

**A strategic analysis of the Greek Mobile Telecoms Industry:
assessment of the Industry structure and forecast of future
developments**

PAPANIKOLAOU, Sotiria

*This dissertation is submitted in partial fulfillment of the requirements of
Staffordshire University for the award of Master of Science in Management*

October 2006

EXECUTIVE SUMMARY

The global spread of mobile telephony within the last decade has been nothing short of phenomenal. The most impressive is the fact that in recent years, global mobile telephony has experienced spectacular demand growth that is unmatched by anything in the long history of fixed network-based telecommunications. It has more than 2 billion subscribers worldwide and has truly become the most popular telecommunications access mode, well ahead of landline calling and its base of 1.2 billion fixed main lines. The **mobile telecoms industry** is one of the most dynamic sectors and the fastest expanding sector of the European economy. This is nothing more than an economic revolution. In Greece the penetration of mobile telephony has been astronomical. Greece's mobile operators Cosmote, Vodafone, TIM and Q-TELECOM held, nowadays, a joint part on all matters pertaining to the economy and society and on the framework, in which mobile telephony is operating in Greece today. They get influenced by the constant changes of the external legal, economic, social and technological -national and international- environment and try to achieve a strategic fit between their strengths and weaknesses. Their main objective is to gain the competitive advantage in the Greek market. This is rather difficult in an intensively competitive mobile telecoms industry. The past for the mobile telecoms industry in Greece was more than bright. The future is uncertain but with great opportunities, though. Technological developments are the major driver of all the changes. The bet for the Greek operators lies on which will implement the most successful strategy in order to be ahead of the others.

ACKNOWLEDGEMENT

I am grateful to **Dr. Yannis Toliás** for his contribution to this project. I thank him for the helpful suggestions, advice, comments and ideas, but – most of all – encouragement.

LIST OF CONTENTS

EXECUTIVE SUMMARY	ii
ACKNOWLEDGEMENT	iii
LIST OF CONTENTS	iv
LIST OF TABLES	v
LIST OF FIGURES	vi
INTRODUCTION	7
Part 1 The external environment of the Industry	12
1.1 POLITICAL/LEGAL FACTORS	12
1.2 ECONOMIC FACTORS	15
1.3 SOCIAL FACTORS	17
1.4 TECHNOLOGICAL FACTORS	19
Part 2 The internal environment of the Industry	22
2.1 S.W.O.T. analysis of the Greek Mobile Telecoms Industry	22
2.2 S.W.O.T. analysis of Cosmote	28
2.3 S.W.O.T. analysis of Vodafone	34
2.4 S.W.O.T. analysis of TIM	39
2.5 S.W.O.T. analysis of Q-Telecom	45
Part 3 International trends in the Mobile Telecoms Industry	49
Part 4 Projected trajectories	54
4.1 The new “datacom space”	
4.2 Forecasting the international mobile telecoms industry	56
4.3 Forecasting the European mobile telecoms industry	58
4.4 Forecasting the Greek’s behaviour towards mobile phones	61
4.5 Forecasting the evolution of the Greek mobile telecoms industry	64
CONCLUSIONS & RECOMMENDATIONS	72
APPENDIXES	74
REFERENCES	81

LIST OF TABLES

<i>Table 1: Regional shares of fixed main lines and mobile subscribers, 1995 and 2001 (Banerjee, A. and Ros, A., 2004)</i>	17
<i>Table 2 : S.W.O.T. analysis</i>	22
<i>Table 3 : Breakdown of revenues, Greek market, 2002-2004.</i>	
Figures in thousand Euros. (source: company reports)	26
<i>Table 4 : Cosmote SWOT Analysis</i>	33
<i>Table 5 : Vodafone SWOT Analysis</i>	38
<i>Table 6 : TIM SWOT Analysis</i>	44
<i>Table 7 : Q-TELECOM SWOT Analysis</i>	48

LIST OF FIGURES

<i>Figure 1: The interwoven value network and value chain (Kothandaraman and Wilson, 2001)</i>	8
<i>Figure 2: market share 2004 (http://www.okosmostouependyth.gr)</i>	23
<i>Figure 3: The mobile market in Greece – 2004 (http://www.okosmostouependyth.gr)</i>	24
<i>Figure 4: ARPU: Greece, 2004(http://www.okosmostouependyth.gr)</i>	25
<i>Figure 5: revenues per category: Greek operators: 2003 (http://www.okosmostouependyth.gr)</i>	27
<i>Figure 6: From Marconi to 4G: technologies, markets and innovation (Steinbock, 2003).</i>	52
<i>Figure 7: Loss of fixed access traffic to mobile as % of total potential fixed access traffic (Beardsley et al., 2002)</i>	74
<i>Figure 8: Core Clusters (Steinbock, 2003)</i>	75
<i>Figure 9: Users of Mobile Phones, 2001 -2004 (E.D.E.T. – http://www.e-businessforum.gr)</i>	76
<i>Figure 10: Telecom services around the world, 2004-2009 (IDATE, 2006)</i>	77
<i>Figure 11: Forecasts for fixed, mobile and broadband subscriber bases, 2005-2009 (IDATE, 2006)</i>	77
<i>Figure 12: Growth of the world telecom services market in 2004 and 2005 (IDATE, 2006)</i>	78
<i>Figure 13: world telecom services market, 2001-2005 (IDATE 2006)</i>	79
<i>Figure 14: world telecom services market, 2001-2005 (IDATE 2006)</i>	80

INTRODUCTION

A revolution is taking place in the **telecommunications industry** worldwide. In an emerging global economy the ability of the telecommunications sector to provide an internationally competitive network for transferring information has significant implications for trade and economic growth. Efficient delivery of telecommunications services generates direct benefits through lower transaction costs and improved marketing information (Madden and Savage, 2000). The past 20 years have seen the worldwide telecommunications industry transformed from predominantly dormant, country-centred, government-run service providers, to increasingly competitive, innovative and market-led organizations (Lal et al., 2001).

The telecommunications industry is undergoing a radical transformation, creating exciting new opportunities and new challenges for infrastructure and service providers. The established value chain is being deconstructed with the entry of powerful new players and restructuring of the industry. Rapid **technological developments** and increasing **market turbulence** have added new dimensions to an already complex scenario. As a result, many tested business models, as well as frameworks and techniques have become obsolete. In this changing environment, all players need to re-evaluate their strategies and market positions and make hard decisions as to where to go next.

In this “**new telecommunications industry**”, value chains are evolving into value networks. An industry-level value chain serves as a model of the industry whereby processes are considered independent of the firms that may or may not engage in them. This separation enables vertical integrations or cooperative agreements (alliances, joint ventures, etc.) in the overall industry. But, dynamic forces in the course of production are ignored and the model implies that product and service development is necessarily a sequential process. This has led to the development of an alternative conceptualization, the value network (Maitland et al., 2002). The “**value net**” or “value creating network” concept as proposed by Kothandaraman and Wilson (2001) posits that network formation is based upon an assessment of potential partners’ abilities to add significant value to the market offering while presenting low risk and superior management. The above mentioned value network consists of a

series of inter-twined value chains with multiple entry and exit points, as it can be seen in figure 1.

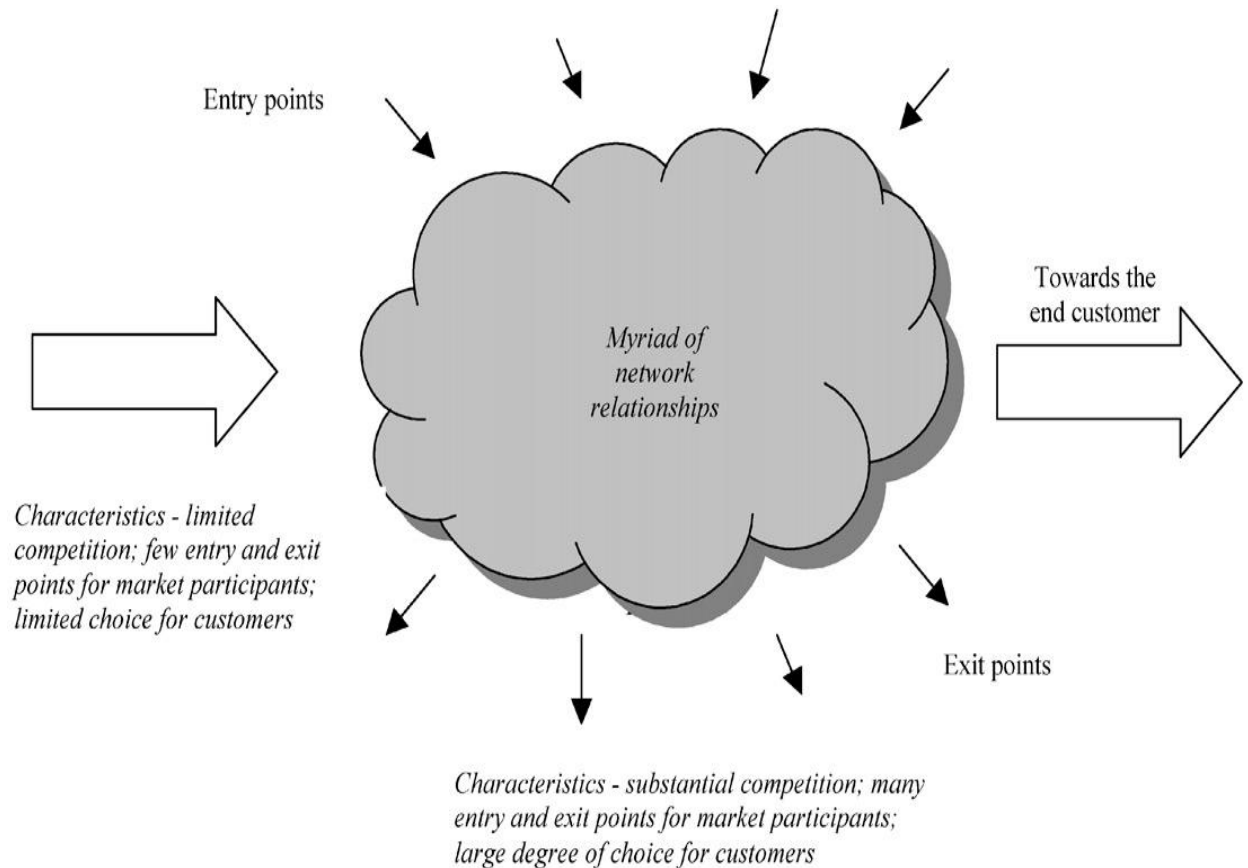


Figure -1: The interwoven value network and value chain (Kothandaraman and Wilson, 2001).

The industry is no longer characterized by a series of close and long term relationships between a handful of network operators and equipment manufacturers. Instead, relationships between players are more fluid. Moreover, new entrances into the market are taking place – and the most important - with the latest technology that is cost effective and supports the most advanced services. These have provided new entrants with a competitive advantage over incumbent players (Li and Whalley, 2002).

On the other hand, **Internet technologies** have given rise to new markets and drawn players from other industries into the fray. These new markets – such as web hosting, ISPs, browsers – have provided opportunities for initially innovative new companies. Internet technologies have also enabled the telecommunications industry

to converge with other industries. Therefore, there is great possibility for new value chain linkages. The “era” of u-health, according to which tiny mobile devices could help diagnose or monitor patients remotely without need for travel or surgery, as already does mobile video conferencing, is not too far away. Similarly, we might talk about u-inventory (tiny radio tags track inventory and check access control, while linked to global databases) and u-safety (location-based technologies, which keep small vulnerable out of harm’s way and help in disasters and emergencies), too (Srivastava, L., 2005).

The fastest expanding segment - in this new “telecommunications era” - is the **mobile telecoms industry**. With more than 2 billion subscribers worldwide at the end of 2005, mobile telephony has become the most popular telecommunications access mode, well ahead of landline calling and its base of 1.2 billion fixed main lines. Mobile services now constitute operators’ prime source of revenues: earnings for 2005 are estimated at **573 billion USD**, or half of the globe’s telecommunications services market (APPENDIX D). Sales exceeded 770 million units this past year, representing an estimated 95 billion USD (40% of the telecom equipment market) (ENTER and IDATE, 2006). In the space of a decade, the mobile sector has moved through the ranks to occupy centre stage in the telecom world, despite which the coming months will undoubtedly offer up an number of challenges:

- At the **technological level**, with the transition to 3G and the evolution to HSPDA and still other fixed wireless networks like WiMAX, which are potentially both competitors for and complementary with cellular networks.
- At the **industrial level**, with a subscriber base that could grow to 3 billion users around the globe by 2010, and a handset market that is expected to remain healthy for several years to come
- At the **consumption level**, with the increasing prevalence of non-voice applications, which are being enabled by the networks’ ability to carry increasingly heavy content (e.g. mobile T.V.), even if voice APRU (Average Revenue Per User) is still the prime source of earnings
- At the **regulatory level**, with the imposition of tariff restrictions, particularly in wholesale markets (call termination fees, roaming).

In the E.U. the telecommunications industry employs – in total - over 900,000 people, has a combined turnover of US\$220bn, and accounts for around 3 per cent of Europe’s GDP (Dabler et al., 2002). Similarly, the fastest expanding segment in the

European telecommunications industry is **mobile telecoms industry**. By the end of 2001, this market was expected to account for 38% of the combined EU telecommunications markets in terms of revenue. An important reason for the positive development in Europe for the last years is of course the rapid development of product features and new product designs. About 30 per cent of the mobile phones sold in June have Bluetooth functionality, MP3 is already included in more than 20 percent of the GSM products currently sold and 95 percent of the 3G phones sold have MP3 or similar technology on board (<http://www.inatelecom.org>). But, the impact of 3G products is only slowly increasing. And reports indicate that the fastest growth in mobile phones takes place now in East Europe rather than the Western Europe, where the market reported a growth of 15 percent during 2005, compared to 17 percent growth in 2003 and 2004.

Greece has a rather big rate of growth. The number of Greek users has increased during 2004, compared to 2003, according to an official national research conducted by E.D.E.T. (APPENDIX C). Mobile telephony in Greece contributes 2,2% to the GDP, serves approximately 10 million citizens and employs 30,000 people. But what is very important is the fact that mobile phones have now become **affective technologies**, meaning that they are very important for their users who feel attached to them.

The truth is that nowadays, mobile phones are objects, which mediate the expression, display, experience and communication of feelings and emotions. Emotional attachment is enacted in the personalization of handheld devices and services. Mobile phones are not only an extension of the owner's presence, but they also allow the virtual presence of those linked to us by phone communication. Thus, they become an important element in the building and maintaining of groups and communities.

A combination of competitive markets, private ownership and foreign investment has created an environment in Greece for rapid growth. The industry has responded to rampant demand such that mobile phone service has become a mass market commodity. The Greek market includes now four players: **Cosmote**, **Vodafone**, **TIM** and **Q-Telecom**. The competition among them is intense. They struggle for the highest market share in the terms of best services, best products, best network and the best brand name in the consumers' minds. The bet for them is which firm can gain **competitive advantage** and sustain it throughout the years passing.

The first step in forecasting the strategies that the above companies will implement in order to gain this competitive advantage, is to recognize the political, economic, social and technological environment, in which they operate. A useful tool is *PEST analysis* of the current characteristics both of the Greek and European market.

The second step is the evaluation of the internal features and the structure of each of the above mentioned Greek companies, by making a *S.W.O.T. analysis*. It is very important, because it will be the base on which their future strategy will be designed.

But, the Greek mobile telecoms industry is part of the international mobile phone industry and many of its activities are affected by the international developments. The world around telecommunications and more specifically, around mobile phones, is constantly changing. For that reason, it is appropriate to examine the *international trends* that may influence both in the present time and in the future the Greek mobile telecoms industry.

And the aim of this project is implemented with the *forecasting of the strategies* the four mobile phone companies in Greece will apply in the future, in order to satisfy their objectives and to gain a competitive advantage. Such a try will be based on three scenarios that might occur in the Greek market, which could found the strategies that might be adopted.

Part 1 The external environment of the Industry

1.1 POLITICAL/LEGAL FACTORS

The new **laws 3431/2006 and 3471/2006** transpose the EU Telecom Package of 2002 into the Greek legal system and compose the Greek framework about telecommunications. Additionally to that laws, there is **E.E.T.T.** (the National Telecommunications and Postmaster Commission, the National Regulatory Authority on telecommunications and posts) and the **Ministry of Transportation and Communications**, which set the rules under which the Greek mobile telecoms industry operates. And since Greece is member of E.U., it is inevitable that there are many effects on Greek telecommunications by the European regulations.

Telecommunications is one of the most dynamic sectors of the European economy. As wealth and income increase, so does the desire and ability to communicate with others (Keating, 2001). In this environment, in March 2000 the Lisbon European Council set a new objective for the European Union for the next decade: to become the most competitive and dynamic knowledge-based economy in the world. One of the prerequisites for this, is a fully integrated and liberalized telecommunications market. This can be achieved by the rapid adoption of the new telecommunications regulatory framework.

The most important features of the telecommunication factor total transformation in Europe are (Xiros and Emiri, 2003):

1. The telecommunications services liberalization and the networks liberalization
2. The alternative supply activity
3. The market opening to competition
4. The state or semi-state telecommunication organizations privatization and
5. The rapid development of the satellite and personal type of communication

Intending to the creation of an internal market that will supply telecommunicative services, through the creation of an open network, which will supply general services in a rally competitive environment, E.U. set six communal directives, which compose the new regulatory framework. These are (Kiki, 2003):

1. **Directive 2002/19/EC** of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (*Access Directive*).
2. **Directive 2002/20/EC** of the European Parliament and of the Council of 7 March 2002 on the authorization of electronic communications networks and services (*Authorization Directive*).
3. **Directive 2002/21/EC** of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (*Framework Directive*).
4. **Directive 2002/22/EC** of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (*Universal Service Directive*).
5. **Directive 2002/58/EC** of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (*Directive on privacy and electronic communications*).
6. **Directive 2002/77/EC** of 16 September 2002 on competition in the markets for electronic communication networks and services.

According to the above Directives, if one country's – member National Regulatory Authority (**N.R.A.**), like E.E.T.T. in Greece, ascertains that one telecommunications industry does not operate under the conditions of competition, has the authority to impose the rules that the European Directives regulate about Universal Access. In other words, N.R.As play a central role in the implementation of the telecommunications framework.

The new legal framework must be implemented fully and effectively in the Member States, which had until 24 July 2003 to incorporate the European Directives into their national legislation. **Greece has recently (in 2006) incorporated all the above Directives** (2002/19, 2002/20, 2002/21, 2002/22 and 2002/77) in the Greek legislation, with the **laws 3431/2006 and 3471/2006** (<http://lawdb.intrasoftnet.com>).

The new framework in Greece has radical affected the operation of the Telecoms industry. There is de-regulation now, which has brought about significant changes. After the demise of the former state monopolies there is now increased competition in the market. New suppliers want to gain customers with new pricing

structures (Kollmann, 2000). More practically, the Mobile Telecoms Industry in Greece has to adjust its structure and its activities (products and services that they offer) to the terms that the new law has set, otherwise it will have to pay financial penalties and fall into decline.

Specifically, the law 3431/2006 is the one and only major regulator of telecommunications in Greece and sets the rules for the providing of **General and Specific licences** for the acquisition of telecommunication networks. One mobile phone company can acquire a General license 15 days after it has lay down to E.E.T.T. a Registration Report. Specific licenses are provided by E.E.T.T. for the creation of telecommunication networks. The most important – though – for the Mobile Telecoms Industry, are the 2G and 3G licenses, which are provided by E.E.T.T., too. E.E.T.T. in 2002 has announced competition/**auction** for the conferment of EGSM spectrum for 2G mobile services and previously, in 2001, has announced competition for Specific license for 3G mobile services.

At the same time, the law 3431/2006 regulates the operation of **E.E.T.T.**, the Greek NRA. E.E.T.T. is authorized to take care of everything matters telecommunication products and services in Greece as well as to ascertain that the Greek telecommunications industry operates under the conditions of competition. It promotes the effective and healthy competition based on the principles of commercial equality, impartiality and transparency.

The evidence is that, recently, E.E.T.T. has imposed some financial obligations on Cosmote, Vodafone and TIM and “forced” Q-Telecom to keep control of its tariffs. Every company, which does not obey to those obligations, will face financial penalties. And another important for the Greek mobile telecoms industry is the fact that, in 15.3.2002. E.E.T.T. has recognized Cosmote and Vodafone as major mobile phone companies for the Greek market (SMP), with the rule to avoid discriminations in pricing and providing telecommunications services. Only in this way, competition provides pure conditions for every player in the Greek market.

1.2 ECONOMIC FACTORS

The liberalization of telecommunications markets in Europe has not only political effects on the Greek mobile telecoms industry but economic effects, too. The European industrial landscape has dramatically changed and former monopolies have lost large chunks of market share in data services and in long-distance and international telephone calls (Beardsley et al., 2002).

A central feature of the new landscape is the **increase of competition**. At one point of view, competition serves welfare and consumers better than the former state monopoly, both from a short-term perspective, where entry and investment decisions are taken as given, as well as from a long-term perspective, where these are treated as endogenous (Peitz, 2003). In a liberalized market regulatory policy focuses on the possibility that operators can access competition's networks and particular, that they can terminate calls on their competitors' network. It may also impose restrictions with respect to certain the incumbent's business practices that would make entry difficult in a way that is seen as anticompetitive. In a liberalized market, regulation should be applied carefully and cautiously so that it does not undermine incentives to innovate and to compete in the market. Rather it should stimulate competition both in the short and long term and protect consumers. Regulation promotes competition in the short term if, for given entry, the pressure on prices is increased and it promotes competition in the long term if entry into the market is facilitated (Peitz, 2003).

Competition in European telecommunications landscape is affected by **mergers and acquisitions**, too. The takeover of Telecom Italia by Olivetti in 1999 and of Mannesmann by Vodafone in 2000, are examples of such changes (Trillas, 2002). These important changes in the environment of telecommunications firms change industry boundaries and the optimal scale and scope of activities (Laffont and Tirole, 2000). Takeovers, privatization and regulation or deregulation interact in determining the ownership structure of telecommunications firms and the industry structure of the whole sector. Lehn (2001) has shown that deregulation increases the marginal productivity of the managerial function, which has the effect of increasing the optimal stake of large stakeholders in the firm, because with deregulation blockholders can better appropriate the results of their monitoring activities. This results in

an increasing frequency of takeovers, as one of the mechanisms to implement this more concentrated ownership structure.

Although the telecommunications industry has shown healthy signs of development, over the past couple of years, has become notorious for fraud, bankruptcy, debt and destruction of shareholder value, too. Exactly how much money has gone down the telecoms drain is hard to quantify, but many estimates hover around the \$1 trillion mark. Dozens of firms have gone bankrupt, including Global Crossing, 360networks, Williams Communications, Viatel and WorldCom. Hundreds of thousands of workers in the industry and particularly at telecoms-equipment makers, have lost their jobs. The cause of that decline in telecoms sector is that although the industry has continued to grow, it has not done so in the manner, and above all not to the extent, that those in the industry expected. Telecoms is an **infrastructure - intensive** business, and because infrastructure takes a long time to build, telecoms firms have to make bets on the level and nature of future demand. As it turned out, the bets made during the technology bubble of the late 1990s were spectacularly wide of the mark (Economist Survey on Telecoms, 2003). Particularly, in the past couple of years, telecoms operators have concentrated on restructuring debt, cutting costs, retrenching in their home markets, backing out of bad investments, cleaning up balance sheets and trying to hold on to their customers. New management has been installed almost everywhere. But although operators may have done a good cutting costs, they can not save their way to success.

The best opportunity lies on the continuing rise of mobile phones. But the main problem in E.U. is that regulators continue to view mobile and fixed access as separate, not competing, markets. In other words, fixed-line providers are regarded as competing only among themselves, not with mobile operators or with other infrastructures and services. And people in Europe are more and more inclined to use mobile rather than fixed-line telephones, to the point that some users are canceling their fixed-line service altogether. In Europe, the amount of residential traffic that has shifted from fixed lines to mobile networks ranges from 6 percent to more than 50 percent (Beardsley et al., 2004) (APPENDIX A). But, this is not enough. The continued health of the mobile telecoms industry depends on being able to deliver data services alongside voice calls, revenues from which are flat or declining.

1.3 SOCIAL FACTORS

Today we stand witness to an age of technology that transforms everyday human life in countless ways. Telecommunications is the technological application that most influences the way people express themselves, conduct business, relate with one another and think. Mobile phones have become the commodity that contributes to that lifestyle.

In recent years, global mobile telephony has experienced spectacular demand growth that is unmatched by anything in the long history of fixed network-based telecommunications. The International Telecommunications Union estimates that, in 2002, the number of mobile cellular subscribers (over 1.15 billion worldwide) surpassed the number of fixed main lines in service (nearly 1.13 billion worldwide) for the first time (Banerjee, A. and Ros, A., 2004).

Region/country	Fixed main lines		Mobile subscribers	
	1995	2001	1995	2001
Africa	1.79	2.00	0.71	2.69
Americas	32.09	28.35	44.37	23.51
Canada/USA	25.72	20.11	40.11	14.99
Rest of Americas	6.36	8.25	4.27	8.92
Asia	26.36	37.39	25.48	35.66
Japan/Korea/Hong Kong/Singapore	12.42	10.00	15.94	11.80
Rest of Asia	13.94	27.40	9.53	23.85
Europe	38.18	31.08	26.55	36.70
OECD Countries	29.46	22.78	25.75	31.82
Rest of Europe	8.72	8.30	0.80	4.88
Oceania	1.59	1.18	2.89	1.11
World	100.00	100.00	100.00	100.00

Table 1 : Regional shares of fixed main lines and mobile subscribers, 1995 and 2001 (Banerjee, A. and Ros, A., 2004)

The first mobile services served niche markets and consisted of bulky and weighty handsets that were plagued by poor service quality, limited capacity and high prices. As a result, mobile services were viewed as luxury items and penetration rates remained low. But, during 1990s, telephony in many countries saw a pervasive transformation from monopoly to competitive provision of telecommunications

services. Such liberalization exposed value-added services like customer premise equipment, paging and mobile services to the workings of the competitive market.

Moreover, since liberalization, mobile telecoms industries have to perform some **social obligations**. For instance, quality services should be available at just, reasonable and affordable rates. Access to advanced telecommunications and information services should be provided in all regions, without exceptions for the low-income consumers and those in rural, insular and high-cost areas. Finally, all providers of telecommunications services should make an equitable and nondiscriminatory contribution to the preservation and advancement of universal service (Dyck, 2004). And all the above for the satisfaction of the consumers worldwide. Mobile telecoms industries follow their needs, wants and desires and seek to fulfill their expectations. Mobile phones have become essential part of social and private life, a trend, a useful tool for professionals and the industries need to keep up with those social changes.

Particularly, as in no other market, the growth of mobile telephony in Greece has been astronomical. Since the first call placed over the Telestet network in June 1993, the Greek public has embraced the mobile telephone as its own. Now, with more than 2 million customers, Greece is among the fastest growing markets in the world. Never was the cellular handset just a status symbol – but it was immediately put to use because the anytime, anywhere freedom of the service fit so perfectly the Greek lifestyle. Because of Greece's legendary Mediterranean climate and natural beauty, many Greeks choose to live out of doors. They also are entrepreneurial with a large segment of the population either self-employed or working for small businesses. They are people in motion and mobile phones are an opportunity for them to keep in touch – anytime, anywhere – enabled by the simple movement of the fingertips and, of course, the application of one's own personal creativity.

1.4 TECHNOLOGICAL FACTORS

As the decade of the 1990s drew to a close, there was a widespread sense that the rapid development of wireless communications pointed the way to the expansion of the Internet beyond its PC base. In Asia, Europe, and, to a lesser extent, in the U.S., plans began to be laid to roll out **mobile Internet** service networks.

The wireless market had experienced extreme growth in the last half of the 1990s. From 1994 to 1999, mobile phone sales had grown *tenfold*, from 26 million units to 278 million annually (Ratliff, 2002). Mobile communications providers in the developed world began to prepare for the next technological leap, from low-band, voice-only digital networks (Second Generation or 2G) to broadband mobile networks with a wide array of data services, such as streaming audio and video (Third Generation or 3G). And this seems to be the biggest technological change in mobile communications.

The Internet has created opportunities for many new entrants to participate in the telecom space. As a global network of networks, the Internet is a more economical means of transmitting voice, data and video than the proprietary networks. Moreover, it has open standards for communications, applications and services, making it possible for different companies to launch products that work together (Seaberg et al., 1997). As a result, customers are now free to choose different service components from different vendors and assemble their own solutions. Apart from that, Internet technologies have given rise to new markets and drawn players from other industries into the fray. These new markets – such as web hosting, ISPs, browsers – have provided opportunities for initially innovative new companies, and more recently, established companies to prosper (Li and Whalley, 2002). Internet technologies have also enabled the telecommunications industry to converge with other industries with the result that players in these other industries are now playing a prominent role. This prominence is based on the ability of companies, such as News Corporation, AOL Time Warner and Microsoft to provide services and content that is readily sought after by customers and which is, financially, more lucrative than the provision of traditional telecommunications services like voice and fax (Seaberg et al., 1997).

Europe and North America have taken divergent approaches to managing spectrum for wireless voice and data services, 2G and 3G bands. The European

Community has mandated a harmonized standard, **GSM**, in the 2G bands and has adopted Wideband CDMA (**WCDMA**) in the 3G bands. Such an initiative was very important and contributed to the creation of an unionized European market. CDMA uses coding schemes derived from the second-generation version of CDMA, also called CDMA-one. What is important, is that now CDMA2000 is intended to replace CDMA-one. CDMA2000 is a relatively simple upgrade of existing CDMA technology (Gandal et al., 2003). In contrast, the North American approach has been to allow the market to decide, that is, operators have been free to choose among the recognized four digital wireless standards for 2G: CDMA/IS-95, GSM, TDMA and IDEN (Gandal et al., 2003).

In Japan something extraordinary happened. In 1999, DoCoMo, the wireless subsidiary of Nippon Telephone and Telegraph, had rolled out i-mode, a modest, low-band mobile Internet service that had quickly become a huge success. NTT DoCoMo designed **i-mode** as a packet-switched network alongside its existing digital cellular network, which allowed a constant connection with the Internet and i-mode was the first commercial service of this kind in the world (Ratliff, 2002). By mid-2000, after less than eighteen months of operation, this service had attracted over 10,000,000 subscribers, utilizing their handsets for e-mail, retrieving information and even engaging in various forms of e-commerce. Since then, Japan remains the only country in the world where wireless Internet has firmly established itself. Mobile Internet is clearly enjoying a positive feedback loop effect as a rapidly expanding user base and steady increase in available content continue to spur each other.

On the international front, there were a lot of challenges for DoCoMo. Globally, the mobile Internet market was stagnant; in fact, it was estimated that i-mode subscribers alone accounted for as much as 30%-35% of the total global mobile Internet installed base. Moreover, there were significant differences between these markets and Japan and differences in consumer behavior. In Europe, mobile phones were even more prevalent than in Japan; some countries had over 70% penetration rates. But despite the ballyhooed introduction of WAP-based Internet services by a variety of European carriers, the wireless Internet had yet to catch on. As for the U.S., American consumers were less likely than Japanese consumers to use a cell phone, but more likely to access the Internet via a PC; they thus tended to be skeptical about the benefits of accessing the web via a two-inch screen. But, DoCoMo felt optimistic about all the above challenges and introduced i-mode to many European countries.

COSMOTE in Greece was one of the first mobile phone companies, which seems to follow DoCoMo's strategy as far as i-mode is concerned.

So, it becomes obvious that two parallel important technological phenomena had impact and continue to affect telecommunications: the growth of the Internet and mobile telephone services. The Internet brought the benefits of data communications to the masses with e-mail, the Web and e-commerce while mobile service has enabled "follow-me-anywhere/always on" telephony (Lehr and McKnight, 2003).

The outstanding question now is the possibility of carrying VoIP over to mobile networks. The stakes this represents for mobile operators are particularly high, given that 80% of their earnings are currently telephone based. The truth is that several technologies and networks have the capacity to enable mobile VoIP; 2.5 G and 3G cellular as well as Wi-Fi and WiMAX networks. The success of wireless VoIP will depend mainly on the rates charged for voice calls on 3G networks, on the availability of unlimited data packages, on the regulatory situation and on the availability and price of the hand-sets themselves (Wi-Fi and dual mode cellular/ Wi-Fi). In this scene, two business models for wVoIP would emerge: the first, developing initially in the United States and whose driving force will be independent Wi-Fi access networks, and later mobile operators, will resemble the internet model. The second model, which is likely the most common one in Europe and Japan in the coming years, involves wVoIP being "controlled" by mobile operators and incorporated into their rate plans.

Part 2 The internal environment of the Industry

2.1 S.W.O.T. analysis of the Greek mobile Telecoms Industry

The mobile telecoms industry is an intensively competitive industry. Every company's strengths and weaknesses will determine its ability to initiate or react to strategic moves and to deal with environmental or industrial opportunities or threats that might occur. That is the reason of the emergence of a S.W.O.T. analysis.

The Greek mobile telecoms industry, though, is a small market and includes four players, which more or less imitate each other in the implemented strategies and provide approximately the same operational services under different conditions and different charges.

Therefore, a **general S.W.O.T. analysis of the Greek mobile telecoms industry** could include:

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<ul style="list-style-type: none">• Wide range of products, services and tariff plans• Efficient networks, covering 99% of the population• Three major players have built strong brands.• Good financial performance, which covers the needs of the Greek population	<ul style="list-style-type: none">• Limited market for value-adding and data services• Interventions by foreign players• All market players follow technological developments, at different rates	<ul style="list-style-type: none">• Expansion in neighbor countries• Emerging fixed line substitution rates.• Increase income from value-added and data services by tailoring products / services to fulfill clients' needs.	<ul style="list-style-type: none">• Great competition and lack of differentiating strategies• Limited ability to innovate.• Limited room for growth in terms of subscribers in the Greek Market.• Regulatory effects on pricing, especially call termination and roaming charges

Table 2 : S.W.O.T. analysis

The general scene includes four players: **COSMOTE, VODAFONE, TIM and Q-TELECOM.**

The first three of them are considered to be the leaders, since Q-TELECOM follows a completely different strategy.

Therefore, the Greek mobile telecoms market has as follows:

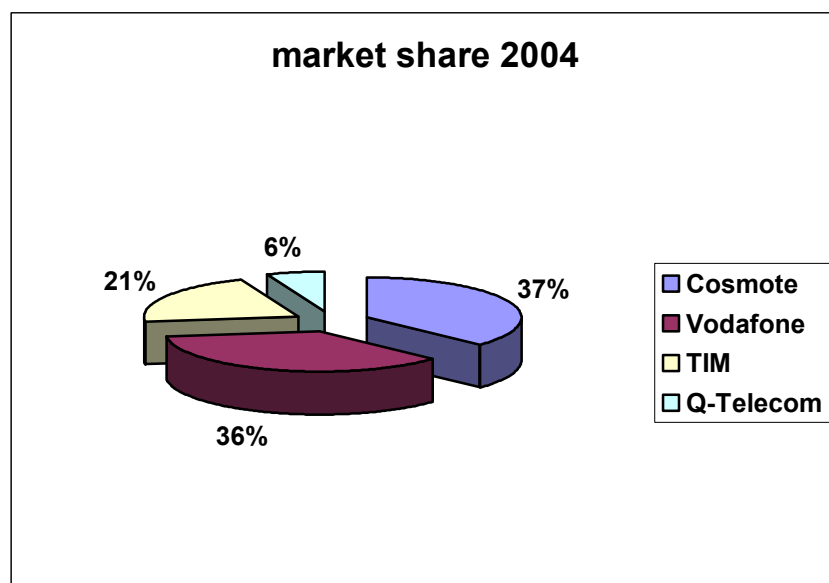


Figure -2: market share 2004 (<http://www.okosmostouependyth.gr>)

The mobile market in Greece-2004

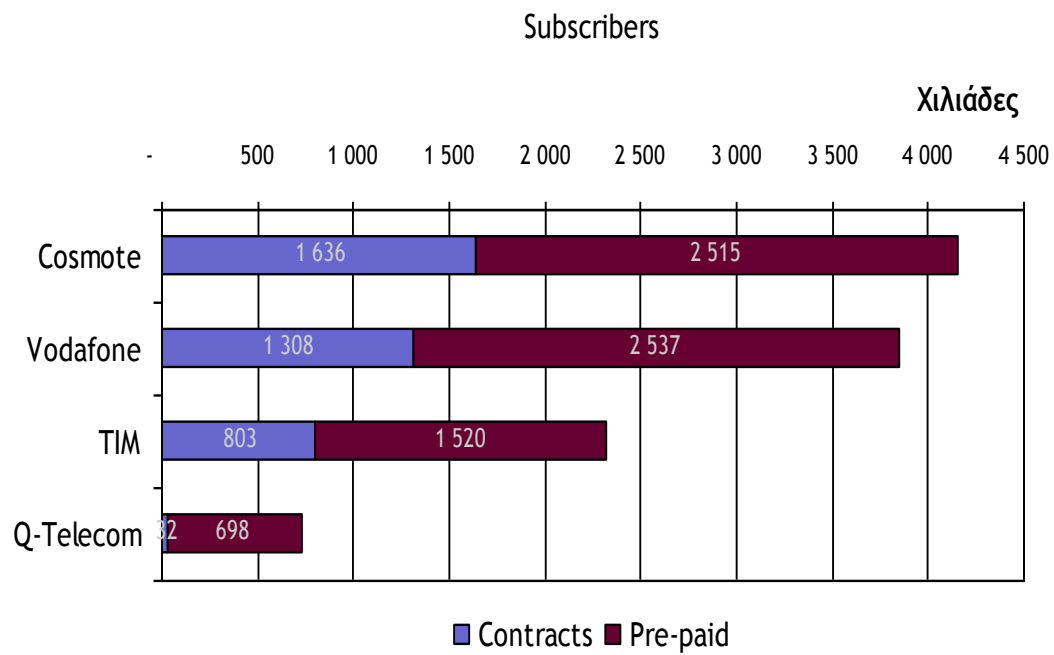


Figure-3: The mobile market in Greece – 2004 (<http://www.okosmostouependyth.gr>)

ARPU:Greece:2004

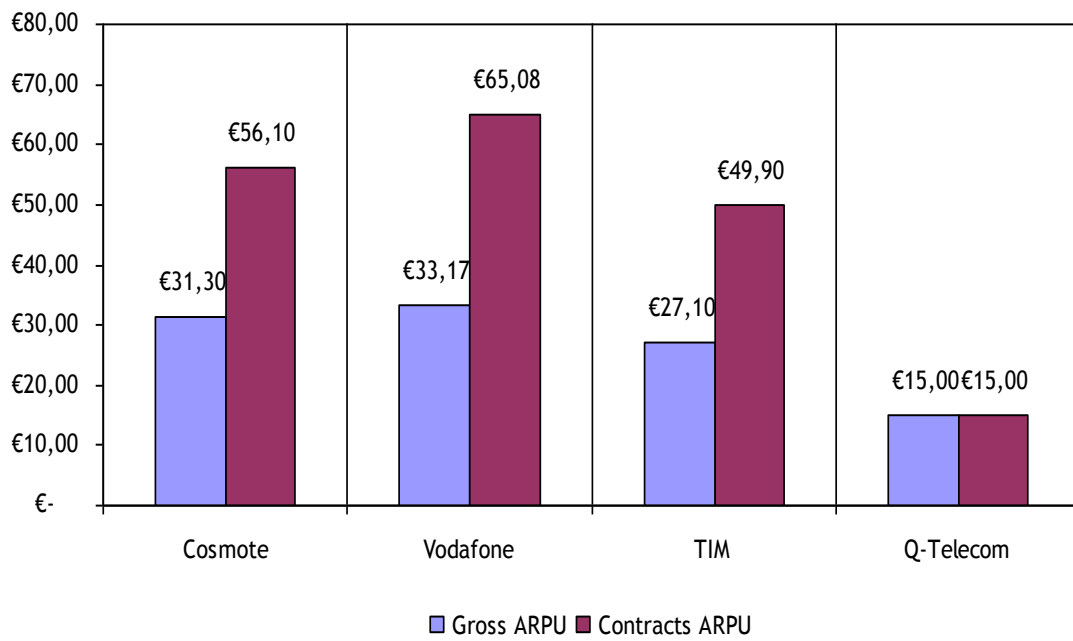


Figure -4: ARPU: Greece, 2004(<http://www.okosmostouependyth.gr>)

Breakdown of revenues, Greek market, 2002-2004				
		2002	2003	2004
Flat Fees	Cosmote	109000	180449	250639
	STET	80034	102281	132542
	Vodafone	134159	187468	260000
Airtime	Cosmote	237000	390562	431614
	STET	136184	164211	165231
	Vodafone	264433	364435	400000
Termination Calls (F)	Cosmote	177000	183937	174077
	STET	167932	123473	84423
	Vodafone	189728	182069	172000
Termination Calls (M)	Cosmote	160000	165398	216911
	STET	64556	119397	150807
	Vodafone	189728	182069	185000
Roaming	Cosmote	35000	40359	39448
	STET	42700	52000	55506
	Vodafone	45948	50848	48000
Pre-paid renewals+packages	Cosmote	232000	258033	285675
	STET	140269	153292	147296
	Vodafone	321270	354617	389000
Accessories/Phones	Cosmote	7900	13406	36350
	STET	23878	46606	43604
	Vodafone	93669	130747	357000
Other	Cosmote	11300	17116	16560
	STET	2771	4613	4431
	Vodafone	6510	8623	7600

Table 3 : Breakdown of revenues, Greek market, 2002-2004. Figures in thousand Euros. (source: company reports)

Revenues per Category: Greek Operators: 2003

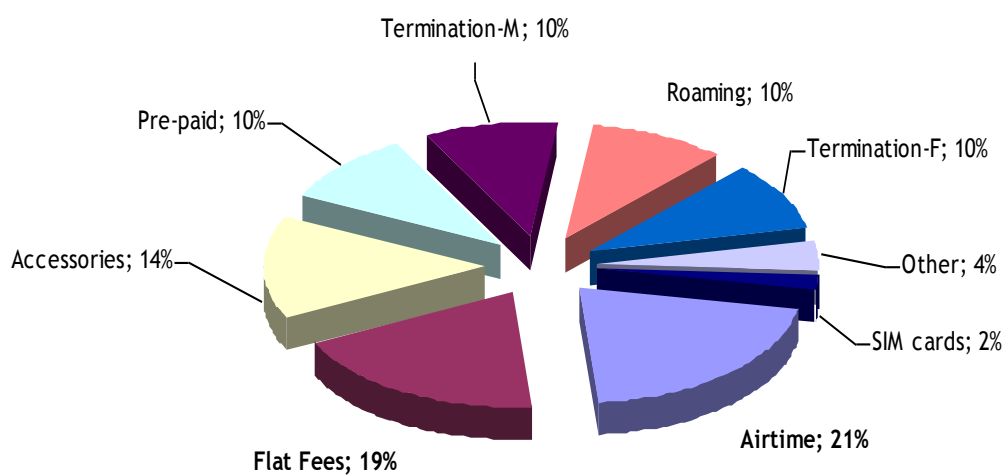


Figure 5 : revenues per category: Greek operators: 2003 (<http://www.okosmostouependyth.gr>)

2.2 S.W.O.T. analysis of Cosmote

Milestones (<http://www.cosmote.gr>):

1998: Cosmote starts to operate. The number of the customers reaches 300,000 and its market share is 14.5%.

1999: Cosmote covers with its net the 97% of Greece. Its market share increases and reaches 26%.

2000: In August, Cosmote expands its operations in Balkan and buys out the 85% shares of AMC (Albanian Mobile Communications Sh.a.) through its subsidiary “Cosmo-Holding Albania”.

2001: At the beginning of this year Cosmote installs GPRS everywhere in Greece. In June Cosmote seems to be the first mobile telecoms industry in Greece, with 2,52 million customers and 36,5% market share. In July, the company acquires 3G license (UMTS).

2002: OTE delegates to COSMOTE the LMDS license about fixed wireless access in 25 GHz. In September a new service is promoted: MMS. By the end of 2002, Cosmote has more than 3,506 million customers in Greece and AMC in Albania has 501 million customers with 59% market share. The total revenue of Cosmote exceeds 1.201 million euros.

2003: In January Cosmote undertakes the administration of GloBul and CosmoFon, which are members of OTE Group. In June CosmoFon starts to operate in Fyrom. In November 2003, a very important agreement takes place: Cosmote agrees to cooperate with NTT DoCoMo for the promoting of i-mode services (wireless Internet) in Greece.

2004: In June new i-mode services are introduced and users have access in more than 120 Greek and international i-mode sites. In August 2004, Cosmote is the Big National Sponsor of the Olympic Games in Athens and turns out to cover all the needs in the mobile telecoms industry. By the end of the year, Cosmote has 4,151 million customers in Greece and total revenue 1,587 million euros.

2005: O.T.E. and Cosmote agree about the buying out by Cosmote of GloBul’s and MTS HOLDING BV’s shares, which has the 100% of the shares of COSMOFON.

S.W.O.T. ANALYSIS:

STRENGTHS

- Cosmote has the **greatest market** share in Greece– by the end of 2004, the firm had 4,15 million customers and 37,6% market share – (<http://www.cosmote.gr>).
- One of its main strengths is that it is able to **provide qualitatively all mobile phone services**, such as services based on contracts or prepaid cards, text or multimedia messages (SMS and MMS), recognition of calls, video calling and video streaming, WAP services, SIM microbrowser, voice recognition and GPRS. But what seems to be the most innovative for the Greek market is the **i-mode**, the most popular wireless internet services in the world. Cosmote cooperated with the Japanese NTT DoCoMo, one of the biggest companies globally, and introduced in Greece the i-mode services. I-mode offers the most spread and easy access in numerous services and has more than 45,000,000 users in the world. Cosmote through i-mode provides access to many services, such as mobile-banking, tickets booking, mobile shopping and many ways of entertainment. In the same time, Cosmote introduced in the Greek market handsets with high technological characteristics, such as NEC and MITSUBISHI. The users have access in more than 155 sites and the number is increasing constantly. Finally, Cosmote is keen on offering new services based on i-mode, so as to make i-mode a commodity for the Greeks.
- The quality of the net and the geographic cover are crucial factors that determine the supply of mobile phone services. Cosmote has managed to create an extended net since December 2004, which covered **99,6%** of the Greek population, 94,3% of land and 96,8% of territorial waters (<http://www.cosmote.gr>). The structure of the net GSM 900/1800 is based on station bases (BTS), which are the junction in the communication between the handset of the user and the net. But the most important is that during 2004, Cosmote started to use 3G net (**UMTS**), which is based on 3G station bases (Node Bs) and covers more than 40% of the Greek population. The Company aims at the improvement of the frequency's spectrum that uses, adding more station bases and using new technologies such as Cell Splitting, Software Optimization, Frequency Reuse and Cell Sectoring. And what is very determined for the quality of the services and therefore for the users, is that Cosmote has created a control system, which “watches” on regular base the

performance of the net. The target is the full cover (100%) of the Greek population and the development of the 3G net and the Company has already started to work for it.

- The structure of the Company is well organized and contributes to the identification of the administrators objectives with those of the stakeholders. At the end of 2004 Cosmote had 2,101 personnel, with the majority of them working in the commercial sector (<http://www.cosmote.gr>). But the firm is **integrated** and there is collaboration between its departments so as to achieve higher performance. The aim is the allocation of duties and jurisdiction among the shareholders, the administrators and the members of the council. For that reason, Cosmote has enacted an Internal Operational Regulation, which settles the activities of the General Meeting of Shareholders, the Administrative Council, the Administrative Commission and the Control Commission. Everything works under rules and moreover the employees are protected by the Internal Personnel Regulation and the Collective Working Agreements.
- Apart from the others what is very important for a leader company is its communicating policy. Cosmote has managed to create a good identity, a **successful reputation** to its competitors and a nice image to the mind of its consumers not only in Greece but in Balkans, too. The company takes part in numerous activities about education, health issues and takes care of social matters, which rouse international feeling, cooperates with respectful global companies, such as the collaboration with NTT DoCoMo and organizes innovative advertising campaigns to promote its products. Advertisements are considered to be a direct way to communicate with consumers and that is the reason why Cosmote tries to inform the public about its new services, such as i-mode, and aims at the establishment in the consumers' minds of an image that includes an innovative company, with flexible products and dreams for the future – Cosmote's slogan is “going forward” -. The Company uses indirect ways of communication, too. The most important of all, is the **Olympic sponsorship of Athens 2004**. During the Olympic Games Cosmote exclusively provided “live” information and official results of all the games, through MyCosmos, SMS, MMS, video streaming and i-mode. In this way Cosmote is now identified with the Olympic values, worldwide.

WEAKNESSES

- The Company has weak distribution system. There are **only 19 central stores**, which sell exclusively Cosmote products : 11 in Athens, 3 in Thessalonica, 1 in Irakleion, 1 in Volos, 1 in Larissa, 1 in Ioannina and 1 in Patra (<http://www.cosmote.gr>). The above stores provide all the products and the services to the customers but they are in the least and they are located only in 7 central towns and they can not serve the majority of the Greek population. Of course, Cosmote has a distribution net, which consists of 6 exclusive distributors, 2 inexclusive and 5 smaller distributors. But, they are responsible only for the making of the contracts and the promotion of COSMOKARTA and WHAT'S UP products.
- **O.T.E.** the biggest Greek fixed phone industry has the 64,37% of the shares in Cosmote. And in O.T.E. the Greek government has the 34,64% of its shares. This has negative effects in the operation of Cosmote. First of all, the Greek government intervenes and many times plays a significant role and determines many decisions that are taken by O.T.E. As a result, Cosmote is vulnerable to political interventions. Finally, when it comes for political interventions, bureaucracy is inevitable. Many decisions taken by the administrative council of Cosmote are taken slowly and with difficulty.

OPPORTUNITIES

- The major opportunity for Cosmote seems to be the **expansion** of its operations in South Europe and more specifically **in Balkans**. Cosmote has already bought out the 85% of the Albanian AMC in 2000, the 100% of the Bulgarian GloBul in 2003 and COSMOFON, a mobile telecoms industry in F.Y.R.O.M. (<http://www.cosmote.gr>). All the above companies seem to improve their performance as time passes by. AMC in Albania has already license for 3G services, 51% market share and 40% penetration in the mobile telecoms industry of the country. GloBul in Bulgaria is the most successful mobile telecoms industry and its profits increase constantly. Finally, COSMOFON in F.Y.R.O.M. has 23,5 million euros annual profits and improves its financial performance more, since the liberalization of the market in 1.1.2005. But, Cosmote does not stay stable. On the contrary, it expands in operations in Rumania during 2005 and

its plans include entrance in all Balkanian markets, where the mobile telecoms industry is at its first stage.

- Finally, what seems to be a challenge and an opportunity – though – for Cosmote is the technological development. The telecommunications sector presents great growth worldwide with the mobile telecoms industry to be the sector with the best future. New services and new products are promoted constantly and come to cover the needs, wants and desires of the consumers. **I-mode** is a challenge for Cosmote and opens new perspectives in 3G mobile phones. The future is bright as new innovative ideas create new high-tech products and services.

THREATS

- The biggest threat – not only for Cosmote, though, but for the other mobile telecoms industries, too – is competition. Although Cosmote's market share increases year to year and Cosmote remains the leader company in Greece, **Vodafone** follows with high market share, too. While in 2004, Cosmote had 4,151,347 million costumers, at the same time Vodafone had 3,845,000 million costumers in Greece (<http://www.cosmote.gr>). The difference between them is minimal. Apart from that, at this time (Autumn 2005) a very important merger is about to happen, which could change the things in the Greek mobile telecoms industry. Competition does not only come from the leaders but from the last ones in market share, too. Moreover, Cosmote needs to face up with European competition. There are great mobile telecoms industries in Europe, which determine the future of mobile phones, the offered services and the prices. In this constantly changing environment Cosmote has to study the structure and the strategic movements of its competitors and detect their weaknesses in order to maintain its competitive advantage.

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Market leader. • Supported by OTE, its major shareholder, the incumbent fixed telecoms provider in Greece. • i-mode • Well organized internal structure • Effective communications / PR / corporate responsibility 	<ul style="list-style-type: none"> • Weak distribution system • Political interventions • Lower ARPU than Vodafone. 	<ul style="list-style-type: none"> • Expansion in SE European Markets • Technological development 	<ul style="list-style-type: none"> • Great competition

Table 4 : Cosmote SWOT Analysis

2.3 S.W.O.T. analysis of Vodafone

Milestones (<http://www.vodafone.gr>):

1992: Panafon acquires GSM license

1993: The GSM network starts to operate

1996: Panafon wins quality guaranty, ISO 9001

1997: Panafon introduces the prepaid-service, which gathers 500.000 subscribers already.

2000: There is an announcement about the intention of merger between Vodafone-Panafon and Unifon & Panafon.

2001: Panafon acquires GSM license in Albania. Later this year Vodafone in Albania starts its operations. In April the above mentioned merger is approved by the Councils of the two companies. Finally, in July Panafon acquires 3G license.

2002: The brandname changes and Panafon becomes Vodafone. Vodafone provides for the first time in the Greek market the service of sending MMS (Multimedia Messaging Service).

2003: Vodafone introduces an innovative menu of services, Vodafone live!. In February there is an agreement with Germanos about the distribution of Vodafone products and services through the 300 Germanos stores. In December, Vodafone Group Plc. announces its willing to buy 136,944,800 shares of Vodafone-Panafon.

2004: Vodafone in Greece is awarded for its campaigns for the protection of the environment.

S.W.O.T. ANALYSIS:

STRENGTHS

- Vodafone has existed for 11 years in the Greek market and is considered to be a leader in the Greek mobile telecoms industry. What is very important for this successful performance is the fact that Vodafone is member of Vodafone Group, the biggest mobile telecoms industry in the world, which has subsidiaries in 39 countries in 5 continents, 60,000 employees and 139,000,000 customers. Vodafone has **37% market share** in Greece after the 40% of Cosmote

(<http://www.vodafone.gr>). Its main objective is the continuous improvement of the composition and the quality of the contract services as well as the increase in profits by offering new high-tech services. Its financial performance during 2004 was impressive. The Company had **17,3% growth** in its annual profits, which reached the €1,473,3 m. Finally, Vodafone has the first place in contracts in the Greek market with over **3,678,208 customers and maintains the highest ARPU**.

- Vodafone in order to be able to provide high-tech services, has realized many important investments. The most significant seems to be the mobile phone net. In 2001, Vodafone had acquired **GSM900, GSM1800 and UMTS (3G) spectrums**. Additionally, in March 2001 it was the first company in Greece, which provided services through **GPRS**, meaning that data can be transferred with 100kbps speed (<http://www.vodafone.gr>). The Company's net expands in over 7,000 km in Greece and covers its needs. Moreover, Vodafone has developed **optical backbone**, which connects the biggest Greek towns and satisfies their needs.
- Vodafone drives the technological developments in mobile phones in Greece and always seeks to provide innovative, flexible and high-tech products and services. The company is focused on its customers and satisfies both contract and pre-paid (with Vodafone a la carte and Vodafone CU) needs of the customers. Furthermore, Vodafone provided something innovative to the Greek market, **Vodafone live!**, which is a menu of services that ensures advanced communication between the users with color, sound, view and direct and easy access to various data. Vodafone live! proved to be a very successful initiative, has already 273,911 subscribers and adds value to the services provided by Vodafone in Greece (<http://www.vodafone.gr>). In the same time, Vodafone has a very good place, when it comes for business-customers. The Company has introduced Vodafone Mobile Connect Card, a useful service, which offers quick and reliable access to the Internet and to the e-mail of the businesses that use it.
- Vodafone's distribution network is efficient, too. The Company has over **200 dealers** of its products and services in Greece with the brandname Vodafone (<http://www.vodafone.gr>). And what is very important about this Vodafone chain, is that the focus is only on customers satisfaction. Customers, in every distribution spot, have the chance to use the products in order to have a first personal

experience before buying them. Only in this way, high personalization of the stores is achieved and customers can feel satisfied.

- Finally, Vodafone takes many initiatives in the social sector, organizing and implementing campaigns for the children and the environment. This corporate social responsibility is very important for the company's brandname and builds a good image in the consumers' mind.

WEAKNESSES

- Vodafone-Panafon in Greece although was found in 1992 with the brandname PANAFON and the participation of Vodafone Group Plc., France Telecom, Intracom and Data Bank, is nowadays member of Vodafone Group Plc., which has the 99,4% of its shares (<http://www.vodafonegroup.com>). Vodafone Group Plc. is the most powerful mobile telecoms industry in the world, with high financial performance, advanced products and services and efficient marketing strategy. Vodafone-Panafon in Greece follows and implements Vodafone's Group Plc. strategy both in internal and external performance and this many times might mean **no adjustment** to the Greek market. Vodafone's greatest competitor in Greece is a Greek company, Cosmote and not an international one, which has gained consumers' trust and faith. Although Vodafone introduces and provides constantly innovative products, advanced services and effective customer service, many times it is difficult for the Company to adjust to the Greek reality.

OPPORTUNITIES

- Vodafone-Panafon in Greece is member of Vodafone Group Plc., one of the world's most successful mobile telecoms industries. **Vodafone Group Plc** provides an extensive range of mobile telecommunications services, including voice and data communications and is the world's largest mobile telecommunications company, with a significant presence in Continental Europe, the United Kingdom, the United States and the Far East through the Company's subsidiary undertakings, associated undertakings and investments. All the subsidiaries operate under the brandname "Vodafone" except from the Group's associated undertaking in the United States, which operates as "Verizon Wireless". During the last two financial years, the Group has also entered into arrangements with network operators in countries where the Group does not hold

an equity stake. Under the terms of these Partner Network Agreements, the Group and its partner networks cooperate in the development and marketing of global services under dual brand logos. At 31 March 2005, the Group had approximately 154.8 million customers, excluding paging customers. The Company had a total market capitalization of approximately £93.7 billion at 12 November 2004 (<http://www.vodafonegroup.com>). It can be understood from the above that Vodafone Group Plc. is a strong brandname worldwide. Vodafone – Panafon in Greece can expand this common branding and take advantage of this brandname, which provides with reliability Vodafone’s products and services. Vodafone has the advantage in Greece of no need to convince the consumers of the quality of the offered services, since they have already identified in their minds Vodafone – Panafon with advanced products and services.

- Technological development seems to be an opportunity for Vodafone to expand its products and services, too. And this can be an easy thing for Vodafone, which has access to all the new technology the Vodafone Group uses and can take advantage of it. Recently the bet, which mobile telecoms industries have to win, is **third generation** mobile telephony. Vodafone has already acquired 3G license and should now focus on the promotion of advanced and cheap 3G services. Customers seem to respond positively to those new high-tech services and it is up to Vodafone to make them loyal users of the 3G mobile phones.

THREATS

- The major threat for Vodafone comes from the player in the Greek mobile telecoms industry, which will follow a strategy based on **cost differentiation**. Vodafone provides qualitative products and services and moreover has a successful brandname to serve with all its activities. The cost of those operations is relatively high and can not fall beyond a specific level. If one company in the Greek market, operates with lower cost and therefore provides cheaper products and services, then the competition will increase for Vodafone and may have negative effects on its profits.

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • High market share • Highest ARPU in contracts. • A global brand name. • Advanced net • High-tech products and services • Effective distribution channels • Corporate social responsibility • Leverages Vodafone Plc R&D and service development efforts. 	<ul style="list-style-type: none"> • Difficult adjustment to the Greek market • Minimal revenues from value-added services and data services 	<ul style="list-style-type: none"> • Expansion of Vodafone-Group's successful brandname in Greece • Access to Vodafone-Group's high technology • Rapid introduction of new services, part of Vodafone Groups global R&D. 	<ul style="list-style-type: none"> • Competition on price only

Table 5 : Vodafone SWOT Analysis

2.4 S.W.O.T. analysis of TIM

Milestones (<http://www.tim.gr>):

1992: TIM HELLAS is the first mobile telecoms industry in Greece, which has license for GSM. Such an investment was one of the most expensive in Greece and cost 30 billion draxmas.

1993: The company starts to operate with the brandname “TELESTET” .

1994: TELESTET introduces the Roaming system with Australia, Hong-Kong and S.Africa.

1995: TELESTET introduces the SMS service to its customers.

1997: In May a prepaid service is available by TELESTET: B free.

1998: TIM HELLAS is the first Greek mobile telecoms industry, which enters NASDAQ stock market in New York and Amsterdam’s stock market, too.

1999: TELESTET reduces the tariffs in prepaid services and has the cheaper prepaid package.

2000: TELESTET and a publisher “IMAKO A.E.” cooperate with “POWERNET A.E.” in the development of WAP services through mobile phones.

2001: TIM HELLAS is the first telecommunications industry in Greece that has acquired ISO 9001: 2000.

2002: TELESTET offers the opportunity of sending MMS.

2003: The company promotes various new services through taking part in many social activities and advertisement campaigns.

2004: It is a very important year for TELESTET. Its brandname becomes TIM and the company is bought out by Telecom Italia Mobile, which is member of the telecommunications group Telecom Italia and by Freemove, which consists of Orange (in Great Britain), Telefonica Mobiles (in Spain) and T-Mobile (in Germany) and is considered to be the biggest telecommunications alliance in Europe.

2005: TIM International N.V., which is subsidiary of TIM (Telecom Italia Mobile) sells the 80,87% of its shares to TIM HELLAS for €1,114.1 m.

2006: TIM Hellas acquires Q-Telecom for €350m.

S.W.O.T. ANALYSIS:

STRENGTHS

- The recent re-branding from TELESTET to TIM was a strategic movement that was meant to introduce to the Greek market a well-established and internationally recognized brandname and which enables STET Hellas to improve its performance in order to keep up with the European mobile landscape. Since then, TIM focused on extending its distribution channel and now has one of the most efficient distribution system. The Company has its own **distribution chain** of TIM stores as well as presence in non-traditional points of sale. By the end of 2003 there were **160 TIM stores** (<http://www.tim.gr>). The goal is to establish an integrated offer with a one-stop approach by offering in addition to sales, integrated services and customer support, act as an “educational” agent for 3G services. STET Hellas’ aim towards further penetrating alternative distribution channels was met through enriching its commercial agreement with the Hellenic Postal Service, making the company’s contract products the only ones available in over 700 postal offices throughout Greece, as well as by commencing a cooperation with agreement with EFG Eurobank Ergasias S.A.- one of the largest banks in Greece, extending sales of both contract and prepaid products to the bank’s credit card holders. More than expanding its distribution channel, STET Hellas gives value to the services offered in all of its distribution points. Various services are introduced to support a wide variety of business functions (e.g. customer electronic cancellation, contract request, change of SIM cards, payments and Point-of-Sale Inventory monitoring for contract customers handset upgrade). Regarding 3G billing, STET Hellas successfully implemented a state-of-the-art UMTS billing system – in line with Telecom Italia Mobile’s strategy and aiming at increasing synergies with the Telecom Italia group. Another major project in the area of billing was the launch of an advanced Billing System based on XML technology, whose introduction makes it possible to personalize and change the bill layout on demand. All the above services are available in all the stores and are of critical importance in serving existing or potential customers through the company’s direct distribution chain.

- STET Hellas offers a wide range of tariff plans for both contract and prepaid customers. The company is **customer oriented** and its vision is to become customers' number one choice through innovative technology and flexible tariff packages. The contract customers are provided with basic network access and certain additional value added services under a range of tariff plans that permit customers to choose a combination of monthly service fees and airtime tariff rates that best suit their anticipated use of the Company's services. Each tariff plan consists of a monthly service fee. Airtime tariff rates and additional monthly charges for the use of certain value added services and is offered on the basis of a 12 or 24 month contract. But, the Company is preferable to its customers for its prepaid services. As a matter of fact, STET Hellas had by the end of the first semester of 2005, 1,454,584 million prepaid customers in contrast with its 802,728 million contract customers (<http://www.tim.gr>). In that sector, the Company offers pre-paid GSM service packages under the brandname B-free in low tariff plans, either for business customers either for daily customers. New customers may purchase a package that includes a handset, a SIM card and pre-paid airtime, allowing them to make and receive calls immediately upon purchase. B-free customers pre-pay airtime tariff for their outgoing calls and can receive incoming calls for one year. No monthly service fees apply to B-free services and B-free customers do not receive monthly bills.
- STET Hellas sponsors and supports a wide variety of non-profit cultural, business, educational, sports related and charitable community endeavors throughout Greece. The Company firmly believes that corporate contribution in the communities where its customers and employees live and work improves the quality of life and creates an even more favorable business climate for all Greeks. But what is the most important, is that the Company has organized successful promotional campaigns and has built a good brandname through innovative and "trendy" advertisements.

WEAKNESSES

- In the beginning of 2004, STET Hellas announced the change of the brand name TELESTET to TIM, introducing to the Greek market a well-established and internationally-recognized brandname. This strategic joint with Telecom Italia Mobile had as an aim to strengthen STET Hellas' image by leveraging on TIM's

awareness as well as on the advanced technical know-how and innovation associated with TIM group. But, the results of this initiative are not encouraging for the current time. First of all, TIM paid a lot of money for this re-branding and on top of all that, TIM has to pay again in 5 years, when its brandnames expires and has to be changed again. Moreover, the financial performance of TIM is worse in 2005 than in 2004. Although the company may have financial benefits in the long-term, nowadays it is facing bad financial performance and seems to have the **lowest market share (23%)** in the Greek mobile market, with only 2,257,312 customers. TIM's annual profits in 2005 have decreased in contrast with the previous year and this was due to the decrease in contracts (<http://www.tim.gr>). The Company has its strategy to keep only the "active" customers and to not care for the "inactive" ones, those who do not have used the net for the last three months. This strategy has as a result the decrease in the number of the company's customers. In the same time with the re-branding, the CFO changed. Dimitris Kouvatsois replaced Ruggero Caterini in June 2005 and he is now the new Chief Financial Officer. This was an important change in the company's structure and determines the future of many decisions taken by TIM. All the above prove that the re-branding was a risky initiative, taken in a time when the competition in the Greek mobile market is intense and which is the reason for the low profits.

OPPORTUNITIES

- The greatest opportunity for TIM seems to be the constant expansion of the Greek mobile market. The Greek mobile market continues to grow, bringing total mobile customers to more than 10 million, which indicates a nominal penetration level of around 95%. Nonetheless, room for growth still remains considering the combination of the relatively high inactivity level in the Greek mobile market and the tendency towards multiple SIM card ownership, as well as the traffic upside potential, stemming from the already evident **trend of fixed-to-mobile substitution**. Although TIM has now the lowest market share, there are bright perspectives to improve its performance. It can strengthen its strategy towards customers acquisition.. There are the ideal conditions but it is up to TIM's strategy whether it can exploit them.
- After the re-branding, TIM operates under a **Greek management team**. Dimitris Kouvatsois, as mentioned before, is the new C.F.O. and is considered to be the

linkage between the Italian Company and the Greek one. He can combine his knowledge and his experience of the Greek market and the conditions under which the Greek consumers behave, with the strategy the Italian Company follows. Focus should be given on the Greek market after taking, of course, under serious consideration the Italian general rules.

- On the other side, TIM can strengthen its position in the Greek mobile market by making good **buying out** or mergers. As a matter of fact, it has been announced recently (October 2005) that Q-TELECOM was sold to TIM partnership (<http://www.naftemporiki.gr>). This provides a great opportunity to TIM to take advantage of the differentiating strategy that Q-TELECOM seems to follow as far as tariff plans are concerned, and is a foundation for the increase of the new company's customers' base. By adopting a new integrated strategy the new Company can re-build a new strong brandname in the Greek market, provide innovative ideas about products and services and finally, improve its general performance.

THREATS

- The major threat for TIM proved to be competition. COSMOTE and VODAFONE have managed to have greater market share in the Greek market, although TIM was the first mobile telecoms industry that was founded in Greece. The competitors have developed successful strategies and each one of them has accomplished to acquire its segment among the Greek market. As a result, they are now at the highest level of growth and continue to shift their customer acquisition strategies. TIM's strategy to try to keep only the "active" customers has proved to be unsuccessful, since the other industries invigorate the acquisition of every potential user of mobile phones, either he/she prefers a contract or pre-paid services. TIM seems to follow or to imitate the strategies implemented by the others, instead of trying to promote its own services and products to those who prefer cheap and flexible mobile phones.

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Efficient distribution system • High ARPU in prepaid-cards • Customer orientation • Successful promotional activities • Leverages TIM group 	<ul style="list-style-type: none"> • Low financial performance • Minimal revenues from value-added services and data services 	<ul style="list-style-type: none"> • The trend of fixed-to-mobile substitution • Greek management team • The buying out of Q-TELECOM • Target price pickers 	<ul style="list-style-type: none"> • No potential of differentiation from the competition

Table 6 : TIM SWOT Analysis

2.5 S.W.O.T. analysis of *Q-Telecom*

Milestones (<http://www.q-telecom.gr>):

1981: Info-Quest established

1984: Establishment of an operational model for distribution

1993: Establishment of Q-PHONE (Mobile Telephony Service Provider).

1996: Acquisition of HELLAS ON LINE (Internet Provider).

Info-Quest is ISO 9001 certified

2000: Establishment of QUEST WIRELESS: Fixed Wireless Telephony License.

New distribution centre (8,000 m²) on Kifissou Ave., Rendi

2001: Mobile Telephony – 2nd generation license.

Info-Quest absorbs ERGODATA

2002: Launch of mobile and fixed telephony services by Info-Quest with the brand Q-TELECOM.

Info-Quest absorbs Quest Wireless

2003: Operation of Info-Quest own telecommunication network, mobile and fixed Q-TELECOM

2005: TIM buys out Q-TELECOM

S.W.O.T. ANALYSIS:

STRENGTHS

- Q-TELECOM was a division of Info-Quest and is the first Greek private integrated operator, which aims to provide combined services of mobile/fixed telephony and Internet. Its main strength is its **differentiation** from all the other operators in the Greek mobile telecoms industry. It offers services and privileges on easy charges and a variety of options. Focusing its commercial activities in the large urban centers, Q-TELECOM develops a second-generation mobile telephony network, with the installation of base stations as well as broadband Fixed Wireless Access network, point-to-multipoint, operating at 3.5 GHz range (<http://www.q-telecom.gr>). Simultaneously, it develops a national network with

the use of leased lines and privately owned transmission systems. Also, Q-TELECOM is directly inter-connected with O.T.E. and the three others mobile operators and has a national roaming agreement with Vodafone. Thus, it offers, since its commercial launch, high quality voice transmission, high transfer rate of call switching and also offers pan-Hellenic coverage. More specifically, Q-TELECOM provides a wide range of integrated telecommunications solutions and services for businesses and home users. It offers combined services of mobile telephony with the prefix 699 (prepaid and postpaid), SMS and fixed telephony. Q-TELECOM differentiates itself by providing customized services, **per second billing** from the first second of the call, elimination of set-up fees, mobile number selection, preferential rates with Q-Family, the **lowest tariff for SMS** from the first SMS and added value services.

- Q-TELECOM has established more than **900 selling points** all over Greece, by exploiting alternative distribution channels such as ACS courier (<http://www.q-telecom.gr>). But the most important is all the stores are customer-oriented and all the services are supported by the Customer Care on a daily basis.

WEAKNESSES

- All the above mentioned characteristics of the differentiating strategy that Q-TELECOM follows, seems to be weaknesses of its overall internal structure. In this environment of intense competition, it is a weakness for Q-TELECOM not to provide all the range of products and services that all the other operators offer. Since recently, Q-TELECOM operated only with pre-paid contracts and only in 2005 launched the first mobile contract (Q1). On the other hand, it focus its activities only in urban centers, without giving the opportunity to all the Greeks to use its services. Moreover, it operates with leased lines and with a combination of its own network and Vodafone's network, too, in order to cover Greece. This might has negative effects on its operational cost. In other words, Q-TELECOM in order to provide cheap services, has sacrificed the advanced quality of its networks, the investment on new technological developments and 3G services, the variety of the offered products and services and finally, has excluded itself from the “mainstream” competition.

OPPORTUNITIES

- Q-TELECOM is a new member of Info-Quest, one of the leaders in the Greek IT market. Since its establishment, **Info-Quest**, successfully incorporates new technological trends, providing all the spectrum of advanced products, integrated solutions and sophisticated services, satisfying all the current needs of Information Technology and Telecommunications' sector. During its twenty-year presence in the field of technology, Info-Quest has displayed consistency, reliability, sincerity, organization and a pioneering attitude in thought and deed. These qualitative factors, which it has fostered throughout its successful course, have enabled it to rapidly and effectively develop its activities, actively participating in developments by mapping out the future. Therefore, Info-Quest and its successful brandname provide an opportunity to Q-TELECOM to take advantage of its technological and structural internal background. Q-TELECOM is the new activity in telecommunications services, which Info-Quest is introducing in the Greek mobile telecoms industry and must have all the successful features of the parent company.
- On the other hand, Q-TELECOM's revenues reached 105,6 million euros in 9mo 2004 from 60,3 euros in 9mo 2003, an increase of 75% (<http://www.q-telecom.gr>). Moreover, its customer base on 2004, reached 721,000 active mobile connections and 66,000 fixed telephony connections. And during the fourth quarter of 2004, Q-TELECOM added 98,000 new additions on the prepaid contracts. Those numbers indicate a rather increasing trend in its performance and are very tempting for every possible investor. As a matter of fact, TIM expressed recently its interest of buying out Q-TELECOM and finally, after the negotiations, the **company was sold to TIM** for 325 million euros in cash and 25 million euros from debenture loan (<http://www.naftemporiki.gr>). This is an opportunity for Q-TELECOM to be part of the "mainstream" Greek mobile telecoms industry, having access to all services and products provided by TIM. It can no longer be an alternative in mobile phone market but become a rather competitive player.

THREATS

- **The buying out** of Q-TELECOM by TIM partnership is a very **risky initiative**. Apart from an opportunity for Q-TELECOM, it can become a threat to its

performance. Of course, it is upon TIM how it will absorb Q-TELECOM and what features it will give to the new integrated company. But, in every case Q-TELECOM's exclusive differentiating strategy will be abandoned and a new strategy will be implemented, which could benefit TIM's objectives. The future will show whether finally this initiative was an opportunity or a threat. The competition in the Greek mobile telecoms industry is intense and requires from the new integrated player (TIM and Q-TELECOM) to follow an innovative strategy, which will increase its market share and make it one of the leaders.

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • A low cost operator. • A virtual operator • Efficient distribution channels 	<ul style="list-style-type: none"> • Very limited product mix. • Weak brand 	<ul style="list-style-type: none"> • Target price pickers. • Create economies of scale by using TIM's network instead of Vodafone's. 	<ul style="list-style-type: none"> • TIM is also on a track to become a low cost operator.

Table 7 : Q-TELECOM SWOT Analysis

Part 3 International trends in the Mobile Telecoms Industry

The evolution of Mobile Telecoms Industry has been determined not by technology alone, but by the subtle interplay of **technology** and **market evolution**. And that evolution has been shaped by changing public policies. As a result, the business has evolved through three basic phases of industry development: (domestic) monopoly, transition and (globalizing) competition. Due to differences in technology and market evolution, as well as public policies, wireless value systems worldwide have different locational contexts. Until recently, four advanced but different types of regional advantages were recognized: **U.S., Western Europe, Japan, Nordic** countries. With the 3G transition the Nordic model had won but it was also bound to eclipse. With the convergence of mobility and the Internet, the Industry is witnessing the transition from geographic to strategic advantages (Steinbock, 2003).

A decade or two ago, most country markets were ruled by the de facto national PTT (the dominant network operator), which was the telecoms industry before the arrival of the new public policies. Today, most country markets are dominated by competitive entities that have emerged with the new public policies. In the U.S., competition evolved more quickly than in the Triad nations (Western Europe, North America and the Pacific Rim countries of Asia) for two reasons. First, AT&T was organized as a private-sector corporation under public oversight, whereas national PTTs in Western Europe and Japan were typically public-sector entities. Secondly, in the U.S., regulatory powers were separated 40-50 years before similar measures were taken in many Triad countries, where national PTTs enjoyed natural monopoly and regulatory power well into the 1980s and 1990s (Steinbock, 2003).

More specifically, the **U.S.** telecommunication services industry, which had revenues of \$246,4 billion in 1998, has experienced enormous changes over the last 15 years, driven by two major forces: deregulation and technology. For most of this century, the vast majority of U.S. telecommunications services had been provided by a single company – American Telephone and Telegraph (**AT&T**), founded in 1877 by the inventor Alexander Graham Bell as the Bell Telephone Company – over its wireline telephone network (Graduate School of Business, Stanford University, 1999). But, this monopoly situation changes in 1996 with the U.S. Telecommunications Act.

In the same period (meaning the last 15 years), the advent of new wireless voice and data services – and the subsequent explosive growth of this segment – was another part of U.S.’s telecommunications story. Advances in technology, coupled with burgeoning demand for mobile communications services and market competition, have brought wireless services squarely into the telecommunications mainstream. In the ground-based sector, key developments during the 1984-1996 period included the commercial introduction of the cellular phone system, its rapid growth during that period and the introduction of “personal communications service” (PCS) technology. While these events pertain primarily to voice communications, both the market and technology for wireless data traffic also evolved during this period (Graduate School of Business, Stanford University, 1999).

But, in 1996, the U.S. Congress passed legislation that pledged to create more competition in the telecommunications sector. The **Telecommunications Act of 1996** represented a compromise between long distance and local phone companies. Each group wanted to enter the other’s business. By directly providing local phone service, long distance companies (known as inter-exchange carriers or IXCs) could avoid paying access charges to local phone companies (known as local-exchange carriers or LECs) for the origination and termination of long distance calls. In 1996, these access charges were significant for both groups, accounting for about 40% of the cost of a domestic long distance call and about 40% of LECs’ total profits (Eisenmann and Green, 2002). The new law created a “competitive checklist” – a set of 14 criteria that must be satisfied before ILECs are permitted to offer long-distance service in their regions. The law left the enforcement and specific regulation to the FCC. Among the key issues addressed by the checklist, the law requires the ILECs to provide (Graduate School of Business, Stanford University, 1999):

- Non-discriminatory and cost-based interconnection
- Unbundling
- Number portability (when technically feasible)
- Dialing parity
- Non-discriminatory access to local services
- Access to rights of way
- Reciprocal compensation

The Telecommunications Act of 1996 mandated sweeping deregulation of the telecommunications industry, including the opening of local service to competition.

But, by 2002 many parties felt the Act had fallen short of its potential. According to Reed Hundt, in October 2001 “The Act had two unwritten goals: prices for telecommunications services were supposed to go down and everybody’s stocks were supposed to go up. And for four years that’s what happened. But, it had been proven that there is only one way that service prices can go down while everybody’s stocks go up: customers have to pay more for more services. That means a customer pays less for each individual service, but buys a larger number of services and thus pays more in total. So for a while, it looked like something resembling regulated competition was working beautifully. But when the capital market burst and so many companies failed, some people blamed the regulated competition model. Now, we might debate whether the model was truly flawed or whether it was just never fully and properly implemented, due to court intervention and a failure of political will, or whether the market’s exuberance killed it. But, for many that model has been discredited while for others, it’s clear as a bell –pun intended – that the alternative to regulated competition, the “regulated monopoly” model, doesn’t meet our goals either. So, we are skeptical of both models now, but no one really knows what model is best, because the answer changes as the industry evolves” (Eisenmann and Green, 2002).

While the above are taking place in U.S., in **Europe** as soon as the telecommunications markets in most of the member states have been fully liberalized since 2002, intense competition developed in the field of communications, which led to the construction of alternative networks and decrease in prices (Gabelmann, 2001). The Thatcher government privatized British Telecommunications as early as 1981. Nordic countries initiated deregulation in the early 1980s, but had favored a more competitive supply relationship: they had begun wireless cooperation already in the late 1960s. In Finland, for instance, the vendors had competed for decades, the legal aspects of deregulation were codified in 1987. However, the phased privatization of Sonera, former national PTT, proceeded far more slowly; the government still held a majority stake in 2002 (Steinbock, 2003). In 1985, NTT was privatized in **Japan**. Despite privatization and deregulation, NTT DoCoMo continued to control more than 50% of the wireless market in Japan at the beginning of 2002. In the same time, the cellular concept was changing and its execution has resulted in three successive technology generations: 1G / analog cellular (AMPS supremacy), 2G / digital cellular (GSM triumph), 3G /

multimedia cellular (W-CDMA, single flexible standard) and 4G / broadband cellular (figure 5).

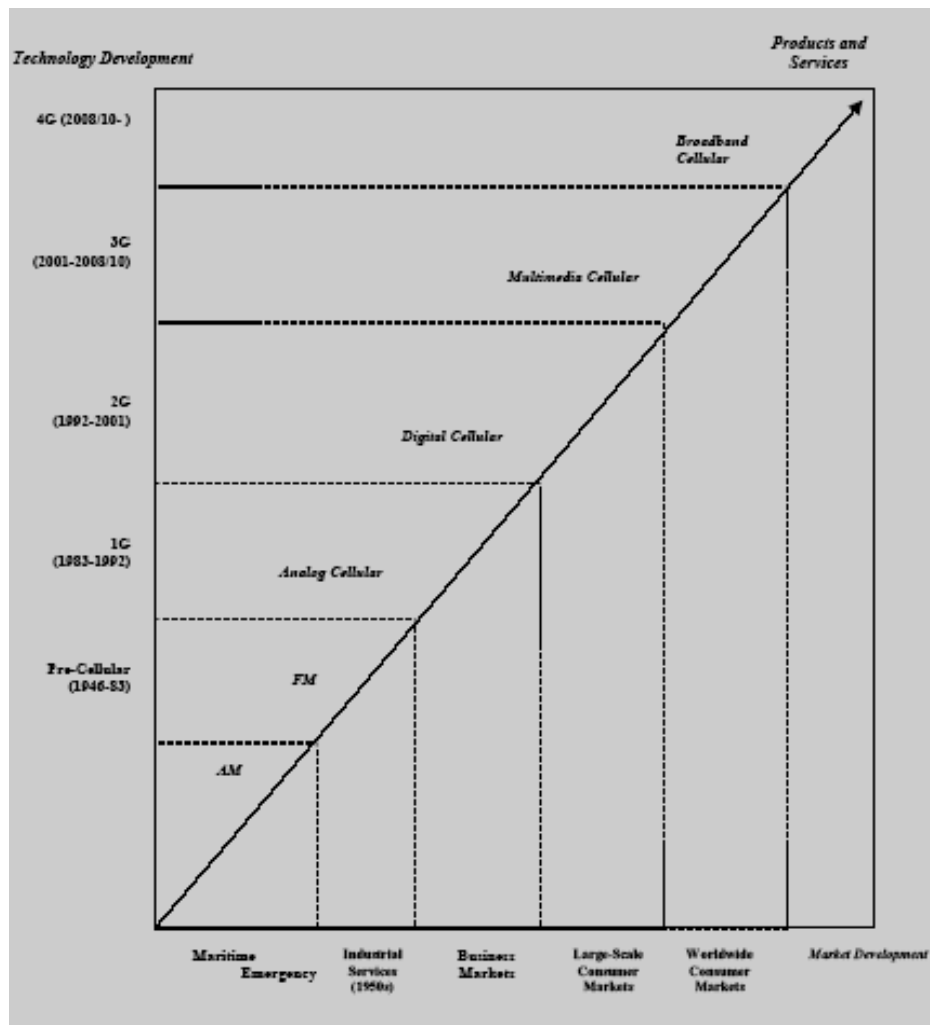


Figure-6: From Marconi to 4G: technologies, markets and innovation (Steinbock, 2003).

So, it becomes true that in recent years, global mobile telephony has experienced spectacular demand growth that is unmatched by anything in the long history of fixed network-based telecommunications. The International Telecommunications Union (ITU) estimates that in 2002, the number of mobile cellular subscribers (over 1,15 billion worldwide) surpassed the number of fixed main lines in service (nearly 1,13 billion worldwide) for the first time. Competition has marked the development of global mobile telephony since its inception. Rarely have

countries permitted monopoly provision of mobile services, instead duopoly or more open competition has been commonplace (Banerjee and Ros, 2004).

As far as the regional distribution of the spread of mobile telephony relative to fixed telephony is concerned, Africa and Asia seem to gain in their worldwide share of mobile subscribers. Europe's share of mobile subscribers grew, while its share of fixed main lines actually fell. The Americas and Oceania lost ground for both fixed main lines and mobile subscribers, as it is revealed from ITU's data (APPENDIX B).

Conclusively, despite a slow start, the global spread of mobile telephony within the last decade has been nothing short of phenomenal. Not only has mobile subscriber ship caught up with fixed main lines worldwide during that time, but some countries appear to have deliberately pursued policies and strategies to develop mobile telephony as fast as possible. Generally, relatively less affluent countries appear to have favoured the leapfrogging of fixed telephony by mobile telephony, i.e., experienced technological substitution.

More striking, however, is the finding that even the relatively less affluent among the OECD and European Transition bloc countries—where teledensities are generally in the medium to high range—have pursued such leapfrogging (Banerjee and Ros, 2004).

In contrast, most countries of South and Central America (with the exception of Brazil, Honduras, and Panama) and the more populous but relatively less affluent countries of Asia appear to have followed the more conventional course of building out their fixed networks and raising teledensities, although China (and, to a lesser extent, India) has made important strides in quickly raising its cellular density as well (Banerjee and Ros, 2004).

Finally, the more developed and affluent countries around the world—which also tend to have the most open and competitive telecommunications markets—have already achieved high levels of teledensity and cellular density, and all ongoing growth in these densities is relatively modest. There is no evidence of any bias in these countries in favour of one form of telephony over the other; in fact, it is not uncommon for citizens of these countries to use both forms of telephony to suit their lifestyle needs. Whether or not fixed and mobile services in these countries are economic substitutes can only be determined from a study of cross-price effects. Unlike other parts of the world, however, there is no evidence that mobile services are technological substitutes for fixed services in these countries (Banerjee and Ros, 2004).

Part 4 Projected trajectories

4.1 The new “datacom space”

As new players are drawn into the telecommunications industry it is appropriate to mention what has been referred to by Seaberg et al. in 1997 as the “**datacom space**”. Datacom is the hardware, software and services used to transport data and voice traffic over an IP-based network. There is a battle in this datacom space, “the battle of the networks”. In one corner are the incumbent equipment and service providers that have together spent more than \$300 billion building extensive proprietary phone networks. In the other corner are a crowd of upstarts hoping that the new technologies and superior economics of Internet protocol (IP) networks will allow them to attack the incumbents’ position. In other words, there is a boom in voice and data traffic and a transition from a circuit – to a packet – switched telecommunications infrastructure.

The competition is intense. Now, the competition is spilling over from datacom into the much bigger and more lucrative telephony space as they attempt to hijack the voice traffic. How far they succeed will largely depend on what incumbents do to protect their sizable investments in these networks. Lessons drawn from other industries demonstrate that incumbents and attackers can both be winners in the battle for value, though. Telecom players can imitate other industries –especially computing – and can gain insight into the business models that are likely to emerge and the ground rules for those who want to win.

The Greek mobile telecoms industry belongs in the above “datacom space”. But, in order to compete with the “huge” players, needs to develop multiple strategies

and to re-evaluate the existing ones. Industry evolution arises from major changes such as globalization of markets, development of trading blocs or technological change that shape long-term industry dynamics (Dodourova, 2003). Technological change in an industry often means changes in how the industry and its boundaries are defined. This, in turn, changes the relevance of the competitive strategies pursued by each firm in the industry and brings a need to re-think them in the light of the changed industry conditions. New strategies have to be formulated to fit these new environmental conditions (Dodourova, 2003).

And strategies are not chosen; they are programmed (Whittington, 2001).

Strategic management is concerned with:

- Putting an organization into a competitive position.
- Sustaining and improving that position by the deployment and acquisition of appropriate resources and by monitoring and responding to environmental changes.
- Monitoring and responding to the demands of key stakeholders.

Moreover, the following dimensions should play a significant role in strategy formation (Williamson, 2001) :

- A rational dimension
- An environmentally determined dimension
- A political and cultural dimension

In every case, for every manager the strategy-making process starts with a **fundamental strategic choice**: which theoretical picture of human activity and environment fits most closely with his or her own view of the world, his or her personal “theory of action”. Strategic visions should project long into the future, inspiring the troops while never wavering from the bottom-line. Top managers should

decide their strategies with all the cool objectivity of formulae and matrices, undistracted by the details of operations. Structures should always follow strategies (Whittington, 2001).

Therefore,

First of all, the Greek mobile telecoms industry, before trying to formulate its own competitive strategy for the future, should take into serious consideration the above mentioned, environmentally determined dimension. In other words, it should take into account the forecasts both for the international and the European mobile telecoms industry, so as to keep up with the changes and with the European competition.

4.2 Forecasting the international mobile telecoms industry

In 2004, the total value of the global telecom services market was estimated at 1,117 billion USD, representing a 5.3% increase over the previous year. Compared with 2003, growth in 2004 slowed down and returned to its level in 2002. The relatively improved performance of 6.9% in 2003, was attributed to a slight revival in the US market after a net decline in 2002, to a boom in the Chinese market and the recovery in Latin American markets after the recession years of 2001 and 2002. Growth in 2005 can be expected to rise slightly to 5.5%, resulting in an overall market worth 1,179 billion USD (APPENDIX F).

Mobile services have generated most of the growth in the telecom services market. In terms of value, they exceeded fixed telephony in 2003, while their share of the telecom services market as a whole keeps increasing (39% in 2001 and 49% in 2002). In 2004, their contribution to growth in terms of revenue amounted to 52

billion USD and should reach 59 billion USD in 2005. An enlargement of subscriber bases is chiefly behind the growth in telecom services. By the end of 2004, the number of mobile subscribers had risen 21.5% to 1.7 billion by the end of the year. The pace of growth has remained steady at around 21% since 2002. Some estimates indicate that it will slow down very slightly in 2005 to a little under 20%. By the end of 2005, there should be an estimated 2 billion mobile subscribers around the world (APPENIX G).

Data and Internet services are playing an important role in regard to worldwide growth. In 2004, revenues from these services were 13 billion USD higher than in the previous year and now account for 15% of the total telecom services market. While the market for corporate data transmission services exhibits steady growth (3 to 4% in Western Europe, slightly less in North America), the most remarkable growth is to be found in the Internet sector. In 2004, the number of broadband connections grew by 54 million to a total of 156 million, and the 200-million mark should be reached by the end of 2005. The total number of Internet subscribers passed the 400-million mark in 2004.

Fixed telephony continued on the downward trend that started in 2002. Its share of the global telecom services market in terms of revenue fell from 45% in 2002 to 39% in 2004 and is likely to fall further in 2005 to 36%.

More specifically, the Western Europe mobile market is nearing saturation in most countries, with a very high average penetration rate of 92% at the end of 2004. The fact that some users have more than one subscription has nonetheless inflated the numbers. Close to 60% of Western Europe's mobile subscribers use prepaid cards.

By mid-year, Europe's role in the 3G market was confirmed, with close to 13 million UMTS subscribers at the end of June 2005, up from 5 million at the end of

2004. To compare, Japanese incumbent NTT DoCoMo was serving a base of 8.5 million FOMA subscribers at the end of 2004 rising to 16.7 million in mid-2005.

Overall in the world telecom services market, the ARPU in 2004 continued to fall (8%) but to a lesser extent than in 2002. The fall is felt particularly strongly in the area of voice services because of the lowering of prices and voice/data transmission.

Minutes of use (MoU) for voice calls varies widely from country to country, largely because of the tariffs being charged: in 2004 average MoU per subscriber was around 76 minutes in Germany, compared to 258 minutes in Finland.

3G pricing plans reflect the capacity available on the networks, and allowing mobile operators to bring their voice tariffs in line with those charged on fixed networks, and so step up the trend of replacing fixed calling with mobile (APPENDIX E).

4.3 Forecasting the European mobile telecoms industry

It is worth still to examine what is happening now in the European mobile telecoms market. During 2005, the Western European mobile telecoms market reported a **growth of 15 percent**, compared to 17 percent growth in 2003 and 2004. An important reason for the positive development in Europe for the last years is the rapid development of product features and product designs. About 30% of the mobile phones sold in June have Bluetooth functionality, MP3 is already included in more than 20% of the GSM products currently sold and 95% of the 3G phones sold have MP3 or similar technology on board. The impact of 3G products is only slowly increasing. The country with highest share for 3G products is Italy with about 30% of the sales recently. This is of course linked to the subsidy given on 3G sales in a market, which traditionally developed without subsidy. Growth sales of more than 20

percent for Czech Republic and more than 30 percent for Poland and Russia for the first half year indicate an even faster growth in East Europe. The 2005 mobile phone sales in Russia will be for the first time higher than the sales volumes in the UK or Germany (<http://www.inatelecom.org>).

But before trying to forecast the future of the mobile telecoms industry, we should take into serious account some critical issues as far as the **European players** are concerned (Forge, S. et al., 2004):

- ✓ Generally, the European suppliers have an agenda which tends to favour a prescriptive 3G mobile solution, perhaps for as long as possible.
- ✓ The operators in Europe are most inclined to conserve revenue streams from current investments. They are not inclined towards new technology that will perturb this, nor open the market to new competitive players of the backs of this technology.
- ✓ There are few voices in the ITU decision making community who see that the dominant factor in examining demands for services and spectrum should be based on economic and social factors. Most of the discussion is from a techno centric viewpoint, or that of regulator at a national level pursuing interests of national suppliers and operators.
- ✓ There is no champion in this arena explicitly taking the part of the end-customer.
- ✓ There is some risk that the industry, in trying stave off new technology, will not realize its mistake until it is too late, when such technology at far lower cost arrives from another region.

But, still, **Internet technology** developments constitute a major challenge for the telecommunications sector, with telephone through the Web (Voice over Internet

Protocol, or VoIP) threatening the revenues of traditional landline telecom giants, particularly in international calls, according to the annual sector report by the Organization for Economic Cooperation and Development (OECD). The survey suggests that although the sector has now returned to profits after the shock of excessive investments at the end of the previous decade, the future will have even greater competition in store. Telecom service pricing in OECD countries keeps changing with a declining trend for rates, favoring customers. One after another, telecom companies are led to charging a standard rate without counting local calls, while the geographical zones where calls are considered local are constantly expanding. In addition, however, VoIP presents a challenge to mobile telephones, too, which in many countries are now more numerous than fixed connections.

In 2003, for the first time ever, **the number of fixed phones lines actually fell in OECD countries**, with mobile operators gaining market share at the expense of the traditional telecoms companies, a trend which continued in 2004 and 2005. As for Internet telephony, a comparison of the cost of calls via Skype, a VoIP provider, and via traditional fixed-line carriers in OECD countries revealed an average saving of 80% using Skype, according to the OECD report. On a per capital basis, Denmark, Poland and the Netherlands are the largest users of Skype.

Looking ahead, the OECD predicts that new service offerings from traditional carriers, such as **Wi-Fi** hotspots in cities (Wi-Fi refers to the 802.11b wireless Ethernet standard that was designed to support wireless LANs), will provide tougher competition for 3G mobile operators than these had been expecting when they obtained their licenses, in many cases for large sums (Lehr and McKnight, 2003). To maximize revenue, 3G operators may need to change their charging policies, for example by persuading customers to sign up for longer term contracts rather than

purchasing calling time on an ad hoc basis, as is presently the case for a large percentage of customers relying on pre-paid cards.

Among other things, the report forecasts that:

- Service operators will increasingly offer integrated video, voice and data products in a single service package.
- The growing popularity of downloading video from the Internet will reduce the time people spend watching free-to-air TV, driving down audience share and advertising revenue for broadcasters and making it harder for public-service broadcasters to meet their social policy objectives.

Increasing competition from new platforms, notably broadband Internet, with traditional broadcast or telecoms providers may require a re-examination of existing regulatory frameworks. Particularly, regulators may need to review obligations regarding universal telecommunications service as more companies offer telephone services over the Internet without having a physical presence in a country (OECD).

On the other hand, the Greek mobile telecoms industry, should design its new future strategy, based on social and cultural dimensions of the Greek society.

4.4 Forecasting the Greeks' behavior towards mobile phones

The forecasting of their future strategies must be based on some **social factors and trends** of the modern Greek society, which affect the consumers' behaviour towards mobile phones and determine the demand curve.

First of all, it is admitted that we are living in an increasingly individualistic society where modern Greek people no longer follow “established” and traditional

patterns of behavior but rather choose their own personal ways of being, goals and aspirations. We evolve a mosaic of careers, relationships and lifestyles that intermingle and give us simultaneously a sense of freedom and endless opportunities and of stress and anxiety. In this environment, people are looking for **customized solutions, simplification** and control (<http://www.receiver.vodafone.com>). Technology can deliver such solutions, but it can also add to our stress. The deciding factors are how we access and engage with technology and the level of control we maintain. One solution lies not in a proliferation of gadgets, but in embedding the enabling technology into our everyday objects and environment. Mobile phones have become an “intelligent” commodity that facilitates our life, or even anticipates our needs. The bet is on whether they could only make our life easier without making it more complex and more expensive.

On the other hand, Greeks always give great importance to the need for other people for shared experiences and for community. There is a growing need both to feel part of something and also to explore and learn. **Linking and connecting** with like-minded people, on the one hand, and interacting with different people, on the other, are seen as means of both identity and exploration. In a complex and fragile world the “cult of the individual” appears less a recipe for success and survival and belonging, sharing and bonding become important, but against the background of a more fluid and mobile world. Furthermore, in the knowledge age, people are seen as the source of such knowledge and so people are searching for ways to tap into other’s knowledge. Technology and therefore mobile phones are used to enable the group or community in this process of meeting and sharing.

Moreover, in Greece we talk now about a post-consumption or no needs society, in which people look for something beyond the satisfaction of their functional

needs. With primary needs satisfied, people look increasingly to satisfy other, more sensorial, emotional and even spiritual desires. The goal is to **experience** and explore rather than to consume. Complementary to this search for sensorial gratification and experience is a growing awareness and emphasis on the non-rational, on emotions, feelings and intuition as a way to navigate the complexities of today (<http://www.receiver.vodafone.com>). Rationality and logic alone are no longer sufficient to guide us on the right path. In this script we can think of how technology can enrich our daily living and how it can foster our need for play, discovery and creativity.

Finally, there is a growing concern about the “state of the future” that we are building for generations to come as well as about the necessity to find a balance between consumer’s wants and society and the planet’s needs. People are beginning to question the very notion of “more is better” and to re-define the quality of life. This social trend focuses beyond materialism towards values and meaning: an awareness of holism, **wellness**, spirituality and authenticity. The question here is: how can technology help us to create a more sustainable future? In this spirit, technology can become part of the solution instead of being part of the problem.

All the above mentioned social factors determine users’ behavior towards mobile phones. Every mobile phone company has as its main objective the satisfaction of the consumers and implements this strategy, which contributes to the achievement of this goal. So, in order for them to gain a competitive advantage in the future, they must always examine and search the social trends that are constantly taking place in Greece. Those trends, changing values, desires and expectations lead to a number of scripts for the future.

4.5 Forecasting the evolution of the Greek mobile telecoms industry

The truth is that the Greek mobile telecoms industry is characterized as an oligopoly and satiated. According to recent researches conducted by mobile telecoms companies, the Greek market is considered to be “closed” and not entirely liberated, since it is hard for interests to be reallocated. But, despite the above, great interest can be generated from the perspective of a correlation between mobile and fixed telephony and a possible merger between COSMOTE and OTE. The biggest threat, though, for the telecommunications, is the mobile phone industry, which has gained the greatest market share in urban and domestic calls in Greece. In this market, the economic environment is volatile, especially since a great buy-out of Q-Telecom by Info-Quest, Apax Partners and Texas PG, took place in Greece during 2005.

Data and Internet services –though - are still at their early stage in the Greek telecommunications market. The penetration of broadband Internet in Greece is only 1% and people are not willing to show more interest for “new technologies”, according to researches conducted by E.D.E.T. Even a 5% percentage of broadband Internet penetration, is considered to be a very satisfying rate of Internet services’ growth. This affects, of course, the mobile telecoms market. Greek users are still indifferent to the innovative and attractive 3G services, the mobile phone companies offer. What is important, is the fact that Vodafone, Cosmote and TIM have invested great amounts of euros on 3G mobile phones and 3G services. And when asked, the above companies, they claim that they hope that their investment will have profits in the long term.

Despite the dissatisfying rate of growth, the Greek mobile telecoms market is still considered to be attractive for both Greek and foreign investors. Even though we are at a mature stage, there are great expectations of surplus-value. Those expectations

were recently reinforced by the buying out of Q-Telecom by TIM partnership for 325 million euros in cash and 25 million euros from debenture loan. The amount of the given money was enormous for such an investment and urged the investors' interest. Q-Telecom is an alternative mobile phone company, which has as its main strategic characteristic the low tariffs. This is a threat, of course, for the other players that have to formulate new plans, in order to preserve their market share.

Nevertheless, many other scenarios are generated, which give surplus-value to a possible creation of a European or even international telecommunications net. In this environment, it will be convenient for many mergers, acquisitions and entries of foreign players to take place, with major influences to competition. The Greek companies with the lowest market share can take advantage of these changes and become part of this scenario, since they can accept possible proposals for mergers with greater companies.

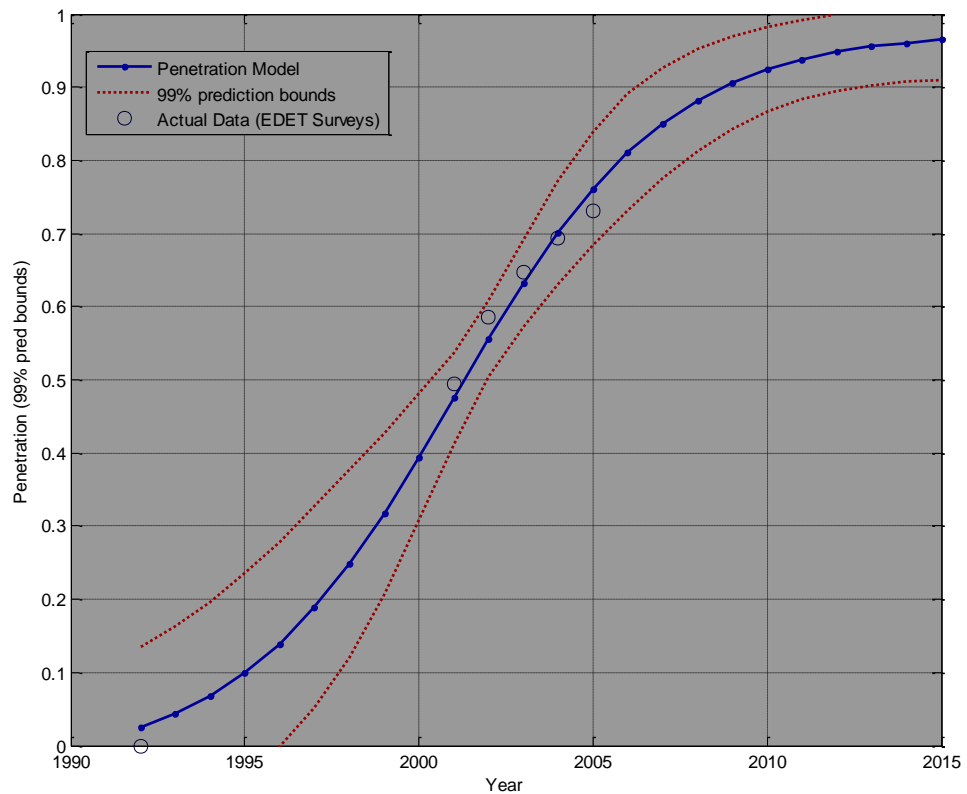
In this context of fierce competition, telecom operators are looking for other avenues of growth in order to offset revenue losses in their core businesses. An operator's strategy depends on several factors, notably on its positioning in the market and its marketing objectives. However, regardless of the type of player, the alternatives of a chosen strategy, are either to attack the market with an innovative offering or to response to commercial launches by the competition.

The major objective is the consumers' satisfaction. But, customers' needs are stated more in terms of features and uses than of technology, and solutions generally need to be customized as requirements will vary from industry to industry. Nevertheless, the crucial factors, on which the consumers' choice will depend are the low tariffs and the quality of the services .

Practically, the crucial factors on which the future of the Greek Mobile telecoms industry will depend are the low tariffs in addition to high quality of the offered services. The changes are constant on a daily basis. The four players advertise daily innovative and economic packages, in order to attract customers and to gain profits. Moreover, many strategic enterprising movements are taking place daily. The most recent and significant one was the buy-out of GERMANOS by COSMOTE. With that buying out COSMOTE managed not only to improve its distribution network but to reinforce competition by having GERMANOS as monopoly.

On the consumers' side, researches have proven that the young users of mobile phones are determining the strategic movements of the players. The truth is that even ten years' old children have mobile phones and do not separate them even at school. The 67% of those users have mobile phones with prepaid contracts whereas when they get older they prefer contracts. But at those young ages they are keen on gadgets, they prefer trendy handsets and they choose a mobile handset according to its digital camera, games and MP3 player. Their best "habit" is sending SMS's to their friends. So, the bet for the Greek players lies on which will offer low tariffs on SMS's, high-tech mobile handsets and gradually on which will risk to try to establish to this market the MMS's, the video-calling and even mobile T.V.

A model of the penetration of the use of mobile telephones in Greece based on actual data from EDET (Greek Educational and Research Network) surveys, shows that:



The model that was fitted to the data was:

$y = c + S(x, a, b)$ where:

$$S(x, a, b) = \frac{1}{1 + \exp(-a \cdot (x - b))}$$

The coefficients were calculated, with 95% confidence as follows:

$a = 0.3255$ (0.2425, 0.4086)

$b = 2001$

$c = -0.02487$ (-0.06289, 0.01315)

Regarding the goodness of fit, we got the following scores:

SSE = 0.003105

R-square = 0.9915

Adjusted R-square = 0.9894

RMSE = 0.02786

The above model describes the penetration of the use of mobile phones in Greece and proves that there was a “boom” in the consumers interest for mobile services during the decade between 1990-2000 and since then the demand curve shows to be stabilized with a rather increasing perspective. Penetration rates of mobile phones, in Greece, seem to be at their pick point and therefore the perspectives for a further increase are rather pessimistic. Of course, the limits are the 100% of the Greek population, but still the great majority of Greeks set the rules of the strategy of the four players in the mobile telecoms industry.

In this environment, a possible pessimistic scenario for the Greek market would forecast economic stagnation. In this stagnation, telecommunications in Greece is dominated by the incumbents and by the government protecting its fixed line incumbents against the three forces of cheap VoIP, new small mobile operators and new technology undermining the 3G mobile investments of the incumbents in mobile or fixed line services by wireless broadband.

The number of the mobile phones’ users is fixed and the market is “calm”, including the four traditional players (Cosmote, Vodafone, TIM and Q-Telecom), since no new entrants are taking place. There is a conflict between traditional pricing of services on behalf of the incumbents and the real desires of consumers, which can not be satisfied on lower pricing due to the lack of competition, as there are effectively no new entrants. In other words, consumer prices in mobile services remain high. Moreover, the operators are slow to realize or even ignorant of 4G mobile telephony and capabilities or very cautious if they do understand the potential. Both the government and the operators consort to **preserve 3G mobile license dominance** and resist 4G takeoff as it is seen as a commercial challenge to current cash flows for both. Suppliers also wish to recoup 3G mobile investments, and so do

not invest heavily in 4G, lobbying for 3G prolongation in Greece. Under these conditions, the market stays with 2,5G and 3G.

All the above have two impacts on the Greek market. The first one is on innovation. Having stabilized the number of their customers and in an absence of competition, there is no incentive to improve and the companies do not have to introduce new technology at all. The second effect is on prices, which are high. As a result, competition is driven now to the point where competitive advantage is gained by the one who will achieve cost leadership. And the company, which plans to become cost-leader, has to decrease overall costs. More specifically, its strategy should include control of the cost drivers: it must capture scale economies, organize better its vertical integration and generally make prudent strategic choices related to operations.

In this environment, the four Greek players will have to formulate new strategies, focusing at making the right and effective fit between their strengths and weaknesses, on the one side, and opportunities and threats, on the other side.

- COSMOTE is the market leader and its aim is to maintain its market share or even increase it, taking advantage of its investment on i-mode. What is very important is the fact that recently has reinforced its weak distribution network by buying out GERMANOS, a very powerful and popular Greek chain of stores. Moreover, the focus in the future will be given on the expansion in SE European markets, because they are a fertile ground for investments on mobile services. But, its basic opportunity is to take advantage of its supporter and main shareholder, OTE, the incumbent fixed telecoms provider in Greece. A possible merger between OTE

and COSMOTE will have dramatic changes in the Greek mobile telecoms industry, making it possible a correlation between mobile and fixed telephony. This will be a significant strategic movement, which will affect the strategic plans of the other players, the new services and the tariffs of both fixed and mobile telephony in Greece.

- Vodafone's ARPU is very high, and that is very important for its financial performance and its share in the Greek market. In fact, it is the only Greek player, which has the greatest share in contracts. The bet for Vodafone will lie on whether it will be possible to control the tariffs. Its strategy has to focus on cost leadership in contracts. On the other side, its main strength, which can become an opportunity is its access and its support by the Vodafone Group. The company can take advantage of the slow but still stimulating rates of the Internet and new technologies' penetration in the Greek population, and can promote new advanced services in the Greek market. The Vodafone Group's global R&D can support such a strategic movement and add a new "high-tech" dimension in the mobile services in Greece, as long as cost is controlled.
- Finally, both TIM and Q-Telecom constitute a new player with great perspectives of making innovative for the Greek market strategic movements. Q-Telecom can create economies of scale by using TIM's network instead of Vodafone's and TIM is also on a track to become a low cost operator. Their major target is to become the cost leaders, to reinforce competition on tariffs and therefore to attract the young users, mainly, who give great importance to tariffs. They have recently started a very popular advertising campaign, which have great impact on young people and which focus on low prices, both in contracts and prepaid cards. Therefore, their strategy should be orientated towards cost leadership.

Conclusively,

All the researches, conducted by E.D.E.T., prove that the mobile phone industry in Greece had a rather “spontaneous” life cycle and now seems to be at its **mature stage**. Nevertheless, in such a volatile environment, with the technological developments to be the most important factor that drives the future of the mobile phone industry, no one can assume that the transition to maturity is the first step for the decline. On the other hand, the most possible scenario seems to be the one that forecasts stagnation in the Greek market but with trends of smooth development. Maturity may force the Greek companies to cope better with their competitors and to make the right strategic choices, implementing either rationalized strategies or risky ones, based on innovation and differentiation. And this because it will become a matter of survival for them. Plus they have a very strong advantage; they are promoting a very successful product, mobile phones, which not only they have become a commodity for the Greek society but they are a kind of gadget, too, with the new 3G services. The future is bright as soon as they take advantage of the new opportunities after taking into consideration their internal weaknesses. Any strategic choice should include the less risk and make the best fit with their own structure. Competition and therefore imitation are daily dangers, but they should become the kick-off for new initiatives. The profit is the main objective for the Greek mobile telecoms industry but customer satisfaction is the means for achieving high profits.

CONCLUSIONS & RECOMMENDATIONS

What is for sure in every case is the importance of the role of the mobile telecoms industry in the Greek market. Greece's mobile operators Cosmote, Vodafone, TIM and Q-TELECOM held today a joint part on all matters pertaining to the economy and society and on the framework, in which mobile telephony is operating in Greece today.

They belong both in a national and an international environment – legal, economic, social and technological - , from which they get influenced and which they affect themselves. Their strategies try to be – or should try to be - a **right fit** between their strengths and weaknesses, from one side, and the opportunities and threats of the external environment, on the other side.

However, after 12 years of presence in Greece, mobile telephony is still a technological innovation and a sector with **great uncertainty**, too. Every attempt of forecasting its future is rather risky. Even though, the mobile market has achieved to be in its mature stage, after the impressive “boom” of its start and the impressive increase in demand in the years after the launch of the operations of the four players, there are many scenarios, which predict its future.

The global and the Greek environment of the mobile telecoms industry is volatile and every attempt of adjusting strategies in the daily needs of the users, seems temporary. In every case, the matter are the tariffs and the quality of the offered services, which play the major role in the consumers' choice. COSMOTE is the leader in market share but Vodafone has the highest ARPU in contracts. On the other side, TIM and Q-Telecom managed a very successful partnership, which drives the competition on low prices. But, they is not much room for everyone, since the Greek market is limited and penetration of mobile phones is at its pick point. Maybe, the solution will be given by a possible correlation between mobile and fixed telephony, but this is a rather “difficult” scenario in Greece to happen. The consumers make the decisions and the companies follow their needs, but sometimes the companies can formulate strategies in order to predict the consumers' needs.

Still, what should always be taken into serious consideration is the **penetration of mobile phones** in our lives. Mobile telephony has become an absolutely necessary tool for communicating, for modern people. But, it is not the whole story. Mobile phones are now means for entertainment, for doing business and – the most important - for providing e-services, too. The new products and the new services are high – advanced and provide great opportunities for every kind of interest.

And the last one should be the object of a further research. What is missing and seems to be rather major for the future of the Greek mobile telecoms industry, is the importance of the new technology as far as it concerns mobile phones, for Greeks. Technology developments are constant and change the scene of the Greek market. But, consumers' respond to those rapid changes is not predictable. It is rather possible for Greeks not to react positively to the expansion of 3G products and services and further to any adoption of 4G mobile phone services.

For many the future of mobile phones in Greece is bright whereas for others it is disappointing. Everything lies on consumers' respond but still the truth is somewhere in the middle.

APPENDIXES

APPENDIX A

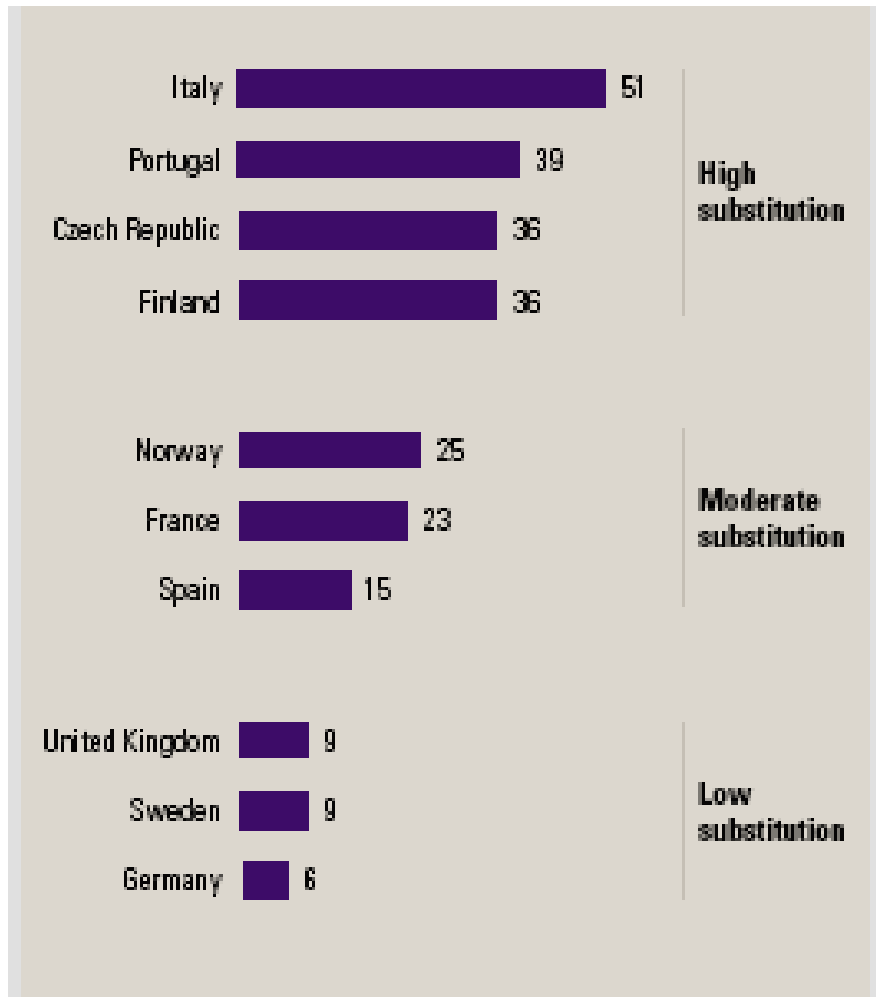


Figure-7: Loss of fixed access traffic to mobile as % of total potential fixed access traffic (Beardsley et al., 2002)

APPENDIX B

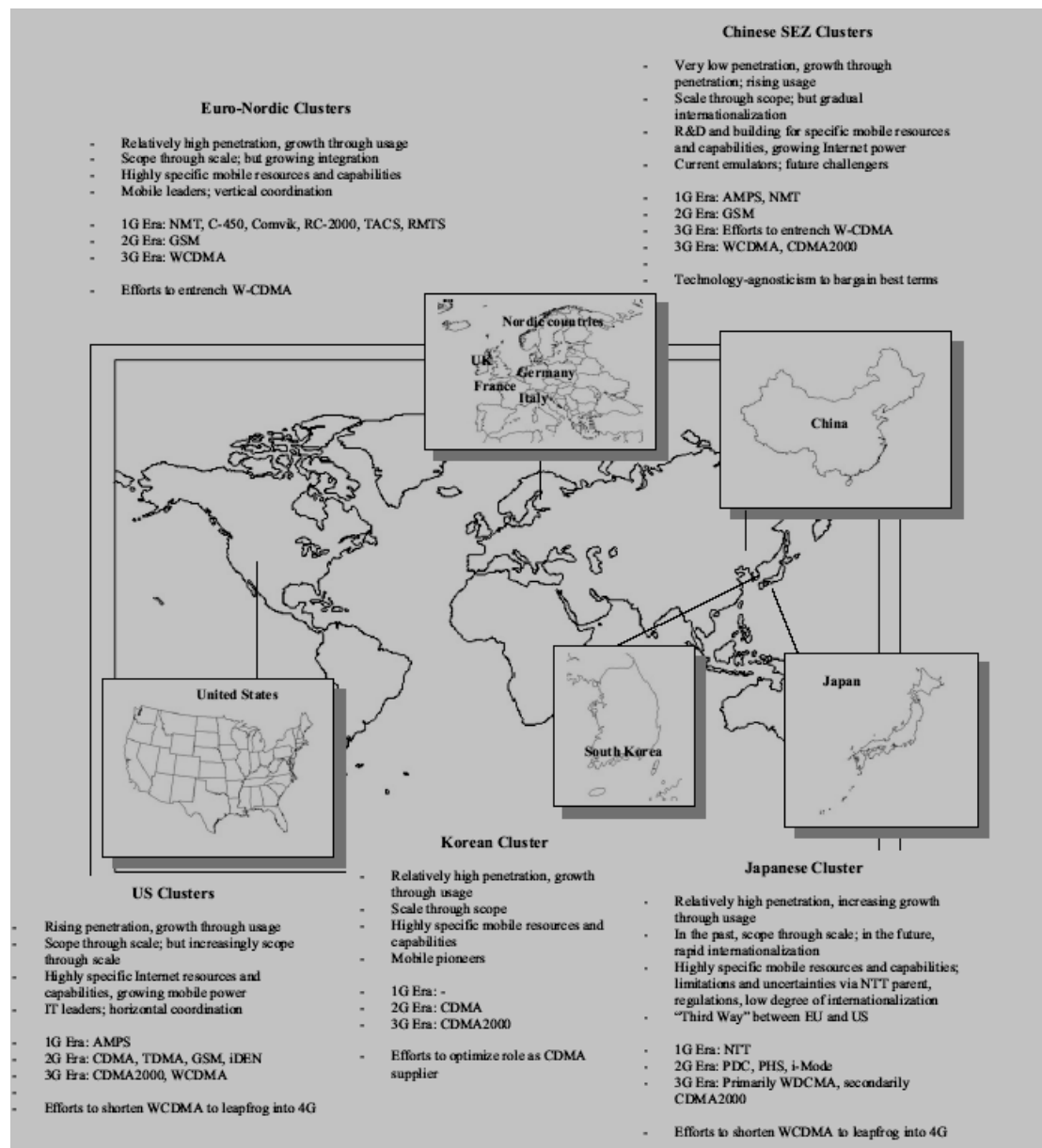


Figure -8: Core Clusters (Steinbock, 2003)

APPENDIX C

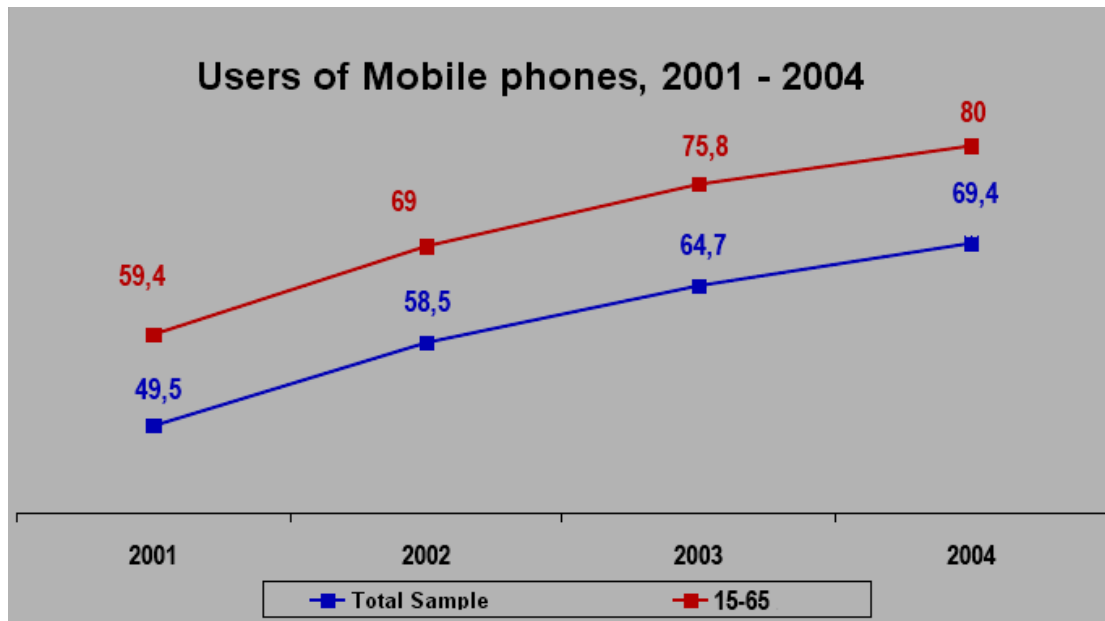


Figure -9: Users of Mobile Phones, 2001 -2004 (E.D.E.T. – <http://www.e-businessforum.gr>)

APPENDIX D

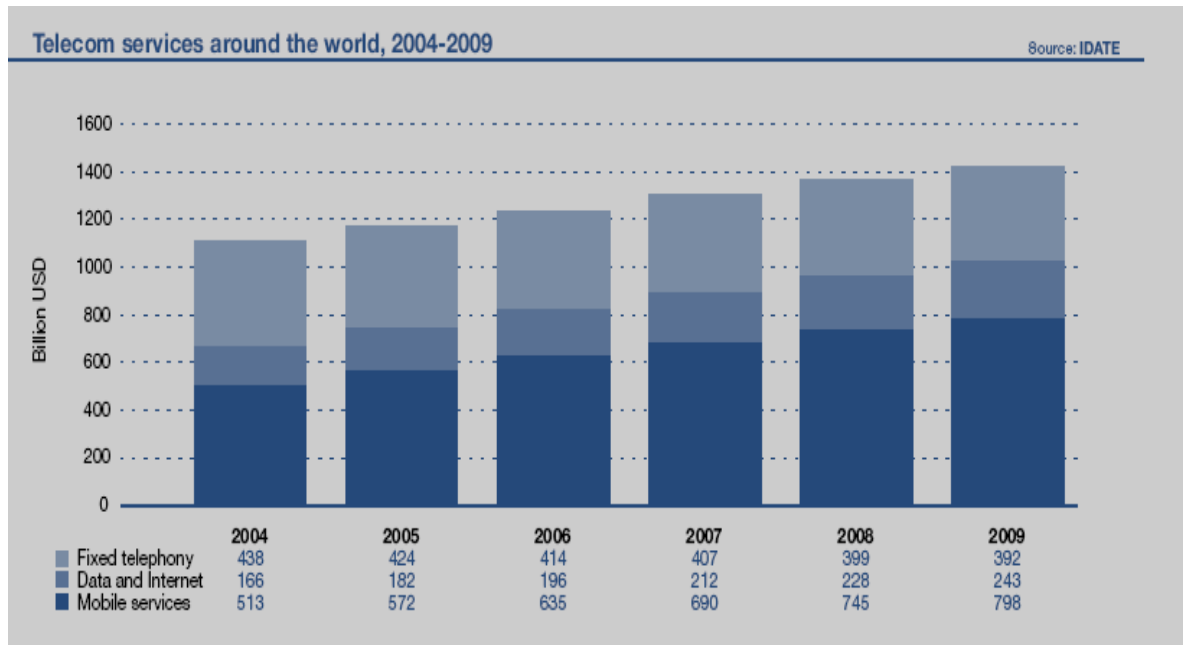


Figure -10: Telecom services around the world, 2004-2009 (IDATE, 2006)

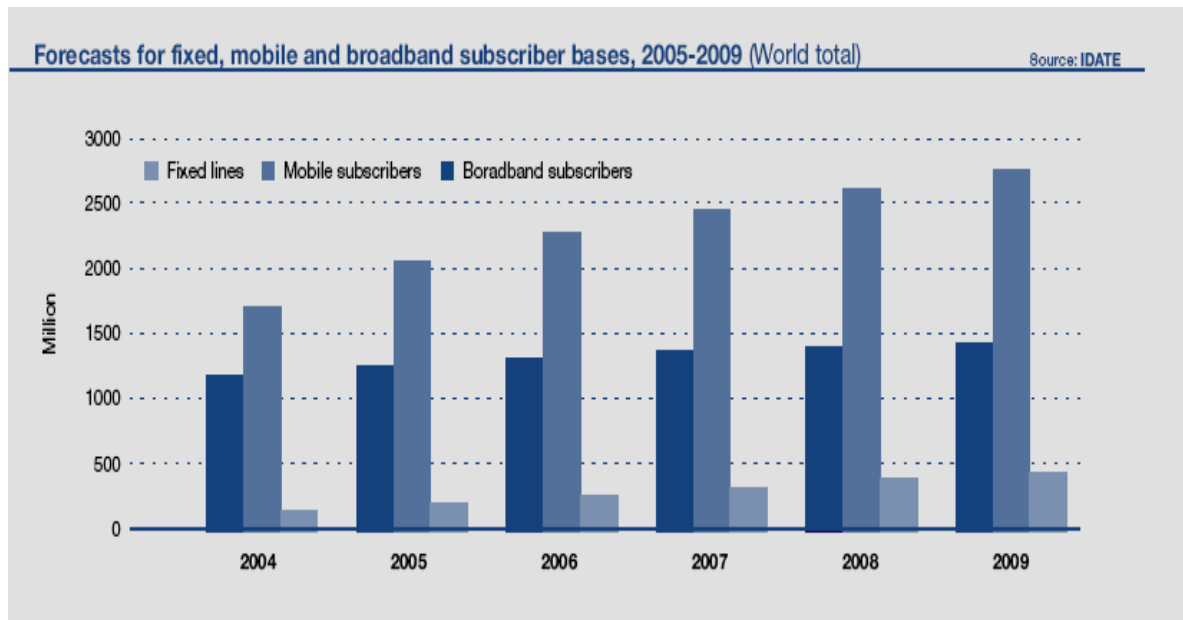


Figure-11: Forecasts for fixed, mobile and broadband subscriber bases, 2005-2009 (IDATE, 2006)

APPENDIX E

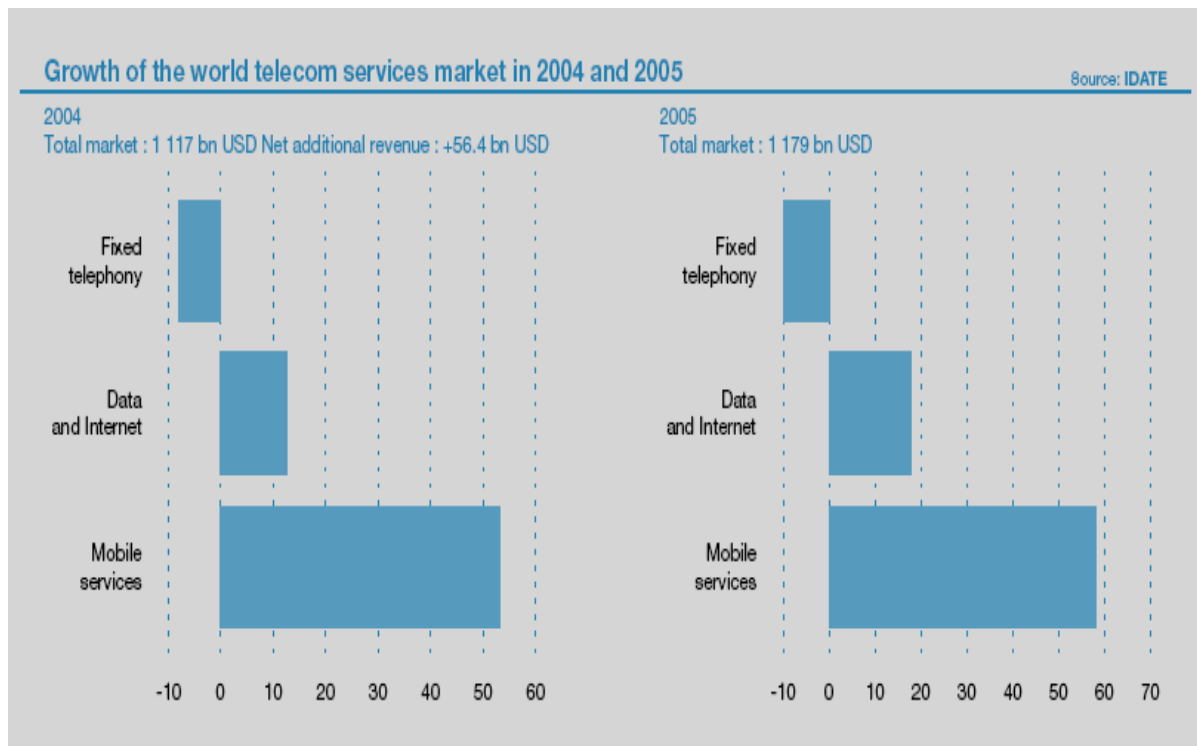


Figure 12: Growth of the world telecom services market in 2004 and 2005 (IDATE, 2006)

APPENDIX F

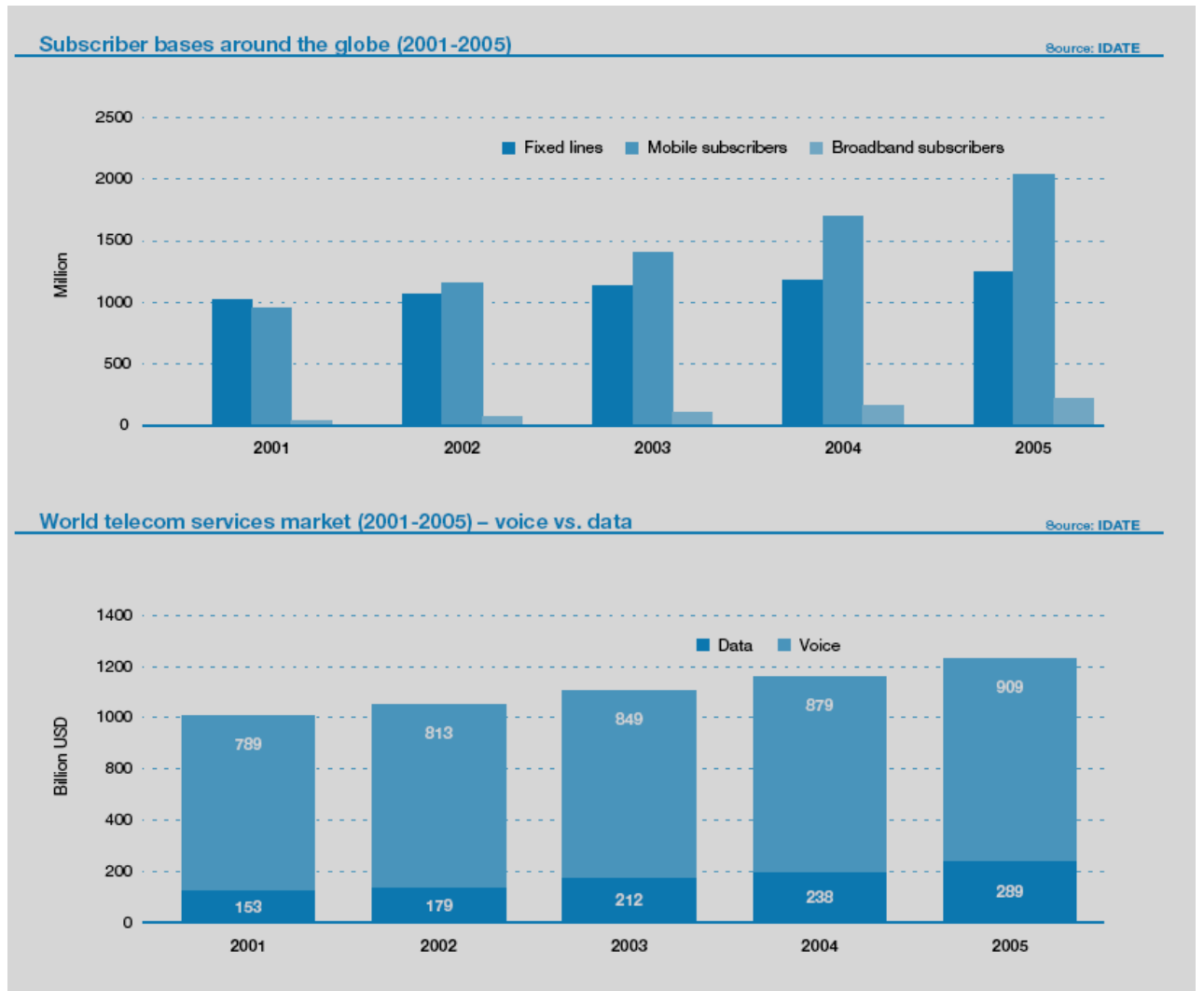


Figure 13 : world telecom services market, 2001-2005 (IDATE 2006)

APPENDIX G

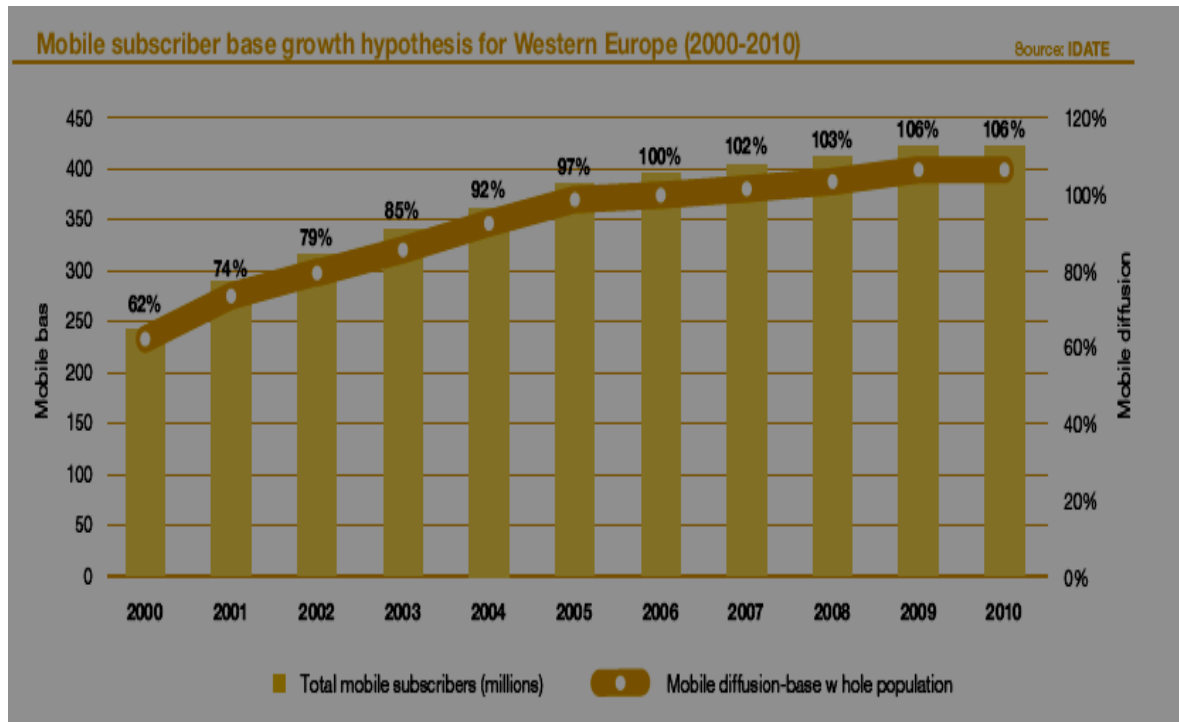


Figure 14 : Mobile subscriber base growth hypothesis for Western Europe (2000-2010), IDATE, 2006

REFERENCES

Articles and books

- Ahn, J., Cha, K., Jun, D. and Park, M. (2004), “Bridging telecommunications service: its concept and related management strategy”, *Telecommunications Policy* 28, pp.733-750
- Banerjee, A. and Ros, A. (2004), “Patterns in global fixed and mobile telecommunications development: a cluster analysis”, *Telecommunications Policy* 28, pp.107-132
- Beardsley, S., Enriquez, L. and Garcia, J.C.(2004), “A new route for telecom deregulation”, *World Economic Forum*, Oxford University Press
- Beardsley, S. and Enriquez, L.(2002), “A regulatory remedy for European broadband”, *The McKinsey Quarterly*, No.1
- Dabler, T., Parker, D. and Saal, D.S.(2002), “Economic performance in European telecommunications, 1978-1998: a comparative study”, *European Business Review*, Vol.14 No.3, pp.194-209
- Dodourova, M. (2003), “Industry dynamics and strategic positioning in the wireless communications industry: the case of Vodafone Group plc”, *Management Decision*, Vol.41 No.9, pp.859-870
- Dyck, A. (2004), “Note on Deregulation and Social Obligations: Universal Service”, *Access Pricing and Competitive Dynamics in U.S. Telecommunication*, *Harvard Business School*, 9-702-038
- *Economist Survey on Telecoms*, Beyond the Bubble, Oct 9, 2003
- Eisenmann, T. and Green, D. (2002), “The Telecommunications Act of 1996”, *Harvard Business School*, 9-802-144
- Forge, S., Blackman, C. and Bohlin, E. (2004), “FMS – Future mobile services and markets”, Interim Report for Progress Meeting 10 DEC 2004
- Gabelmann, A. (2001), “Regulating European telecommunications markets: unbundled access to the local loop outside urban areas”, *Telecommunications Policy* 25, pp.729-741
- Gandal N., Salant, D. and Waverman, L. (2003), “Standards in wireless telephone networks”, *Telecommunications Policy* 27, pp.325-332
- *Graduate School of Business Stanford University*, “The U.S. Telecommunications Industry (A): 1984-1996”, August 1999, SM-5A

- Keating, B. (2001), “Economic dimensions of telecommunications access”, *International Journal Of Social Economics*, Vol. 28 No.10/11/12, pp.879-898
- Kiki, J. (2003), “The EU framework of telecommunications organization – Basic texts (in Greek)”, Ant. Sakkoulas Publishers, Athens
- Kollmann, T. (2000), “The price/acceptance function: perspectives of a pricing policy in European telecommunications markets”, *European Journal of Innovation Management*, Vol. 3 No.1, pp.7-14
- Kothandaraman, P. and Wilson, D.T. (2001), “The future of competition: value creating networks”, *Industrial Marketing and Management*, 30, pp.379-389
- Laffont, J.J. and Tirole, J. (2000), “Competition in Telecommunications, Munich Lectures in Economics”, *Cambridge: The MIT Press*
- Lal, D., Pitt, D. and Beloucif, A. (2001) , “Restructuring in European telecommunications: modelling the evolving market”, *European Business Review*, Vo.13 No.3, pp.152-156
- Lehn, K.(2001), “Corporate governance in the deregulated telecommunications industry: lessons from the airline industry”, Paper presented at the LBS Conference on “Corporate Control and Industry Structure in Global Communications, *London Telecommunications Policy 27*, pp.729-740
- Lehr, W. and McKnight, L.W. (2003), “Wireless Internet access: 3G vs. WiFi?”, *Telecommunications Policy 27*, pp.351-370
- Li, F. and Whalley, J. (2002), “Deconstruction of the telecommunications industry: from value chains to value networks”, *Telecommunications Policy 26*, pp.451-472
- Madden, G. and Savage, S.J. (2000), “Telecommunications and economic growth”, *International Journal of Social Economics*, Vo. 27 No.7/8/9/10, pp.893-906
- Maitland, C.F., Bauer, J. M. and Westerveld, R. (2002), “The European market for mobile data: evolving value chains and industry structures”, *Telecommunications Policy 26*, pp.485-504
- Peitz, M. (2003), “On access pricing in telecoms: theory and European practice”, *Telecommunications Policy 27*, pp.729-740
- Pitt, D. and Levine, N. (2004), “Universal service and the future of regulation”, *Telecommunications Policy 28*, pp.227-232

- Porter, M.E.(1980), “*Competitive strategy – Techniques for analyzing industries and competitors*”, The Free Press
- Ratliff, J.M. (2002), “NTT DoCoMo and its i-mode success: Origins and Implications”, *California Management Review*, Vol.44 No.3
- Seaberg, J.G., Hawn, J., Dincerler, G.E., Eugster, C. and Rao, N.L. (1997), “Attackers versus incumbents: The battle for value in an IP-networked world”, *The McKinsey’s Quartelry*, No.4
- Srivastana, L. (2005), “*The development of mobile in Europe: challenges for the future – discussion points*”, Panel Discussion, IPTS Workshop on Future Mobile Services and Markets, Brussels 2005
- Steinbock, D. (2003), “Globalization of wireless value system: from geographic to strategic advantages”, *Telecommunications Policy* 27, pp. 207-235
- Trillas, F. (2002), “Mergers, acquisitions and control of telecommunications firms in Europe”, *Telecommunications Policy* 26, pp.269-286
- Whittington, R. (2001), “*What is strategy – and does it matter?*”, 2nd edition, Thomson
- Williamson, D., Jenkins, W., Cook, P. and Moreton, K.M. (2001), “*Strategic Management and Business Analysis*”, Elsevier
- Xiros, Th. and Emiri, Th. (2003), “The telecom’s legal framework” (in Greek), Ant.Sakkoulas Publishers, Athens-Komotini

Websites

- <http://www.inatelecom.org>
- <http://www.cosmote.gr>
- <http://www.vodafone.gr>
- <http://www.vodafonegroup.com>
- <http://www.tim.gr>
- <http://www.q-telecom.gr>
- <http://www.naftemporiki.gr>
- <http://www.receiver.vodafone.com>
- <http://www.e-businessforum.gr>
- <http://www.okosmostouependyth.gr>
- <http://www.idate.com>
- <http://lawdb.intrasoftnet.com>