Information Technology penetration and eCommerce developments in Greece,
with a focus on Small and Medium-sized Enterprises

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Abstract

Electronic commerce revolutionises both global economies and marketplace. A number of developed countries have demonstrated clear leadership in eCommerce, as demonstrated by the level of ICT penetration in organisations and households. However, traditional economies have experienced a much slower uptake of eCommerce. This is attributed to difficulties in enhancing the usage of personal computers and in increasing the utilisation of the Internet and Information Communications Technologies (ICTs) throughout their production mechanisms. This paper concentrates on Greece and demonstrates a number of indicators that synthesise the level of eCommerce penetration. The Greek economy is going through a major transformation and ICTs may be instrumental in its international competitiveness. The paper provides a comprehensive overview from both the production/supply (macro and micro) and consumption/demand sides. It focuses on the level of ICT penetration in Small and Medium-Sized Enterprises and concludes that eCommerce in Greece is still in its infancy. The paper provides essential background information for enterprises and policy makers interested in eCommerce in Greece and the competitiveness of the country in general.

Keywords: Internet, eCommerce, Greece, Small and Medium-Sized Enterprises, SMEs

1. Introduction

The origins of e-commerce can be traced back to electronic funds transfer in the 1970s and EDI in the 1980s. However, electronic commerce (eCommerce) emerged following the proliferation of the Internet in the late 1990s. The networked economy enabled transactions around the world and empowered organisations to collaborate virtually (Kalakota and Whinston, 1997; Timmers, 1999; Kalakota and Robinson, 2001; Turban et al, 2002). Gradually eCommerce diminishes national boundaries and internationalises trade off of products and services (Leontiades, 2001). Although the potential is there for all to explore, it is the more developed countries and the larger organisations that have the expertise and resources to invest and harness Internet benefits. Indeed, the vast majority of the world's population does not have access to the Internet and lacks technological skills and knowledge. Several countries struggle to increase Internet and electronic commerce utilisation, generating a digital divide (Seyal, Rahim and Rahman, 2000; Cawkill, 2001; Bucy, 2000).

However, a number of innovative small organisations, led by determined entrepreneurs, have demonstrated that with a minimal investment they can compete on an equal footing with larger organisations. Less wealthy regions and nations, such as India and Malaysia, gradually use the Internet to educate the young and to gain access to learning resources only available to economically privileged societies (Leontiades, 2001). This can contribute to their competitiveness and support their economic development, especially when innovation is driving these processes (Porter, 1990).

This paper examines the Internet usage and eCommerce penetration in Greece within a global perspective. It illustrates that the Greek economy is going through major transformation and that this is reflected on the use of ICTs and eCommerce for both the production/supply (macro and micro) and consumption/demand sides by synthesising published research. The paper focuses on the Small and Medium-sized Enterprises

(SMEs), as they dominate the local economy (Anonymous, 2002) whilst it explores the ICT and eCommerce policies in Greece. Although the paper does not present results generated by primary research, it brings together reliable information from a wide range of resources. It clearly demonstrates that eCommerce is gradually spreading in most developed countries, expanding the established opportunities evident in the USA and Scandinavian countries.

The paper examines the generic level of Internet and eCommerce penetration. The results are useful for policymakers at the National and European Union level, as well as for private organisations planning to expand their operations in Greece or to develop eCommerce applications. The results are also useful for researchers investigating ICT penetration and eCommerce progress in developed European countries, as similar patterns can be observed in many countries of Southern Europe. The paper initially provides a contextual and theoretical background, demonstrating eCommerce developments within the context of the Greek economy. It then provides a brief methodology before demonstrating the Internet penetration from the consumption/demand side. Suitable comparisons are made with other European and International markets. The supply/demand side focuses on the adoption of the Internet in SMEs. This paper concludes by examining policies and practices in Greece and the European Union that Internet penetration and eCommerce can enhance the local economy.

2 Research Methodology

This paper aims to bring together research results published on the area of eCommerce in Greece, from both the production/supply and consumption/demand sides. It provides a contextual and theoretical background and it synthesises secondary data in order to provide a comprehensive overview. This enables an understanding of the current situation and provides a solid base for future research. Churchill (1991) explains that secondary data 'not only helps the researcher to formulate and understand the research problem better, but also broadens the basis for which specific conclusions can be drawn'.

The research used a range of resources both on-line and off-line. A number of libraries were used both in the UK and Greece. The areas researched included eCommerce and eBusiness as well as issues related to the policy, economy and development of Greece. The Internet proved valuable source for gathering secondary data on ICT and eCommerce penetration on a global basis.

In essence the contribution of this paper is to bring together a number of indicators and statistics that clearly demonstrate where eCommerce in Greece is currently, and to explore the key factors that will determine its future. This would enable policymakers and investors to make informed decisions for the level of eCommerce in Greece and to decide suitable actions for achieving their objectives.

3. eCommerce and Greece: contextualising the industrial and market environment

The Internet has revolutionised the way businesses operate and propelled eCommerce on a global basis. eBusiness impacts all areas of daily business routine and strategy. Only organisations that use innovative ICT tools will be able to enhance their competitive advantage. Gloor (2000) demonstrates that businesses that embrace eBusiness and eCommerce properly can:

- Increase revenue through opening new and cost effective sales channels and markets
- Reduce costs by designing efficient processes and production mechanisms, as well as by optimising their logistics and sales
- Enhance customer retention, through user profiling and product personalisation by using sophisticated Customer Relationship Management techniques and software
- Improve image and brand awareness, through accessing consumers directly and demonstrating a competitive and dynamic profile
- Keep up with competition and maximise return on investment

A number of new entities have emerged to facilitate electronic intermediation. Although early research suggested that eCommerce can decrease costs for buyers and sellers, through the elimination of intermediaries from electronic value chains (Jin et al, 1999; Palvia et al, 1999) this has not materialised. Giaglis et al (2002) suggest that intermediaries provide value-adding functions that cannot be easily substituted through direct supplier-buyer dealings, and hence mediating parties continue to play a significant role in the eCommerce world.

3.1 eCommerce and eBusiness Developments: Global Perspectives

Despite the burst in the dot.com bubble that took place in early 2000s, as a result of unrealistic expectations and unproven business models, eCommerce is growing fast. In most developed economies there is a shift from off-line expenditure, banking and shopping to online, especially for goods and services, where information is critical and where the actual delivery of products is manageable. Consumer electronics, PCs and entertainment products (books, videos and DVDs and music) are the largest retail categories, whilst travel products and airline tickets grow at a fast pace. Jupiter forecasts that online retail spending in the USA will grow by 28% in 2003 to USD52 billion. By 2007, online retail spending will reach USD105 billion and account for 5% of all US retail spending, whilst the Internet will influence 34% of all US retail spending. Jupiter estimates that online retail will increase at an average annual growth rate of 21% between 2002 and 2007. In Europe, although the growth of the Internet population has reached its plateau level, online shoppers have rapidly increased from 36 million in 2001 to 52 million by the end of 2002. The eCommerce investments that innovative retailers have made are beginning to pay-off, as Internet users gain the confidence to start shopping online. The United Kingdom is the more mature market in terms of shopping online, followed by Germany (Jupiter, 2003).

The Internet provides unprecedented opportunities for innovative SMEs as it provides adequate tools to communicate and interact globally. In particular, SMEs that concentrate on services, such as consultants, editors, graphics designers, accountants, programmers etc are liberated to access the global marketplace regardless of their location. This has driven many companies to use the Internet to establish business-to-business transactions. However, the Internet also brings challenges for SMEs. Research demonstrates that initial investment, operational costs, communication standards, connectivity, and accessibility have a positive influence on the adoption decision. However, data-security concerns, network reliability, and bandwidth have a negative influence (Soliman, 2003). Saban (2001) proposes that strategically prepared companies and regions are in a better position to maximise their eCommerce investments than companies who are just tactically prepared.

3.2 Greek economy transformation and modernisation

The post second-world-war decline of the Greek economy is attributed to a systematic fall in investment, deterioration and inadequacy of infrastructure, low productivity and lack of technological adoption, which was generated by the lack of skills and training (Konsolas, 2002). The seven years of the dictatorship (1967-1974), which ended with the Turkish invasion to Cyprus, in combination with the international energy crisis and the increasing openness of the European and world competition in the 1980s, challenged the Greek economy's competitiveness and raised inflation, unemployment and low growth rates (Christodoulakis and Kalyvitis, 2001). However, since the early 1990s Greece has been going through a major transformation that affected its economy, politics and government due to several reasons, including: European Union membership and investment, political stability, internationalisation and gradual rationalisation of both the public and private sectors contributed towards this development (Economist, 2002; Papademos, 2002). Regional development and Community Support Framework funds by the European Union enabled the Greek government to invest in major infrastructure. In addition, a number of major public works were initiated for the Athens 2004 Olympic Games. These major investments, in combination with joining the European Economic and Monetary Union (EMU) in January 2001 and adopting the Euro forced the Greek economy, Government and politics, to converge with other European countries (Business Intelligence Report 2001; Dalamagas, 2000). The GDP rate of growth exceeded 4% in both 2000 and 2001, well above the European average.

The growth rates of the Greek economy owe their rapid increase to falling interest rates and increases in private sector financing (Ministry of Economics, 2002). Greece is a country without heavy industry. Hence, it concentrates its efforts to the production and export of special products of industry, agriculture, tourism and services. The industry continues its modernisation, especially in some sectors such as cement, aluminium products, textile, food-beverages, construction as well as tourism and hospitality. A number of sources of competitive advantage can be identified and exploited further for the development of the economy (Konsolas, 2002). Until recently the Greek private sector has almost exclusively been characterised by SMEs and mainly micro enterprises. The opening up of the borders with the European Union however has introduced larger organisations investing in Greek enterprises or going through mergers and acquisitions (Spanos et al, 2001; Makridakis, et al, 1997). Nevertheless the vast majority of the local enterprises are small and family owned. Voudouris et al, (2000) have identified that successful Greek SMEs take advantage of a number of success factors, including: intense specialisation in narrowly defined market segments; commitment to customer service; innovative culture and adaptation to new technologies; strong leadership and a healthy organisational climate.

3.3 Greece, eBusiness, eCommerce and the Information Society

Technology adoption in Greece has always been problematic in both private and public organisations (Cohen, 2001; Vlahos et al 1995; Tatsiopoulos, et al, 2002). The Internet utilisation in Greece is limited, particularly by micro and smaller enterprises. Medium and larger organisations inevitably use more technological solutions for their operations and have adopted the Internet widely. A number of Greek portals have also emerged recently, including: in.gr, yahoo.gr otenet.gr and flash.gr focusing on news and telecommunication products.

Many large Greek businesses (more than 500 employees) have already adopted eCommerce and demonstrated that:

- An average of 38% of large companies use electronic commerce practices; 12.5% integrated to their business and the rest 25.5% are opportunistic.
- 47% of the companies are planning to adopt electronic commerce, while 33% of those are planning to do so within the next year.
- Some sectors in the Greek market are more advanced than others. Naturally the IT sector uses integrated eCommerce practices by 22% (against 12.5% of the average) and 58% in total (integrated and opportunistic use).
- Retailing, financial, mass media, mobile telephony are preparing for integrating their services fully and maximising their electronic commerce adoption. (Papazafeiropoulou et al, 2001)

The public sector utilisation of the Internet is in its infancy though. Apart from the TAXIS systems, which gives taxpayers the possibility to submit their VAT declarations and to pay their debts electronically, there are little other established eGovernment initiatives. A number of emerging projects are supported by the European Union. Gradually all the official organisations will develop a web site, including the Prime Minister (www.primeminister.gr) with links to all ministries and public organisations.

In 2002, the government published an Information Society White Paper and developed a comprehensive programme to penetrate all levels of government. This programme aims to use ICTs as a tool for an open and effective government and for supporting competitiveness (Papazafeiropoulou et al, 2002). It also aims to use ICTs to improve quality of life for citizens, to enhance health, transport and environmental services, and to promote the Greek cultural heritage language. The government also follows the eEurope initiatives and participates in European Union projects for the digitisation of the public sector (Information Society, 2002).

The theoretical context of diffusion of innovation, as introduced by Rogers (1995, 1976) can also be observed at the macro/national level in Greece. The vast majority of the players are either at the Laggard or Late Majority adoption stages. Only few innovative players are on early adoption stage. Greece as a whole therefore is a late adopter and ideally should learn from mistakes by other nations and take advantage to advance faster. Failure to do will have major implications for its collective competitiveness.

4. Internet penetration and eCommerce: consumption/demand side

The dynamic nature of the Internet prevents research organisations from illustrating accurate statistics. It is more important therefore to observe trends and relationships in these figures, rather than absolute numbers. The Internet revolutionises consumer choice and service-delivery processes. Increasingly customers have become more sophisticated and discerning, experiencing high levels of service. Consumers in developed countries increasingly rely heavily on electronic media to obtain information about products and services, and to communicate their needs and wishes to suppliers rapidly. They become demanding, requesting high quality products as well as value for money and time. The level of online penetration in Greece and globally determine the level of eCommerce, as it is consumer demand that motivates organisations to develop their online presence and to instigate online transactions. Global indicators illustrate the level of potential international demand for exports and the key markets. Greek indicators can demonstrate the diffusion of ICTs in society and therefore the ability of consumers, employees and organisations to appreciate the potential of technology.

4.1 Worldwide Internet penetration

There has been a plethora of statistics estimating how many people are online throughout the world. However, most of these statistics are rough estimates at best. Nua.com is an authoritative online source for information on Internet demographics and trends. On September 2002 they estimated that the total number of people online was 605 million people. According to a survey conducted by the Meta Group, the highest Internet 'maturity' level and the highest eCommerce development potential is found in the countries with mature economies, such as United-States, Canada, the Netherlands, Finland, Iceland, Sweden, Denmark, Ireland, New Zealand and Australia (Carlton, 2001). The Meta group based its different criteria on the number of online financial transactions that were generated, the education level of the populations concerned and also the technological sophistication of said countries. The survey made a clear distinction between northern and southern European countries, indicating that countries such as Great Britain, Ireland and Germany have an Internet potential that proves much higher than countries such as Spain, Portugal or Greece (Carlton, 2001). This is due to their higher levels of technological sophistication as well as to computer ownership and Internet connections. The percentage of Internet users in European countries is presented in Figure 1.

Figure 1 Internet Users in European Countries (percentage)

Source: Oertel, Liong Thio and Feil, 2001:237

4.2 Internet and PC usage growth by the Greek population

The Greek population has been much slower in Internet adoption, in comparison to Northern European countries. However, Greece has demonstrated a fast and steady growth (Papazafeiropoulou, Pouloudi and Doukidis, 2001). The most recent pan-hellenic

research into the use of computers, the Internet and mobile telephone usage was recently presented by the Ministry of Development. The research was based on the largest sample ever collected in Greece (6,095 individuals aged over 15 years) (Karounos and Goussiou, 2001). The main conclusions emerged from the research are outlined and explained in the following paragraphs.

During 2001, 50% of all Greeks used mobile phones, 20% used a personal computer (PC) and 10% used the Internet. Internet penetration for the first time passed 10% of the population (over 15 years of age) at the end of the first half of 2001 and it was expected to exceed 12% by the end of 2001 (CORDIS, 2002). Results from the European Union Eurobarometer 2001 Survey conducted during the last weeks of February 2001 confirmed that 12.9% of the population were online in Greece (eMarketer, 2001). Authoritative specialist international firms had forecasted that Greece would reach this level by 2004 (McMahon, 2002). This growth can be attributed primarily to the dramatic increase of computers used in schools and throughout the education system. The number of computers per student ratio has been increased dramatically and pupils in secondary schools are trained on computers and then acquire them for home to facilitate their homework.

Gradually ICTs have penetrated all businesses, as SMEs are subsidised to purchase computers, to train their staff and develop their web presence. As a result, a large proportion of new Internet users has recently emerged, with 75% starting to use the Internet during the last two years. These programmes are partly financed by the European Commission Information Society, through an 2.8 billion Euro investment and development project that was approved in March 2001 (Ministry of Education, 2002).

Results concerning Internet usage patterns reveal that 35% of the Greek users access the network on a daily basis, 27% one or two times a week, while a further 13% on an occasional basis. Their main incentive of using the Internet is to access information (53%); use of email (23%) and for entertainment (12%). About 30% of those who have not personally subscribed to the Internet have access at work or in school, while 20% claimed it is too expensive and 13% do not own a PC. Greek users are accessing the Internet less for education (5%), purchasing (2%) and banking (1%) (CORDIS, 2002; Braliev and Yatromalakis, 2002).

4.3 Internet and PC usage by groups and segments of the Greek population

Penetration rates show significant differences amongst population segments. PC and Internet penetration is significantly higher for people between 15 and 24 years of age (Figure 2). One in two (50%) young people use a PC and one in four (25%) use the Internet. At the beginning of the school period 1999-2000, the proportion of secondary schools that were connected to Internet was 18%, while the proportion of the connected elementary schools was negligible (1%). By the end of 2001, more than 81% of the secondary schools were connected to the Internet, as well as 16% of the elementary schools. It is expected that all schools will be connected by the end of 2002. A strong predisposition has been found both for the purchase of personal computers, as well as for connecting to the Internet. Young people would like to do their homework online, as well as to download music and communicate through email (Braliev and Yatromalakis, 2002). This trend is encouraging as younger people will soon be entering the labour market and will be forcing ICT adoption for both personal and professional use.

Figure 2 Greek PC and Internet usage by age group

Source: Karounos and Goussiou, 2001:11

The level of education, therefore, is a basic determining factor for the adoption of personal computers and the Internet. About 34% of individuals with higher education level use the Internet, while the corresponding ratio for those with elementary education is only 1% (Figure 3). The large percentage of the population with lower education (37%), of which 86% belong in age groups of over 45 years old, indicates that at present there is a structural restraining factor on Internet growth. Hence, an improvement of the educational level is expected to reduce the digital divide (CORDIS, 2002).

Figure 3 PC and Internet use by education group

Source: Karounos and Goussiou, 2001:11

Figure 4 illustrates the difference amongst Greece and the European Union in terms of Internet penetration. Greece is still noticeably behind the European Union mean in respect of personal computer and Internet use (Braliev and Yatromalakis, 2002). However, if the same rate of growth is maintained, then it is estimated that by the end of 2004 Internet penetration in Greece will reach between 50% and 68%, against the European Union mean of 66% achieving convergence in this area. These estimates have been based on two different scenarios relative to the mode of Internet growth. The first scenario assumes that a constant growth rate will be maintained, where the second is based on exponential rates, equivalent to those experienced by the mobile market in Greece during its launch years.

Figure 4 Internet use in Greece and the European Union

Source: Karounos and Goussiou, 2001:10

4.4 Mobile Phone Adoption by the Greek Population

The penetration of mobile telephony in Greece is comparably high and close to the European average. EETR (2001) illustrates that the Greek telecommunications market is one of the most dynamic and profitable in Europe. The market capitalisation of the Greek telecommunication industry is valued at EURO 4.3 billion, with the mobile market being valued at EURO 1.5 billion. There are currently three mobile telecom operators: Panafon-Vodafone, CosmOTE, and STET Hellas. The mobile penetration ratio in Greece was 56% at the end of 2000, with a forecast to exceed 80% by 2004. Greek subscribers change their cellular handsets three times more often than their European counterparts and half of the mobile users change their handsets yearly. Greece has significant SMS penetration rates, whilst roaming contributes to a significant percentage of the mobile operators' revenue stream.

Greeks use mobile phones habitually and a high degree of penetration can be attributed to several factors. Firstly, access to fixed line telephony was limited, until the early 1990s. Consumers and organisations were on waiting lists for years before a fixed line was installed. The private mobile networks revolutionised the telecommunications industry and provided phones instantly. Secondly, Greeks spend a lot of time away from home and socialise outdoors intensively, making the mobile phone an invaluable tool for communications. Thirdly as most transactions are based on social interactions, through personal and family networks, mobile phones have supported commercial activities. Fourthly the innovation factor of mobile technology made phones fashion items, often with customised and personalised ring tones. Finally, the introduction of the mobile phones enabled younger members of the family to have a personal and confidential communication line, in contrast to often family-controlled fixed line phones. As wireless and 3G technology are emerging fast, there are predictions that the Greek population may reach Northern European levels (Karounos, Goussiou, 2001). This is because of the ability of all age and education-level groups to use mobile phones and services.

However, the prospect of mobile Internet in Greece is distant, as Greeks primarily use their mobiles for voice communication, rather than data exchange. Similarly to other countries, the Greek public was not very keen on using mobile Internet services or WAP, as data access via mobile telephones still confronts technical difficulties, delays and high costs. Therefore, the growth of Internet usage should not be necessarily connected with the fast penetration of mobile telephony.

4.4 eCommerce and online purchasing developments in Greece: consumption/demand side

Despite the rapid growth of Internet usage in the last few years, eCommerce in Greece is still in its infancy and presents a delay of five years in relation to main European markets. Consumer eCommerce remains largely embryonic and only 12% of Internet users or 3.5% of the Greek population buy products online. This is one of the lowest rankings in Europe, as the number of European Internet users that buy online exceeds 50%. In Greece, eCommerce as a ratio to the total volume of sales is only 0.024%, in comparison with 0.1% in more technological advanced countries, such as France and Germany, and 0.4% in the USA (Stat Bank, 2002). A number of factors were identified as the main barriers for eCommerce transactions for Greek consumers, namely:

- 25% Lack of access to credit card
- 23% Lack of Internet transactions trust
- 21% Lack of knowledge/skills
- 19% Prefer talking to salesmen prior to purchase
- 12% are undecided

Several socio-cultural issues also explain the low level of eCommerce in Greece. Consumers in Mediterranean countries tend to approach their purchasing process as a form of social exchange and interaction (Jin and Robey, 1999). Purchasing and going to the market is a social event. People often have a network of regular suppliers for goods and services and transactions are often extended to or supported by social interactions or family relationships. Products and services are frequently customised to individual preferences, whilst pricing is often adjusted at the point of sales according to the type of relationship. The language barrier and the possession of credit cards or chequebooks make online purchases difficult. Suppliers on the Internet are often regarded as rigid, distant and lifeless, whilst lack of trust, flexibility and personalisation are major disadvantages.

However, increasingly Greeks use the Internet for data collection and for some particular products which consumers may be embarrassed to purchase offline and prefer a certain degree of anonymity. In addition, educated users are using the Internet to research facts or technical information for products. Although it is very likely that purchasing will be completed over the phone or by visiting a retailer, both manufacturers and retailers can gain significant benefits by influencing the research phase. Despite the low penetration of electronic trade in Greece, it is worth noting that a number of companies undertake important investments in ICTs and eCommerce (Stat Bank, 2002).

5. Patterns of Internet usage by Greek enterprises: supply/production side

As the consumption/demand side seems unprepared to move towards eCommerce, the production/supply side is also moving at a relatively slow pace. The third pan-hellenic research for the patterns of Internet used by enterprises concluded that the majority of Greek enterprises (60%) use the network on a daily basis, as indicated in Figure 5. The main reasons for accessing the Internet by Greek enterprises is for information (94.6%) and communication (91.6%) (Technowatch, 2002). Only a very small percentage (27.7%) make purchases via the Web (Epididios, 2002). The most frequent services offered in the web pages of Greek businesses include:

- Enterprise information 96%
- Contact information 92% and
- Lists of products or services 88%

Figure 5 Frequency of Internet Services by Greek enterprises

Source: Technowatch, 2002

More than half of the Greek online enterprises (53%) offer a choice of language, usually Greek and English, aiming to attract international audiences and clientele. Whilst 30% of enterprises offer the possibility to place orders online, only 9.5% accept online payments, completing transactions off-line. Greece remains relatively unequipped for online transactions, as shown in Figure 6. Only 6.5% of the host servers are secure, allowing users to encrypt information, such as credit card data (eMarketer, 2001). This is compared with almost 30% of the European Union servers.

Figure 6: Secure servers in Greece and the EU 2000

Source: eMarketer, 2001; Cohen, 2001

5.1 ICT use by Greek SMEs

SMEs are very important for the Greek and European economies, as they represent more than 99% of total enterprises. However their importance in the economy is not always supported by their use of e-business tools. When it comes to Internet access by SMEs, as illustrated in Figure 7, percentages range from as high as 91% in Finland to a low of 54% in Greece and Luxembourg. OECD (2000) shows notably lower levels at that time, with Internet access for Greek SMEs being only 39%. Encouragingly, access to the Internet has increased considerably during the past two years for all surveyed countries, including Greece. Hence, the picture will further improve in the next few years.

Figure 7 European Internet access for SMEs

Source: EC, 2001:7

The most important barrier for Greek SMEs are the security aspect of Internet access, and in particular hacking and viruses, as illustrated in Figure 8 (EU, 2001). Secondly, speed and reliability of communications are problematic. A third barrier is lack of interest in eCommerce opportunities, mainly due to the low demand from Greek consumers and scepticism about the potential benefits of eCommerce. Insufficient ICT and eCommerce skills as well as initial and continuing costs of the Internet are also featured as key inhibitors. Finally telecommunication costs, real or perceived, are also considered problematic due to the lack of a flat rate for Internet (EU, 2002).

Figure 8 Main inhibitors to Greek Internet access

Source: EC, 2001:37

Figure 9 illustrates the Web presence of SMEs, through websites established, operated and maintained wholly or partially by SMEs themselves or by third party application providers. However, the two sets of data are not mutually exclusive as SMEs may use third party application service providers for some aspects of their web site and they may also host their own sites. Therefore, it is not possible to determine the overall web presence by aggregating the responses to both questions. Yet, it is evident that there is a low level of outsourcing for these functions. A much higher level of outsourcing might be expected in future to enable busy entrepreneurs to access complete eCommerce solutions and to compete internationally (EU, 2002).

Figure 9 SMEs Development of Internet Presence

Source: EC, 2002:9

According to a benchmarking project by the European Commission, Greece currently has the lowest levels of eCommerce, as demonstrated in Table 1 (EU, 2002). However, this research only included enterprises of between 10 and 249 employees and excluded micro-enterprises of less than 10 employees. The real picture is less optimistic and policies are required for boosting the Internet adoption in SMEs.

Table 1 SME e-business adoption rates in 2001

% of SMEs	Using ICT	Having web access	Having presence on web via own site	Having presence on web via third party web site	Making eCommer ce purchases	Making eCommerce sales
Austria	92	83	53	26	14	11
Denmark	95	86	62	N/A	36	27
Spain	91	66	6	28	9	6
Finland	98	91	58	N/A	34	13
Greece	84	54	28	8	5	6
Sweden	96	90	67	N/A	31	11
UK	92	62	49	11	32	16
Germany	96	82	65	21	35	29
Luxembourg	90	54	39	13	18	9
Netherlands	87	62	31	N/A	23	22
Italy	86	71	9	26	10	3
Norway	93	73	47	N/A	43	10

Source: EC, 2002

Greek SMEs are at the lower levels of adoption of eCommerce for purchases/procurement and sales (McMahon, 2002). Only 5% procure online and only 6% make eCommerce sales. However, Greece is the only exception of all surveyed countries in which SMEs use eCommerce more for sales, than for purchases. This might be attributable to the fact that purchasing is based on networks of interpersonal relationships, whilst SMEs primarily use the Internet to promote their products as a shopping window for the world. Figure 10 also illustrates that the majority of SMEs declare that they are using ICTs, mainly for accounting and operations management. However, just over 50% are currently on the Internet and less than 30% have their own

web site. eCommerce is weak in both sales and procurement and SMEs have yet to explore the full potential of the Internet.

Figure 10 Usage of ICT and Internet adoption by Greek SMEs

Source: EC, 2002

A fair percentage of SMEs have recently developed web sites as a mechanism to provide information about their products. Most of these developments were propelled by salesmen who convinced entrepreneurs that their businesses should be on the Internet. Often a simple web site, with few HTML pages providing static and frequently out of date information, were produced to 'test the water'. The vast majority of SMEs still lack the skills and more importantly the appetite for an eCommerce strategy.

5.2 Internet and e-Commerce use by micro Enterprises

Micro enterprises employ less than 10 employees and are usually family businesses. These are often located in peripheral regions and are critical for regional development and for creating local employment. Whereas SMEs are somehow in convergence with the EU mean, the Greek micro enterprises have much lower levels of ICT take up, as illustrated in Table 2.

Table 2 ICT use by Greek micro enterprises

Number of employees	PC use	Internet Access
Sole proprietors	24%	10%
2-5	32%	14%
6-10	71%	35%

Source: GSRT, 2002

Greek micro enterprises differ with SMEs on the degree of Internet presence. Almost 40% of larger size SMEs already have a website, against 2.6% of micro enterprises. The real estate sector of micro enterprises has the highest rate of PC usage (81%) and Internet presence (43%), whilst hotels and restaurant enterprises have the lowest percentages (8% and 4% respectively). The manufacturing and transportation – communications sectors also have a high ICT usage (GSRT, 2002).

The main inhibitors for the exploitation of new technologies are lack of knowledge, poor management skills and qualifications for both entrepreneurs and employees. Ignorance and a lack of interest are also critical factors as a large percentage (45%) of enterprises surveyed declared that they have no difficulty in ICT use, but they just do not want to employ it. This is combined with the companies that did not answer at all (19%) and can

reach a total of 64%. Hence the overwhelming majority of micro SMEs have failed to identify additional benefits gained by using ICTs.

6 Information Society, eBusiness and eCommerce policies in Greece

The EC (2002) recognises that the fact that SMEs lag behind larger enterprises with respect to the take up of ICT and e-business, this is a matter of political concern and calls for remedial action. However, they appreciate that policy actions in support of e-business and ICT adoption for SMEs should be based on sound knowledge of the problems to be solved. As explained in section 2, the Greek economy, policies and government have been going through a strategic transformation in the last decade. The Information Society (1999) provided a comprehensive strategy for Greece and identifies that ICTs rapidly change the way we work, play and communicate. They also transform the basis of economic competition and formulate new conditions and opportunities for growth, prosperity and quality of life. The aim of the Greek government is to reduce inequalities on-line and to diminish the digital divide. Its overall strategy is based on some basic principles: equal opportunities and access for all. These can be achieved through the creation of an environment that is conducive to entrepreneurship and innovation whilst safeguarding personal freedoms and supporting the operation of democratic institutions. A number of goals were set to implement this strategy, namely:

- Offering better services to citizens and firms, through the modernisation of the state operation, and greater access and transparency.
- Achieving a better quality of life, through the application of ICTs in health & welfare, the environment and transport.
- Creating an educational system adapted to the digital age, by developing the use of new technologies in education and networking of schools and universities.
- Realising faster economic growth, through fostering the creation of new firms, new sectors, and increasing productivity and competitiveness.
- Increasing employment, by supporting the creation of new jobs, upgrading skills, and developing new forms of work.
- Promoting Greek culture and civilisation, through the documentation of cultural heritage, protection of the Greek language, and contact with Greeks abroad.
- Encouraging the use of new technologies in mass media, by creating an appropriate regulatory framework and safeguarding pluralism and free expression.
- Achieving equal participation of all regions of Greece in the Information Society, through decentralisation and the encouragement of regional and local initiatives.
- Developing a national communication infrastructure, through new investments, regulatory reforms in telecommunications and universal service requirements.
- Protecting the rights of citizens and of consumers and upholding democratic institutions and participation in the digital age.

These policies and goals are constantly updated and reformulated to address the emerging challenges and opportunities (Information Society, 2003). In addition, a number of National and European specific programmes are currently implemented to support these policies and goals, to stimulate usage of the Internet and eCommerce by SMEs and to facilitate their transition towards the eEconomy, as presented in Table 3. However, the main responsibility for the transition towards the e-Economy remains with the enterprises themselves (McMahon, 2002). It is therefore encouraging that these programmes have already attracted an interest of more than 13000 Greek SMEs organisations.

7. Discussion and stakeholders analysis

The analysis clearly demonstrates that both demand/consumption and supply/production in Greece are in their early stages of their ICT and eCommerce adoption circle. There is, however, evidence that demonstrates that the growth of the ICT and eCommerce usage is greater than in mature European markets and hence the digital divide gap is being reduced. To the degree that ICT adoption determines national competitiveness, the Greek economy needs to move faster to explore the entire benefits of the ICT and eCommerce opportunities.

Stakeholders are organisations, groups, or individuals that have a major interest on the process and also include both those who affect and those who are affected by the developments (Wheeler, 1997). Some of the stakeholders have more influence, depending on their resources and administrative power (Vincent, 1990). Stakeholder analysis illustrates the different groups of people who can influence the development of eCommerce and ICTs in Greece. This allows a better understanding of the key participants in the process, their contribution and potential influence. Four principle stakeholders have been identified in the paper, namely the Greek public/consumers, suppliers/investors, governmental agencies/policy makers and international organisations.

The Greek **public/consumers** effectively determine the level of demand for eCommerce services. Hitherto, eCommerce in Greece is limited in comparison to northern European countries due to a number of reasons, including:

- low level of ICT usage;
- lack of credit cards;
- domination of English as the web and ICT languages;
- and purchasing culture based on personal relationships and networks.

Currently therefore, within the innovation diffusion theory framework, innovators and early adopters (counting for less than 15% of the population) use the Internet and only innovators for eCommerce. However, gradually Greek consumers are moving on. As more school and University graduates come to the marketplace, with computer skills as part of their education, the country will experience much higher levels of ICT penetration and eCommerce in the very near future. This is particularly the case for younger generations as well as for young executives that work with international companies and use the Internet extensively. With expectations that by the end of 2003, 20% of the Greek population will have Internet access a number of online services are emerging to propel eCommerce. This is evident by the gradual transformation of banking, where most of the banks are now fully operational online and aim to facilitate transactions and to reduce waiting times at their branches (GBN, 2003).

The further development of Greek portals and the establishment of online marketplaces, such as in.gr, will be critical for eCommerce in Greece, as they will point people to relevant content in their proximity. In addition, to the degree that special offers and good/secure service is available, online users will be willing to migrate distribution channels to online players. This is evident with airlines such as Easyjet, which sells the majority of its tickets online even for the Athens routes. There are clear similarities to the patterns of eCommerce adoption in major markets few years ago.

Against this background, **enterprises** need to make some difficult decisions with regards to their ICT investments and their Internet adoption. Unless a significant proportion of their customers are willing and able to purchase their products online enterprises are

understandably reluctant to invest heavily on eCommerce. It is therefore proposed that enterprises in Greece initially need to focus their ICT investments to support their Business to Business (B2B) transactions, where a number of benefits can be clearly identified through the reengineering of their interactions with their suppliers and institutional customers. By enhancing their value chain they can make significant cost savings and expand their catchment area. Depending on their sector, Business to Consumer (B2C) web presence can also facilitate their interaction with consumers through information provision and gradually fully transactional eCommerce sites. A number of enterprises have emerged in the last few years, selling ICT equipment, books, music, food and wine, flowers and travel products online. They address primarily the younger and technologically advanced markets. In addition, several enterprises provide Greek products internationally, often targeting Greek immigrants living abroad. As organisations that register a dot.gr domain must be legal and VAT-registered entities, there is a certain degree of security with transactions made with these entities.

However, as the consumer behaviour of the Greek public is primarily influenced by personal relationships and face to face contacts, enterprises need to develop multi-channel strategies where they support sales consistently across all their online and off-line channels. Achieving consistency between all channels, adding value for money and time, and supporting personal relationships with prospective customers will be critical for their success.

State/government intervention is also important for the adoption of eCommerce in Greece and the public sector will have to undertake a number of tasks, including:

- Educate and train people on ICTs and eCommerce through schooling, professional training and adult education
- Develop a regulatory framework for the emerging electronic marketplace
- Provide incentives for SMEs and micro-enterprises to adopt emerging ICTs and to take advantage of eCommerce applications
- Reengineer the public sector services and enhance its communications with both consumers and businesses
- Provide the infrastructure to reduce the digital divide between different age groups, social classes and regions

International organisations including the European Union and OECD also play a critical role by introducing policies and measures that enable governments and public sector agencies to implement them at the local level. A wide range of funding opportunities are also available through international organisations which often provide incentives for other stakeholders to invest on ICTs and eCommerce. The European Commission in particular has provided significant budgets for peripheral regions and Small and Medium Enterprises to implement innovative technologies.

ICT adoption and education should be identified as a significant factor for the future competitiveness of the Greek economy. Investment on both areas should be of high priority and should bring dividends in the form of economic growth, regional development and improvement in quality of life.

Table 3 National ICT programmes in specific focus areas

Policy Area	E-business Awareness and Training	Programme Title	Network Yourself
Greece is targeting 50,000 SMEs under the 'Network Yourself' programme which is part of their wider 'Go Digital' campaign. The main aim of this is to help companies understand the importance of the Internet and to create digital awareness			
Policy Area	E-business Awareness and Training	Programme Title	EBusiness forum
e-business forum is providing a constant mechanism of consultation between government, academia and industry into implementation of e-business. As well as helping with policy-making on e-business issues, it is also raising awareness across the whole spectrum of Greek SMEs. A website has been put up to provide a range of information required by businesses wanting to trade in the digital economy. This includes e-business articles, links to consulting houses, links to business facilitators, information on European and regional e-business programmes and subvention opportunities.			
Policy Area	Ebusiness Awareness and Training	Programme Title	Greek Go Digital Programme
Tuition is provided by trainers who are selected, trained and sent into SMEs by regional facilitators who are associated with the local universities and chambers of commerce. This is a scheme being run by the Greek Research and Technology Network. The aim is to transfer knowledge to the company as a whole by having a trainer on site. The relationship built with the trainer means that the SME can benefit from a much longer term, personalised support mechanism			
Policy Area	SME Support Networks	Programme Title	Capital of Entrepreneurial Participation High Technology
A special fund called Capital of Entrepreneurial Participation of High Technology has been set up to support new enterprises that are technology and knowledge intensive and for the encouragement of new entrepreneurs			
Policy Area	SME Support Networks	Programme Title	Electronic Commerce Centres (ECC)
Currently there are 14 Greek ECCs up and running. The centres are there to provide information to all those involved in commercial transactions and they will assist SMEs with: Access to information; Electronic promotion and advertisement; Digital processing of commercial transactions through the Internet. Each ECC has defined a target for e-business penetration in its region in terms of awareness, training and paid service			
Policy Area	Helping SMEs to participate in e-market places	Programme Title	Incentives for SMEs to cluster and collaborate over electronic commerce and electronic data interchanges
The Greek Ministry of Development provides incentives for SMEs to cluster and collaborate over electronic commerce and electronic data interchanges. The measure is aimed at supporting specific business procedures online that will attract a large number of Greek SMEs to use eCommerce. The projects cover many areas of collaboration including: Implementing innovative applications of existing technologies; techniques and methods of electronic commerce; Combining two or more technologies of eCommerce; Upgrading or automation of one or more basic operations of commerce (product promotion etc) Promoting electronic collaborations among similar companies or complementary fields; accruing actual consequences in the competitive advantages of company-users.			
Policy Area	Helping SMES to participate in e-market places	Programme Title	Incentives for the creation of e-marketplaces
The Ministry for Development in Greece has created a number of incentives for the creation of e-marketplaces. One of the actions concerns the encouragement of business groups to create eMarketplaces. The emphasis is on the formation of sustainable long-term commercial collaborations, as well as on the creation of suitable conditions for the processing of transactions.			

Source: EC, 2002:41

8. Conclusions

This paper examined the generic level of ICT penetration and the level of eCommerce both for the production/supply and consumption/demand sides. The results are critical for decision-makers in both the private and public sectors as they determine both public policy and investment decisions. Greece presents some of the lowest levels of ICT and Internet adoption in the European Union for both consumers and enterprises. It is apparent that the use of eCommerce is in embryonic stage. The adoption of new technologies in SMEs is generally lower than other European countries, mainly due to lack of awareness and IT skills. Moreover, low eCommerce transactions confirm that Mediterranean consumers are in the habit of buying through interpersonal networks.

From the production point of view, this situation threatens the future competitiveness and the ability of Greek SMEs to develop and commercialise their products. Ultimately this can jeopardise regional development and economic growth. From the consumption point of view, consumers and citizens seems less able than other European nations to access information, interact and purchase products on-line. However, there is real potential for growth propelled by the education system, which encourages both school and university students to use the Internet. The evidence demonstrates that younger people in Greece are almost as prolific computer users as in northern Europe.

The European Commission and the Greek government are developing initiatives and policies which aim to encourage the widespread adoption and adaptation of ICTs. Initiatives, such as the Go-Digital, have already made an impact. There are some concrete results in terms of Internet and eCommerce use, while prospects for future adoption and use seem to be optimistic. Statistics in this fast moving and fluid area are notoriously unreliable. Nevertheless the picture emerging is one of an electronic market that is developing fairly quickly. This is a primarily a result of three key factors, namely: the new generations emerging through the education system with ICT skills embedded in their knowledge base; the expansion of international investment in Greece and the subsequent transfer of know-how and technologies; and finally public sector and European Union policies and incentives that allow smaller organisations to invest in ICTs and eCommerce. However, return on ICT investment is still limited in comparison with other more advance regions and hence entrepreneurs are cautious in their approaches. A number of indicators therefore need to be developed and monitored in order to ensure that the Greek production/supply and the consumption/demand do not lag behind their European counterparts.

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