with the notable exceptions of Portugal and Finland where the respective state is the main owner of the national

¹⁹⁰ Eaton (1994).

¹⁹¹ Transport, Statistical Pocketbook (2012).

airline¹⁹². However, with the sole exception of Bulgaria where the national carrier has been successfully privatised, states still have majority stakes in their flag carriers in the EU-12 Member States that have a national airline¹⁹³.

Graph III.10: Public ownership and market share of EU flag carriers in 2009¹⁹⁴



Source: company websites for data on the ownership structure of the carriers and anna.aero – Airline Network News and Analysis market intelligence based on OAG MAX data for 2009¹⁹⁵

One of the big successes of the liberalisation of the airline industry has been the emergence of low-cost airlines. Worldwide the so-called low cost airlines account for some 23% of all advertised seat-kilometres but the figure for Europe (35.3%) is now higher than any other world region¹⁹⁶. The members of the European Low Fares Airline Association (ELFAA) carried more than 188 million passengers in 2011 (+9,5% compared to 2010). By far the biggest of these airlines is Ryanair that carried 76.4 million passengers while the second biggest was EasyJet with 55.5 million passengers¹⁹⁷.

Charter airlines were originally set up in the 1960's to provide low cost competition to airlines that were licensed to operate scheduled services. With the liberalisation of the air transport in Europe, the rationale for running separate charter airlines became less obvious and some also became scheduled airlines offering seats to the general public alongside large charter groups. Passenger numbers across the chartered sector continue to decline¹⁹⁸.

Compared to the rapid success of low cost airlines, the competition between established carriers has intensified to a much smaller extent as the incumbent national flag carriers have tended to stick to their home bases and made relatively few attempts to gain footholds in other EU countries. However, the economic pressure has been mounting on especially the smaller flag carriers who find it increasingly difficult to compete on the one hand with the low cost airlines who are able to offer low prices and on the other hand with the bigger network carriers who are able to offer connections for on-going travel through their extensive network. The bankruptcy of the Hungarian national carrier, Malev, provided an example earlier this year of the kind of challenges that smaller flag carriers are facing.

There has been a temptation for Member States to subsidise their national flag carriers since the beginning of the liberalisation process of the air transport sector. State ownership of airlines offered additional opportunities for direct or indirect state aid. On the other hand Member States have often placed significant pressures on their flag carriers to maintain networks and operate services that were not financially sustainable for the airlines and these pressures have also contributed to the financial difficulties of the airlines in question, especially since some of their competitors, the low cost airlines faced no such constraints. According to the current interpretation of the relevant state aid rules it is still possible for Member States to invest into their state owned airlines but only if

¹⁹² 56% in the case of Finnair in Finland and 100% in the case of TAP in Portugal.

¹⁹³ Hungary, Lithuania and Slovakia do not have flag carriers.

¹⁹⁴ Markets shares are measured by scheduled seat capacity of carriers. This approach underestimates the market share of carriers with relatively high average load factors.

¹⁹⁵ <http://www.anna.aero/2009/09/11/eu-markets-flag-carrier-dominance-declining-as-lccs-continue-to-grab-market-share/>

¹⁹⁶ Mott MacDonald (2010).

¹⁹⁷ http://www.elfaa.com/Statistics_December2011.pdf

¹⁹⁸ Mott MacDonald (2010).

such investments are based on a clear business rationale upon which a private investor would have based the investment decision. Competing airlines of course watch such state investments very carefully.

Low cost airlines have contributed to improved connectivity of European regions as according to the data published by ELFAA out of the total 426 new city pairs introduced in the EU between 2005 and 2007, its members accounted for 413 city pairs with a particular focus on new Member States.

Low cost airlines have been at the forefront of taking advantage of the freedoms provided by the liberalisation including the so called seventh and ninth freedoms, the right to carry passengers between two foreign countries without any continuing service to the carrier's own country and the right to carry passengers within a foreign country without continuing service to the carrier's own country.

Box III.2: AIR TRANSPORT INFRASTRUCTURE

As far as airports are concerned, the two main challenges in the EU concern capacity and quality of services. There is already EU legislation in place to regulate the allocation of slots at congested airports and also concerning ground handling that covers a wide variety of services for airlines at airports in support of the operation of air services (including technical services such as maintenance and also services that are essential for passengers such as baggage handling).

Concerning ground handling, the current rules were established by Directive 96/97/EC and these include the opening to competition for the majority of ground-handling services. However, the Directive allows Member States to limit competition to two suppliers for a number of restricted services (baggage handling, ramp handling, fuel and oil handling and freight and mail handling). As a result, the degree of competition in these services varies significantly across Member States. While some Member States have opened up restricted services to full competition, others have decided to limit competition to the two service providers specified in the current EU legislation. The number of third-party handling providers exist in some of the busiest airports of the EU - in Germany, France, Spain, Portugal, Greece, Cyprus, Austria and Belgium.

In its Better airports package adopted on 1 December 2011, the European Commission proposed a package of measures aiming at addressing the capacity shortage at Europe's airports and improving the quality of services offered to passengers¹⁹⁹.

5.3. CONCLUDING REMARKS

The air transport sector is fully liberalised in the EU and consumers have benefited from the liberalisation in terms of cheaper prices and more available flights. The liberalisation of the supporting industry has contributed to this success.

However, the result of the liberalisation process is a very competitive market which is dynamic and unstable and poses continuous challenges for airlines to adapt. This market situation is especially challenging for smaller traditional airlines and new start-ups that find it very difficult to find their place in the market which results in a high failure rate in the airline industry. Further EU regulation of the supporting industry can contribute to improving fair competition between carriers.

6. CONCLUSION

The summary table (table III.4) below provides an assessment of the overall competitive situation in transport modes²⁰⁰. Here again, the reading of this table can be made at different levels.

First, **competition in individual Member States is heterogeneous**. In road transport, some Member States (Slovakia, Lithuania, Italy, Spain, Finland, Luxembourg) are lagging behind in road and railways. Others such as Estonia, Greece, Spain are mostly performing badly in road transport outside their own territories.

¹⁹⁹ COM(2011)823 final

²⁰⁰ At this stage of the analysis, some choices had to be made in order to screen the competitive situation in the transport segments. As regards market structure, the threshold of 80% has been taken for market shares of railway freight and passenger undertakings; beyond 80%, it could be assumed that competition is insufficient. In air transport, as in e-communications in annex 2, the threshold of 50% has been taken as the market has been opened at an earlier stage. In road, in road transport, the cabotage penetration rate has been observed in level and growth and performances above EU average are considered positive.

Second, **compared to the energy and e-communications, market opening in transport is heterogeneous due to different EU requirements** (see section 3 – Regulatory framework of network industries). The same level of market opening across transport modes is not achieved although it could favour multi-modality. Multi-modality is a key issue as people and goods should be able to move easily from one mode to another one. However, the heterogeneity of market opening across modes makes it more difficult.

Table III.4 – Summary table of market opening in transport^a

	RAILWAYS							ROAD					AIR			PORTS
	Share of freight operator > 80%	Share of passenger operator > 80%	Public ownership of the first freight operator (>50%)	Public ownership of the first passenger operator (>50%)	Unbundling with infrastructure manager (*)	PSO - Use of competitive tendering (**)		Cabotage Penetration rate in 2010	Cabotage Penetration rate - Evolution 2005-2010 (in pp)	International activity of domestic hauliers in 2010	International activity of domestic hauliers - Evolution 2005-2010 (in pp)		Market share of flag carrier >50%	Public ownership of flag carrier > 50%		Assessment of port facilities (***)
AT	85.40	94.20	100.00	100.00			AT	2.3	0.3	12.3	12.0	AT	48.00	0.00	AT	
BE	88.18	94.80	100.00	100.00			BE	6.4	3.4	9.5	6.1	BE	28.00	0.00	BE	6.5
BG	73.44	97.40	100.00	100.00			BG	0.0	3.4	32.6	29.2	BG	25.00	0.00	BG	3.8
CY	No rail market						CY	0.0	0.0	0.0	0.0	CY	24.00	70.00	CY	5.1
CZ			100.00	100.00			CZ	1.1	0.9	22.9	22.0	CZ	40.00	91.50	CZ	4.7
DE	75.00	92.00	100.00				DE	1.9	0.4	2.5	2.1	DE	38.00	0.00	DE	6.1
DK	75.00	65.00	2.00	100.00			DK	3.7	1.8	6.3	4.5	DK	40.00	14.00	DK	6.2
EE	57.00	50.00	100.00	100.00			EE	0.3	0.2	24.8	24.6	EE	33.00	97.00	EE	5.6
EL			100.00	100.00			EL	0.8	0.4	0.1	-0.4	EL	25.00	0.00	EL	4.1
ES	91.92	100.00	100.00	100.00			ES	0.5	-0.2	2.1	2.3	ES	23.00	0.00	ES	5.8
FI	100.00	100.00	100.00	100.00			FI	0.3	0.2	0.9	0.7	FI	55.00	56.00	FI	6.2
FR	80.00	99.00	100.00	100.00			FR	3.7	1.1	0.4	-0.7	FR	50.00	19.00	FR	5.6
HU	80.53	98.17	0.00	100.00			HU	0.2	0.0	25.5	25.6	HU	n.a.	n.a.	HU	4
IE	100.00	100.00	100.00	100.00	(derogation)		IE	2.1	1.0	6.3	5.3	IE	35.00	25.00	IE	5.2
IT	75.90	91.70	100.00	100.00			IT	1.0	0.5	0.7	0.2	IT	30.00	0.00	IT	3.9
LT	100.00	100.00	100.00	100.00			LT	0.6	0.3	42.3	42.0	LT	n.a.	n.a.	LT	4.9
LU	100.00		100.00	100.00			LU	2.6	-2.6	66.9	69.6	LU	66.00	27.00	LU	5.2
LV	76.70	89.43	100.00	100.00			LV	0.8	0.8	32.1	31.4	LV	66.00	100.00	LV	4.7
MT	No rail market						MT					MT	51.00	98.00	MT	5.6
NL	67.00	95.20	6.00	100.00			NL	1.6	0.7	13.3	12.6	NL	47.00	0.00	NL	6.8
PL	64.18	46.92	100.00	100.00			PL	0.2	0.1	16.8	16.7	PL	33.00	68.00	PL	3.4
PT	9.00	9.60	100.00	100.00			PT	0.4	0.1	13.0	13.0	PT	41.00	100.00	PT	4.9
RO	45.30	96.52	50.00	100.00			RO	0.3	0.1	5.8	5.7	RO	22.00	95.00	RO	2.8
SE	60.00		100.00	100.00			SE	3.1	1.6	1.5	-0.1	SE	31.00	21.00	SE	6
SI	92.46	100.00	100.00	100.00			SI	0.2	-0.2	35.1	35.3	SI	78.00	70.00	SI	5.2
SK	95.75	99.99	100.00	100.00			SK	0.7	0.0	36.1	36.1	SK	n.a.	n.a.	SK	
UK	48.90	10.30	0.00	0.00			UK	0.9	-0.3	0.4	0.7	UK	17.00	0.00	UK	5.6
EU average	66.80	66.20						1.70	0.60	7.80	2.70		34.74			
Improvement	Above	Above	Above	Above	(*)	(**)		Below	Below	Below	Below		Above	Above		Below
Median	76.70	95.20	-	-	-	-		0.80	0.31	10.88	9.01		36.50	-		5.20
Cut-off	80.00	80.00	50.00	50.00	-	-		1.70	0.60	7.80	2.70		50.00	50.00		5.20



ongoing privatisation



High



Medium



Low

a. Competition indicators are lacking. For this reason, the port and road transport modes include performance indicators.

(*) In red, no separation between infrastructure and services (holding); in orange, autonomous subsidiaries (annex V of the Communication on railways (2006), in green, unbundling. (**) in red, direct negotiation only; in orange, direct negotiation and competitive tendering; in green competitive tendering only. (***) WEF indicators on the perception of ports facilities with 7 for well-developed and 1 for underdeveloped. In red, scores below the mean (5,1). In green, scores above EU average.

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