Risk Management and Sustainable Development of Telecommunications Companies*

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Abstract

Globalisation determines a continuous increase of risks for companies. Hence, the ability to prevent threats and catch opportunities becomes strategically relevant for corporate success. However, different approaches of risk management can be chosen by firms operating in a same industry.

This article is focused on telecommunications companies in global markets. Such companies contribute to market globalisation by facilitating information transmission and knowledge sharing, but they are also exposed to a variety of risks determined by legislative limitations and connected to the social and environmental impact of their processes. Also through an empirical investigation, the paper reflects on sustainable development of telecommunications companies, which depends on the ability to manage risks in a globally responsible way.

Keywords: Risk Management; Sustainability; Global Responsibility; Telecommunications

1. Risk Management in Telecommunications Companies

Market globalisation and the ongoing world economic crisis have implied great troubles for a lot of companies, especially in terms of economic recession, difficulties in international partnerships, credit crunch, and more complexity in combining the global development with the needs of adaptation to the local context (Hong, Song 2010; Westjohn et al. 2012). All these factors have emphasised new types of risks and the difficulty to face them correctly in order to continuously develop the company's strategy.

The global competition implies the enlargement of firm relations and the change in critical success factors (Brondoni 2010). Consequently, risk management

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becomes more and more important for assuring long-term effectiveness, based on the safeguard of stakeholders' interests, integration among economic, competitive, social and environmental success, and sustainable development (MacDonald 2011; Salvioni 2012).

In recent years, the increasing riskiness has drawn greater attention to internal controls and has stressed the role of risk management as a key driver of corporate development.

Risk factors, associated to threats and opportunities, affect the consistency of success factors, as well as the way they interact and manifest themselves. Furthermore, such factors evolve and differentiate depending on the economic and financial context, social and environmental conditions and competition.

For several reasons, what we have stated above can be specifically referred to the telecommunications industry, which is investigated in this research. Firstly, such an industry considerably contributes to market globalisation, since it brings down space and time barriers among countries, economic systems and firms, making information sharing possible. Secondly, telecommunications companies are in continuous development and their activity also facilitates the growth of other industries. Thirdly, the telecommunications companies' production process depends prevailingly on assets (e.g. energy, grids, information, channels and means of transmission) the use of which could be restricted by the law, as well as in consideration of social and environmental issues (Palacios-Marqués, Devece-Carañana 2013).

Although telecommunications improvement originates a variety of advantages, it also determines significant risks due to external and internal conditions (Blechar, Hanseth 2007). External conditions concern laws and regulations (Bauer 2005; Jull, Schmidt 2009; Zheng, Ward 2011), politics, macroeconomic phenomena, consumer habits and fashions, environmental safeguard, health protection, and improper use or dissemination of information; internal conditions are related to the telecommunications company's operations, which produce legal, administrative, economic, social and environmental impacts.

Based on these premises, the article is organised as follows. Paragraph 2 describes the growth of telecommunications industry and the emerging expectations and risks in the global scenario. Paragraph 3 explains the research methodology and analyses the results of an empirical investigation based on the top five European telecommunications firms. Paragraph 4 discusses the main conclusions of the study.

2. The Role of Telecommunications in Global Markets

Telecommunications firms offer a wide service range that includes but is not limited to phone calls, SMS, MMS, the Internet access, data transfer, tele-conferencing, tele-working, mobile banking, payment services, and online games (Gruber, Koutroumpis 2011). The set of services pursues qualitative improvement and it is in continuous expansion all over the world.

Nowadays, the growth of this industry is a well-documented fact in both developed and developing countries, as confirmed by the International Telecommunication Union (ITU) statistics.

□ *Since 2005 the number of telephone subscriptions has more than doubled in the world, especially in developing countries where mobile-cellular subscriptions have become very popular (Table 1).*

□ *As concerns the Internet, ITU statistics have proved a generalised increase over the period 2005-2013 in relation to households with access at home, as well as individuals using the Internet (Table 2). Today almost 2.8 billion individuals are online, and 65% of them live in developing countries.*

Table 1: *Telephone Subscription Indicators by Level of Development*

	2005	**2011**	**2012 ***	**2013 ***	**2005**	**2011**	**2012 ***	**2013 ***
Fixed-telephone subscriptions:	*millions*				*per 100 inhabitants*			
developed countries	570	542	531	520	47.2	43.7	42.7	41.6
developing countries	673	662	655	652	12.7	11.5	11.3	11.1
world	1,243	1,204	1,186	1,171	19.1	17.3	16.9	16.5
Mobile-cellular subscriptions:	*millions*				*per 100 inhabitants*			
developed countries	992	1,475	1,538	1,600	82.1	119.0	123.6	128.2
developing countries	1,213	4,487	4,872	5,235	22.9	78.3	84.3	89.4
world	2,205	5,962	6,411	6,835	33.9	85.5	91.2	96.2

* Estimate.

Source: ITU Statistics from www.itu.int

Table 2: *Internet Access Indicators by Level of Development*

	2005	**2011**	**2012***	**2013***	**2005**	**2011**	**2012***	**2013***
Households with Internet access at home:	*millions*				*per 100 inhabitants*			
developed countries	n/a	n/a	n/a	n/a	44.7	70.2	74.0	77.7
developing countries	n/a	n/a	n/a	n/a	8.1	20.2	24.0	28.0
world	n/a	n/a	n/a	n/a	18.4	33.6	37.4	41.3
Individuals using the Internet:	*millions*				*per 100 inhabitants*			
developed countries	616	875	913	958	50.9	70.5	73.4	76.8
developing countries	408	1,398	1,584	1,791	7.8	24.5	27.5	30.7
world	1,024	2,273	2,497	2,749	15.8	32.7	35.7	38.8

* Estimate.

Source: ITU Statistics from www.itu.int

□ *ITU statistics per country over the period 2000-2011 reaffirm that telecommunications development has been higher and quicker in the emerging markets, such as the BRICST.*

A comprehensive analysis of ITU statistics permits us to state that economic growth and telecommunications development evolve together. Moreover, in specific circumstances a 'leapfrogging process' occurs (Lam, Shiu 2010), so that emerging countries' firms and consumers operating as latecomers take advantage of technological and market innovations previously developed in the old industrialised regions, and get ahead of these latter.

According to the literature, there is a relationship between economic growth and telecommunications development. A two-way relationship in which telecom services impact on and are also influenced by economic growth seems to prevail in the most developed regions: the US (Cronin et al. 1991; Cronin et al. 1993), Central and Eastern Europe (Madden, Savage 1998), the OECD countries and those where a critical mass of phone lines has been reached (Röller, Waverman 2001), the regions where telecommunications have been considerably privatised (Chakraborty, Nandi 2003), and the high income European states (Lam, Shiu 2010). On the contrary, a unidirectional relationship has been discovered in low and middle income countries, especially in Africa, the Americas, Asia and Oceania, where the economic growth affects teledensity (i.e. fixed-line and mobile penetration rate) (Lam, Shiu 2010), but there is no reverse causality.

So far telecommunications development has been largely investigated in relation to economic growth; however, social and cultural aspects and the environmental impact of telecommunications progress have been often neglected in business economics research. Furthermore, the emphasis currently placed by national and supranational organisations, including the UN and the EU, on their own strategies and policies for sustainable development stimulates new directions in the study of telecommunications to cover the existing gap.

> □ *According to the Brundtland Commission established by the United Nations, sustainable development "meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). This definition, reaffirmed in 2002 UN World Summit in Johannesburg, promotes the integration of three pillars: economic growth, social inclusion and environmental protection. A wider concept based on Agenda 21 and 2005 Unesco Convention also includes cultural diversity as the fourth pillar of sustainable development, which should take place on local, regional, national and global level.*

Quantitative and qualitative progress of telecommunications worldwide imposes to rethink governance principles and goals of companies operating in the industry, in order to assure an integrated and equitable treatment of all stakeholders' different expectations. This implies an enlargement of firm responsibility, which involves economic, social, cultural and ecological cares and overcomes time and space barriers (Salvioni, Bosetti 2009; Almici 2012). Consequently, decision-making in telecommunications firms should take account of all the success key factors for an harmonic development of the activities, in full respect of all the interests manifested by the stakeholders.

Basic principles of sustainable development suggest that telecommunications companies expand their business to an extent that permits to satisfy all the requests of interconnection among individuals around the world, sustaining in such way both social inclusion and economic progress. However, carrying out this peculiar function requires large investment in equipment, such as grids, satellites, and repeaters, which can produce dangerous externalities on human health and the environment, such as technical failures and electromagnetic radiation. In order to reduce the risk of such critical effects, national and supranational regulators constantly issue and update specific rules to bound the activities of telecommunications firms, also where the markets are substantially privatised and liberalised. The regulatory intervention is also necessary to promote sound competition in both local and global contexts (Zheng, Ward 2011; Hausman, Taylor 2013).

Telecommunications companies are expected to implement strategies for sustainable growth and obtain a well-balanced mix of economic, social and environmental results by operating in compliance with laws and regulations.

Evidently, a number of threats could jeopardise the sustainability-oriented path undertaken by telecommunications firms. To prevent undesirable and sometimes detrimental consequences, a globally responsible behaviour should lead to adopt appropriate risk management policies to face any type of risk. Moreover, telecommunications firms should consider the potential impact of their operations from different perspectives. In this regard, legal, administrative, economic, social, environmental and market issues that could emerge from business affairs should be analysed together. This approach should help the company to appreciate the coherence between its behaviour and performances at present, on the one hand, and the stakeholders' expectations for today and the future, on the other hand.

3. Sustainable Risks of Telecommunication Companies

3.1 Research Methodology

Considering the relevance of risk management for a sustainable growth of the telecommunications industry, we developed an empirical research aimed at verifying the risk management practices actually carried out a selected sample of companies. In this regard, the research question inspiring the paper is the following: *to what extent can telecommunications development be considered sustainable?*

In order to answer the above-stated question, we carried out a content analysis (Weber 1990; Neuendorf 2002; Krippendorff 2004) considering the top five largest telecommunications companies by operational revenue and market capitalisation, listed on one or more of the main European stock exchanges in February 2013 and with a functioning website (Table 4). The company selection made use of Amadeus database and referred to class 61 – Telecommunications of NACE Rev. 2, as revised in 2008.

Table 4: *Sample of Companies*

Company	Operational revenue (millions of €)	Market capitalisation (millions of €)	Stock exchanges
VODAFONE GROUP	66,026.938	93,146	London Stock Exchange; Börse Frankfurt
DEUTSCHE TELEKOM	63,015.000	35,897	Börse Frankfurt; London Stock Exchange; Borsa Italiana
FRANCE TELECOM	46,577.000	20,452	Euronext Paris; Börse Frankfurt; London Stock Exchange; Borsa Italiana
TELECOM ITALIA	30,825.000	8,345	Borsa Italiana; London Stock Exchange; Börse Frankfurt
BT GROUP	23,605.964	25,389	London Stock Exchange; Börse Frankfurt

The content analysis was carried out on 2012 annual report for all companies, except for France Telecom, the most recent annual report of which at the time of the investigation referred to 2011.

The content analysis focused on the following aspects:

- company's identification and description of relevant risks;
- company's risk treatment processes.

More exactly, the information disclosed by the selected companies was collected in an Excel database according to the following steps:

1. risk selection;
2. risk identification, in terms of description of the risk and the event generating the risk;
3. risk classification into homogeneous categories, according to the business economics literature;
4. analysis of the risk response;
5. association of such categories of risk to different areas of corporate responsibility: legal responsibility, administrative responsibility (also defined as governance responsibility), economic responsibility, social responsibility, environmental responsibility, and market responsibility.

3.2 Results

The risk classification and the risk response stemming from steps 1 to 4 are the following, in a totally random order:

a) *compliance risk*, that is the risk of not complying with laws and regulation that already exist or could be introduced in future. More exactly, compliance risk is related to a number of events: a possible reduction in geographic coverage; deterioration in service quality; customer dissatisfaction in case of change in legislative, regulatory or government policy; the obligation of paying damages due to the non-respect of a given regulation; the adoption of new laws modifying the allocation of frequency spectrum or making the costs unsustainable; the possibility of losing a lawsuit against government agencies, competitors or other parties. With reference to this type of risk, some of the

selected companies have disclosed their intention to arrange early warning and precautionary legislations;

b) *technical risk*, such as the risk of network interruption due to physical attack or theft of components and the risk of losing confidential customer data or the availability of critical systems due to attacks. In order to prevent or reduce any damage from this type of risk, companies have declared the use of data protection systems or the implementation of technical measures;
c) *reputational risk* in terms of possible negative impact of specific events on the company's image (e.g. interruptions of the service caused by flood, storms, fires, and wars). No selected companies have disclosed how this risk is managed;
d) *competition risk*, that is the risk of losing market share due to different reasons, such as: the increase of competition in the telecommunications industry with a cannibalisation effect from technological progress; the introduction of new types of competitors (i.e. internet players and electronic industries); the reduction in mobile voice and data services; the shortening of innovation cycles, which requires quicker innovations in products and services. The risk response mainly consists in offering new products and services through a new business combination, improving the competitive position regarding mobile spectrum in major metropolitan areas, and consolidating the position in the fast-growing prepay segment;
e) *health risk* from electromagnetic fields, which can badly affect the environment and people leaving there. Thus, this type of risk includes also the environmental one. Protection from this risk includes different measures, like health and safety policy, cooperation with the EU institutions and the World Health Organization for early warning and precautionary legislations, and financial support to independent research on mobile communications;
f) *country risk*, expressing the impact on the company produced by an economic or political event occurring in the country (e.g. exit from the eurozone, currency devaluation, price rise due to expansionary monetary policies in the EU and the USA, and the economic slowdown). Only one company declared to manage this risk by monitoring the eurozone situation and by adopting a business continuity plan;
g) *asset impairment risk*, representing the risk of decrease in the company's asset value, affecting the company's ability to pay dividends or repurchase its own shares. In order to face this risk, companies arrange periodical reviews of the value by means of an impairment test, in addition to the regular annual measurements;
h) *liquidity risk*, connected to the availability of cash deposits and investments;
i) *exchange rate risk*, due to the use of a foreign currency. Most of the selected companies have adopted derivative instruments in response to this risk;
j) *counterparty risk*, related to specific situations in which the counterparty defaults the original conditions: supply risks related to delivery bottlenecks and supplier's default belong to this category. Among the policies implemented for managing this kind of risk there is the adoption of a supplier evaluation system;

this type of information has been disclosed by only one company among the selected ones;

k) *interest rate risk*, expressing the risk of an interest rate increase; in general, in order to limit the effect of interest rate fluctuations, companies make use of financial instruments;
l) *equity risk*, representing the risk that a specific investment depreciates because of stock market dynamics;
m) *corporate governance risk*, consisting in the risk of irregularities in governance and control processes;
n) *personnel risk*, related for instance to the company's ability to attract and retain skilled personnel and to replace expertise in key fields by taking advantage;
o) *credit risk*, referring to the risk that borrowers default on their debts by failing to make payments;
p) *market risk*, which is the risk of losses in positions arising from movements in market prices;
q) *weather risk*, referring to the risk of damage due to the interruption of telecommunication services caused by the weather and related phenomena (storms, floods, fires, etc.);
r) *fraud risk*, that is the risk of falling victim of fraud.

Table 5 and Chart 1 summarise the types of risk identified by the selected companies, specifying how many events can be classified in each risk category.

According to Table 5, the only risk identified by all the selected companies is the liquidity risk, while the weather risk and the fraud risk are underlined only once. Compliance risk, technical risk, competition risk, country risk, and counterparty risk are identified by four companies out of five, while the other risks are faced by a smaller number of companies (three or two out of five). In particular, only three companies out five indicate the health risk despite the great impact that telecommunications have on the environment.

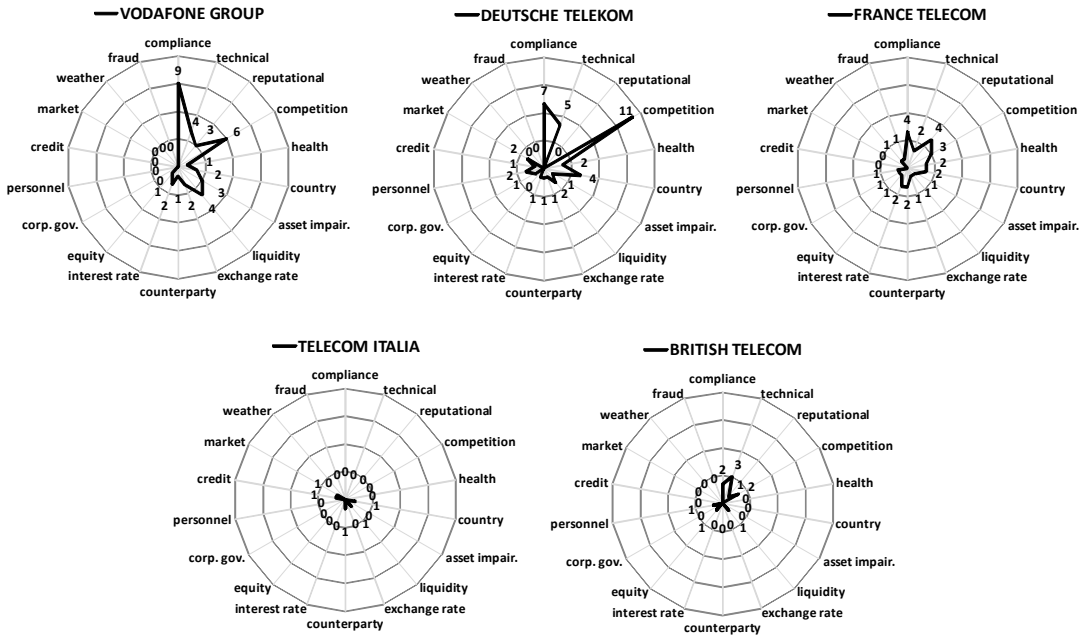
Table 5: *Risk Identified for the Selected Companies*

Risk	Vodafone Group	Deutsche Telekom	France Telecom	Telecom Italia	British Telecom
Compliance	9	7	4	0	2
Technical	4	5	2	0	3
Reputational	3	0	4	0	1
Competition	6	11	3	0	2
Health	1	2	2	0	0
Country	2	4	2	1	0
Asset impairment	3	1	1	0	0
Liquidity	4	2	1	1	1
Exchange rate	2	1	1	0	0
Counterparty	1	1	2	1	0
Interest rate	2	1	2	0	0
Equity	1	0	1	0	1
Corporate governance	0	1	1	0	0
Personnel	0	2	1	0	1
Credit	0	1	0	1	0

Market	0	2	0	1	0
Weather	0	0	1	0	0
Fraud	0	0	1	0	0

As regards the number of specific events reported by each company and referable to each risk category, we observe that "compliance" and "competition" risks are the most underlined ones, especially by Vodafone and Deutsche Telekom, as shown in the specific radars of Chart 1; conversely, the attention paid to "health risk" results again to be low, with reference to the frequency of information too. British Telecom and Telecom Italia are the companies that identify the most limited types of risk, disclosing only one to three potential events.

Chart 1: *Types of Risks of each Selected Company*



After identifying the different risk categories for the selected companies, we associated them to one or more areas of corporate responsibility. More exactly, risks can be ascribable to:

- *legal responsibility*, concerning the observance of legal provisions and regulations. This type of responsibility entails managing a specific risk, that is the compliance one;
- *administrative responsibility* (also called *governance responsibility*), which refers to effective controls and procedures aimed at assuring transparency, equity and a sound corporate governance system. In this area the focus is on risks related to corporate governance, fraud and personnel;
- *economic responsibility*, concerning the company's commitment towards stakeholders' economic expectations. In order to satisfy such expectations, companies have to cope with specific risks, such as technical and reputational ones and those connected to competition, country, asset impairment, liquidity,

exchange rate, counterparty, interest rate, equity, credit, market, weather and fraud;
- *social responsibility*, representing the commitment towards people interacting with the company; in this area, the focus is on technical, reputational, health and personnel risk;
- *environmental responsibility*, which is connected to the way the company manages the impact of its activities on the environment;
- *market responsibility*, requiring fair relationships with suppliers, customers and competitors. With reference to the disclosed risks, the technical one assumes relevance in this responsibility area.

According to the above-stated classification, Table 6 provides a qualitative representation of the results, which are also represented in Chart 2 for each firm.

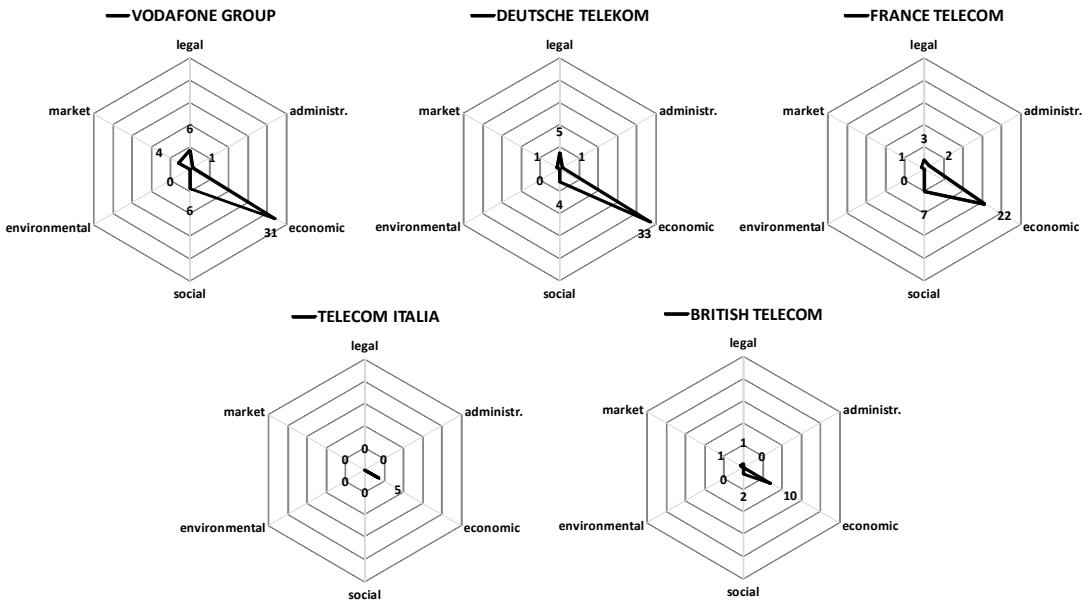
More exactly, Table 6 underlines that most of the selected companies focus their attention on the economic aspects rather than adopting a global approach to responsibility. Indeed, the majority of the risks they have disclosed refer to the economic area; on the contrary, only few risks – among those identified – concern social, market, legal and administrative responsibility.

Table 6: *Corporate Responsibility and Risk Identification*

Risk	**Legal responsibility**	**Administrative responsibility**	**Economic responsibility**	**Social Responsibility**	**Environmental responsibility**	**Market responsibility**
Compliance	X					
Technical			X	X		X
Reputational			X	X		
Competition			X			
Health				X		
Country			X			
Asset impairment			X			
Liquidity			X			
Exchange rate			X			
Counterparty			X			
Interest rate			X			
Equity			X			
Corporate governance		X				
Personnel		X		X		
Credit			X			
Market			X			
Weather			X			
Fraud		X	X			

For each company, Chart 2 shows how many risks, among the ones described in the annual reports, can be associated to each area of responsibility. According to the radars, the selected companies (especially Deutsche Telekom and Vodafone) tend to promote economic responsibility, while the other areas are often neglected.

Chart 2: *Risk Responsibility in the Selected Companies*



4. Risk Management and Sustainability in Global Markets

Statistics mentioned in this article show that the telecommunications industry has consolidated its already well-established position in industrialised countries and has significantly developed in low income countries. In order to ascertain whether telecommunications development is any longer economically sustainable by rich countries and whether it can be judged as sustainable in poor countries, two facts should be taken into account: scope synergies and responsible commitment not to compromise the interests of future generations.

Rich countries have reached widespread prosperity, which is nevertheless jeopardised by the present recession; hence, they pay attention to the risks related to economic success. Poor countries have largely stimulated the expansion of telecommunications, which is still under way, but they cannot contribute to wealth creation and local development.

With reference to the five companies investigated in this research, the risk focalisation and the assumption of different but integrated responsibilities emphasise three variables that affect future sustainability: competitive dynamics, social and cultural diversity, and environmental impact.

Risks connected to global competitive dynamics influence telecommunications management in different sales markets. On the one hand, these risks stress the trend towards concentration of offer, giving rise to dangerous dominant positions and trusts; on the other hand, such risks require a careful consideration of the conditions put by the emerging countries to further request of telecommunications services. The results of our investigation prove that the selected companies, except Telecom Italia, are aware of competition risks, consisting in the potential entry of new

players and in the necessity of continuous process and product innovation, which requires ever-increasing investments and can be overcome through synergic aggregation among firms.

Risks linked to socio-cultural diversity of countries where telecommunication companies operate depend on the basic characteristics of the countries themselves, such as political and religious factors, territory development, and education and training. On the one hand, the companies analysed express their legal responsibility related to compliance risk, which influences the regulatory relationships between companies and governments and between companies and service users. On the other hand, the selected companies seem to pay attention to social responsibility: indeed, they are interested not only in technical and operational aspects of services, but also in health risks stemming from electromagnetic waves exposition, as well as in risks related to the personnel training and loyalty.

Environmental risk has not been discussed in the five companies' reports. However, we can reasonable suppose that the firms have managed this type of risk as part of their social responsibility, due to the effect on the customers' health. Environmental responsibility surely represents a propulsive element for a country's development, because it also helps companies attract the approval and the resources they need to thrive.

In this regard, companies are expected to play an active role by proposing initiatives and agreements with their partner countries, in order to lead and develop sustainable innovation, limit unfair competition and implement scope economies to satisfy their stakeholders. This should be put in place by safeguarding the economic, social and cultural expectations of future generations and by respecting the environment.

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