FACTORS AND IMPACTS IN THE INFORMATION SOCIETY
A PROSPECTIVE ANALYSIS IN THE CANDIDATE COUNTRIES

REPORT ON CYPRUS

Authors:
Adrienn Kovács, Chrys Margaritidis, Péter Fákó
ICEG EC, Hungary

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PREFACE

The Institute for Prospective Technological Studies (IPTS) of the Directorate General Joint Research Centre of the European Commission contracted the International Centre for Economic Growth, European Centre (ICEG EC) to act as the coordinator of a consortium of 11 research institutes to carry out this project.

The main objective of the project was to provide a series of national monographs studying the development of the Information Society (IS), including both the positive and negative impacts, in each of the candidate countries. These monographs offer an assessment of the strengths and weaknesses of each country regarding the development of IS, and a view on their possible outcomes; both strongly rooted in factual quantitative data. They provide a clear, contextualised, multi-factoral and multi-causal picture of the input factors that contribute to the success or failure of IS developments, and the relevant output parameters that support mid- and long-term impacts on economic growth, employment and other relevant aspects of the future of each country. Each monograph concludes with a set of alternative scenarios for the development of IS in that country.

This report aims to study the factors and impacts of the Information Society in Cyprus. The report reflects the research results, comments and opinions of the team of authors. It does not necessarily reflect the opinion of the European Commission. It is organised around 9 themes – economy, demography, government policies, industrial development and competitiveness, relevant economic activity, IST penetration rates, institutional capacity and regulatory background, education, and culture. The section on each of these themes concludes with a specific SWOT analysis. Finally, a general diagnosis is made of Cyprus´s potential for IS developments, followed by a brief section on possible scenarios for the future and policy recommendations.

A Synthesis Report was also prepared by the Project Coordinator, the International Centre for Economic Growth, European Centre (ICEG EC), on the basis of all the country studies. This offers an integrated and prospective view on the future outlook for the Information Society in the Candidate Countries and can be found on the FISTE (Foresight in Information Society Technologies in Europe) website: http://fiste.jrc.es/

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COUNTRY PROFILE

Reference: http://a1-bookmarks.com/images/cyprus-map.gif

General information:[1]

Area: 250 sq. km (of which .355 sq. km are in the Turkish Cypriot area)
Population: 767 314 on 1 January 2003 (figure does not contain over 115 000 Turkish settlers residing in the Turkish-occupied part of Cyprus).

GDP per capita at PPS (2002): 18 500 EUR (Greek Cypriot part)
GDP growth rate 2002: 2 % (Greek Cypriot part)
Currency: Cypriot pound (CYP); Turkish Cypriot area: Turkish lira (TRL)

In the Country Report, unless otherwise specified "Cyprus" refers to the Greek Cypriot part.

[1] http://www.cia.gov/cia/publications/factbook/geos/cy.html#Intro

A. NATIONAL AND REGIONAL ECONOMY

A.1. Introduction

The island of Cyprus is the third largest in the Mediterranean. Its area is about 9.251 square km, and it is situated in the eastern part of the Mediterranean Sea. Not only geographically but also economically we could say that it is at the crossroads between Europe, Asia and Africa playing the role of a bridge. Its main economic activities are banking, tourism, and merchant shipping. Over the years the Cypriot economy developed step by step into a modern economy, with dynamic services, industrial and agricultural sectors and advanced physical and social infrastructure.[2] Its economic performance in the past 25 years has been impressive, achieving an enviable growth record. Thanks to its good economic management, it has ensured macroeconomic stability. Per capita income among Cypriots[3] is higher than in Greece or Portugal. The inflation rate is close to the European Union (EU) average. The main engine for growth is tourism.

Cyprus is a functioning market economy with a stable macroeconomic situation. It is probable that it will be able to cope with future competitive pressures within the European Union. It is classified by the World Bank as a high-income country. GDP per capita amounts to EUR 18,500, which is about 80% of the EU average. This makes Cyprus to be on the first place among all Candidate Countries. The unemployment rate is low, being around 3.4% in 2002. This is mainly due to the Cypriot economy's success, the pursuance of sound macro-economic policies and to the existence of a dynamic and flexible entrepreneurship backed by a well-educated manpower. Besides, the economy gained a lot from the close co-operation between the public sector and the social partners.

During the nineties Cyprus has intensified its economic links to Europe. The European Union became the country's largest trading partner. In 2002, the EU had a share of 54% of Cyprus's exports and 52% of Cyprus's imports. However, these values are not so good if we take into account all of the acceding countries. In this case, Cyprus's links to the EU are rather "relaxed", being situated on the 6th place from the import from the EU point of view, and on the last place regarding the exports directed to the EU, as it is shown by Table A1., below.

Table A1: EU share of foreign trade in regional comparison (average of 1990 – 2001)[4]

Country	Imports from the EU	Exports to the EU
Cyprus	50.22%	39.31%
Czech Republic	60.53%	62.60%
Estonia	58.40%	59.79%
Hungary	59.65%	68.74%
Latvia	50.20%	52.50%
Lithuania	44.14%	42.52%
Poland	64.08%	67.40%
Slovakia	43.76%	49.58%
Slovenia	67.39%	64.31%

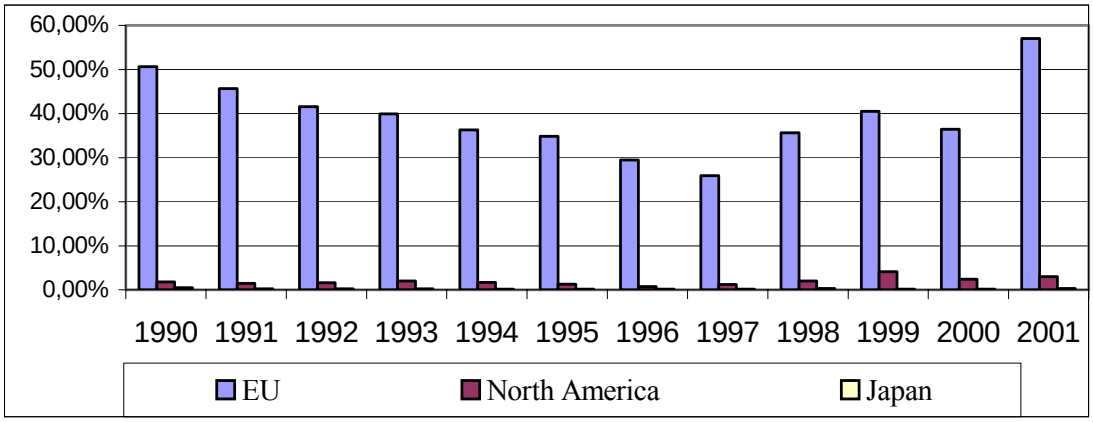
[2] http://www.europa.eu.int/comm/enlargement/cyprus/index.htm

[3] However, it refers only to Greek Cypriots.

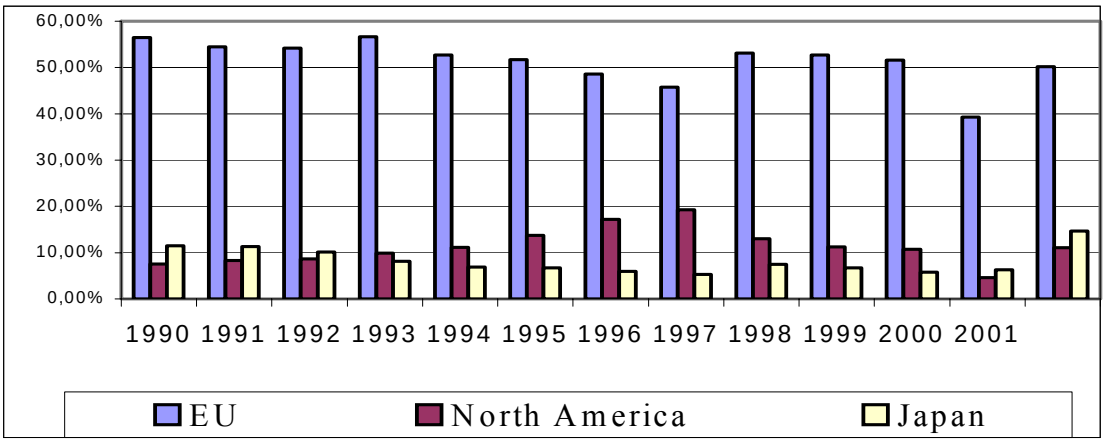
[4] **Most data in this report are from the Eurostat and World Bank databases. The source is therefore not indicated below each table and chart, unless it is other than Eurostat or the World Bank**.

Examining the evolution of the foreign trade by main partners over the last decade, we can indeed see that the EU is by far the most important trading partner. The import and export shares of the main trading partners are presented below, on Graph A1, and Graph A2.[5]

Graph A1: Import share of the main trading partners of Cyprus



Graph A2: Export share of the main trading partners of Cyprus



We can see from the graphs above that the EU-imports declined steadily in the first part of the period, until 1997 and since then they were rising constantly, being above the 1990 level in 2001. This could be explained by the fact that the accession negotiations started on 30 March 1998. The pattern of the exports share is somewhat not that clear as those of the imports share. Still, we can observe the same decline between 1993 and 1997 and growth after this. The slowdown of the exports towards the EU from 2000 is most probably due to competitiveness or other issues, but in no case could signal a slackening relationship between Cyprus and the Union. The achievements of the Cyprus economy have been recognized by the European Council, which invited Cyprus to join the EU at the Copenhagen summit of December, 2002.

The services sector, and in particular tourism, has been the primary source of this impressive economic performance. Almost two thirds of the population (65%) is employed in this sector. Although industry and agriculture still employ about 30% of the population, their contribution

[5] Exact values can be found in the Annex , Table A13.

to the GDP is much lower (21% for industry, 4% for agriculture) and it is declining every year. In 2001, almost 3 million tourists visited the southern part of the island. The share of trade and tourism amounted to 22% in 2001. The Cypriot economy benefits from productivity gains regarding the services. This sector shows an impressive growth during the last years.

However, we cannot neglect the historical developments of the island. It is divided ethnically into two parts: the north is predominantly Turkish and the south is predominantly Greek. The economic situation in the northern part of Cyprus is weak. Real output growth of its population (around 200.000 people, which means about 25% of the whole population) decreased by 3.6% in 2001, after a 0.6% fall in 2000. Thus, per capita income continued to decline in 2001. The economic crisis aggravated the income gap with the rest of the island. The GDP is estimated around EUR 4.500 per capita in 2002. The northern part of the island has no independent monetary policy, but it uses the Turkish Lira as its currency. Consequently, high inflation is imported from Turkey. Trade is also heavily dependent on the Turkish market. The tourism potential remains largely under utilized. Thus, Turkish Cypriots cannot benefit from the advantages stemming from the Association Agreement.[6] However, on the whole, the country is successfully meeting the challenge of harmonization with the *acquis communautaire*. Robustness and macroeconomic stability characterize its economy. This is evidenced by the favourable evaluations of the European Commission, the International Monetary Fund and other international organizations.

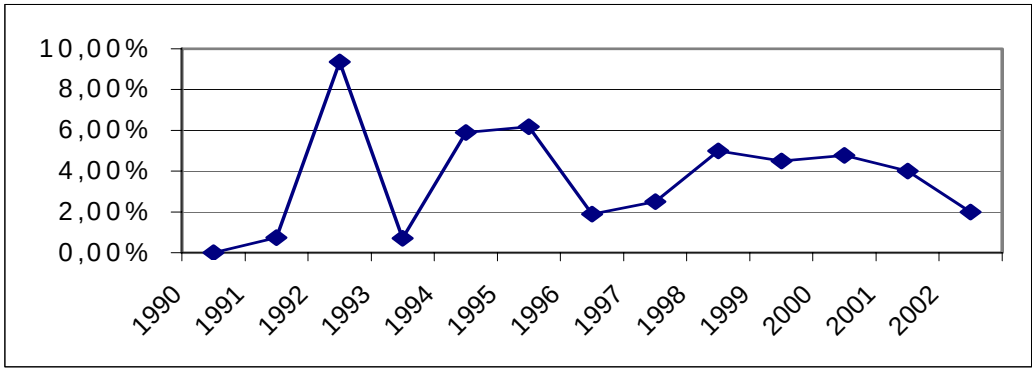
A.2. Economic growth in the last decade

The Cyprus economy recorded approximately 4.5% real GDP growth between 1995 – 2001 (also see Graph A3 on the next page), compared with an average growth rate of 5% in the accession countries and 2.4% in the Euro area.[7] This growth was achieved in an environment of full employment conditions, low inflation, and strong currency, as well as a relatively low fiscal deficit. According to a recent bulletin of the European Central Bank, Cyprus's per capita GDP has reached nowadays 88% of the corresponding Euro area average, while average per capita GDP in the accession countries is less than 40% of the Euro area average. Steady and high growth levels have been driven mainly by domestic demand. The high growth in tourism has also contributed significantly. Macroeconomic stability, the progress achieved in the negotiations, provides a strong foundation for the accession of Cyprus to the EU, and the country's participation in the Euro area soon after accession.

[6] In 1994, the European Court of Justice ruled that administrative co-operation "is excluded with the authorities of an entity such as that established in the northern part of Cyprus, which is recognized neither by the Community nor by the Member States" (C-432/92).

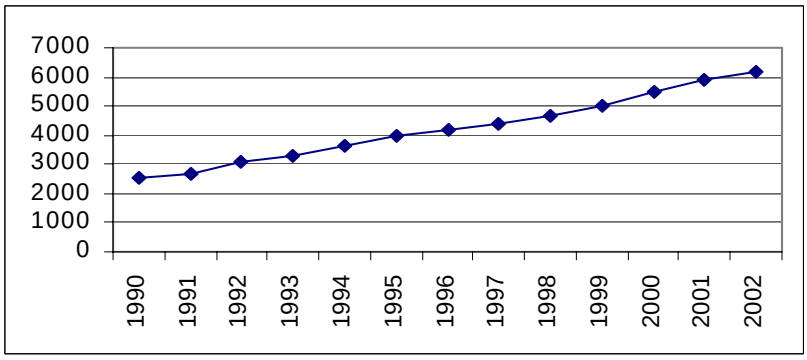
[7] Exact values can be found in Annex Table A14.

Graph A3: Annual Real GDP Growth (%)



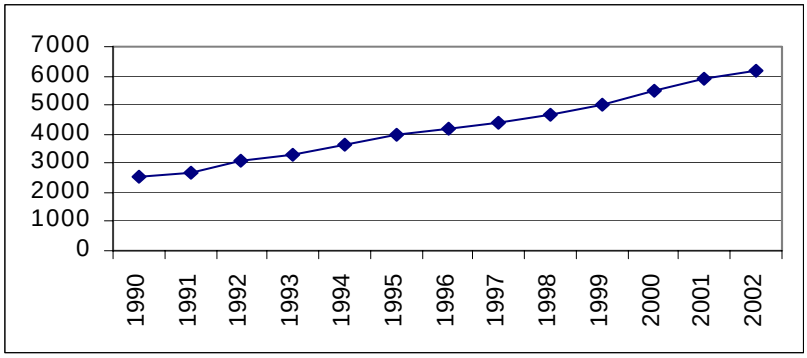
Having a glance to the last decade evolution of the real GDP growth, we could say, that it was rather hectic, with a strong variation especially in the first part of the period. Starting with 1999 a slight slowdown is observable. It could be said that one of the reasons might precisely be the convergence towards the EU and the strengthening links with this region, from which – in this case – the Cypriot economy does not really benefit. Hopefully this is only a temporary state and it will pass together with the acceleration of the EU growth. By that time, Cyprus will already be a member of the Union. On the other hand, the slowdown might also be due to the political instability met in the Eastern Mediterranean area and Iraq, which influenced negatively the overall world tourism towards these zones. Being close to these regions and having a major tourist industry, it is natural that Cyprus was negatively affected by these political evolutions. Another reason for the slowdown may be the decrease of the foreign demand exaggerated after 11 September by a strong decline in tourist arrivals. In 2002 GDP growth is estimated to have slowed down to 2%. The weak performance of the external sector is the main factor underlying the growth deceleration, because exports, and especially tourism services, dropped more than previously anticipated. In these circumstances, domestic demand has led growth, despite a decrease of the pace of private consumption expansion, because consumer confidence was affected by international uncertainty. Public consumption and investment growth were rather strong, largely due to one-off factors. The international tensions might further delay the recovery of the external sector. Thus, GDP growth is forecasted to remain under the potential in 2003 at about 2.0%. In 2004, EU growth is projected to accelerate and tourism growth expected to increase once more. However, we have to mention that this forecast is subject to more than the usual uncertainty and that the risks concern mainly the tourism sector, which remains the most important source of income for the Cypriot economy.

Graph A4: Nominal GDP levels (million CYP)



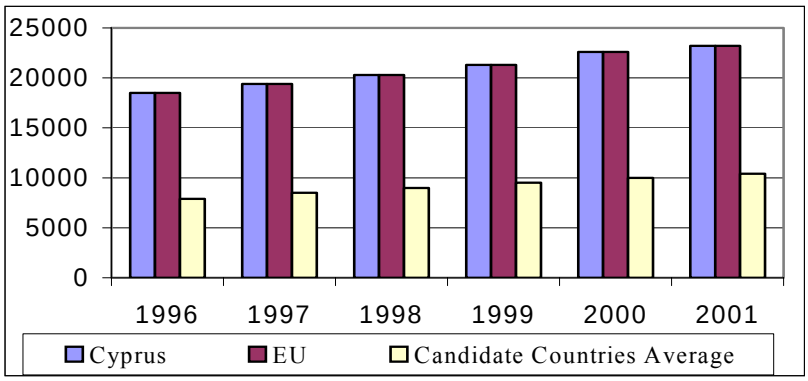
Graph A4 presents the nominal GDP level from the same period. This clearly shows a linear upward trend. In spite of this, we cannot infer too much from this graph, because of the well-known economic fact that any inference based on nominal, rather than real values can lead to erroneous conclusions. On the other hand, if we would further like to examine the relation between the changes in GDP and another macroeconomic indicator then we have to detrend the series because of stationarity, spurious correlation and other econometric issues.

Graph A5: GDP/capita at PPS



Graph A5 indicates the GDP per capita measured by the purchasing power standard. This has an equilibrated steady increasing pattern and it shows an average of 3.79% growth for the 1996–2001 period. Together with Malta, Cyprus is a special case of the accession countries with respect to the political situation. The collapse of the socialist state did not take place in neither of them. In the ten Central and Eastern European (CEE) countries when the transition towards the market economy started, the GDP started to decrease due to the early phase of some structural reforms. But in Cyprus, both the nominal GDP level and the GDP per capita measured by the PPS could have a steadily increasing pattern, with an equilibrated, healthy growth during the last decade. Graph A6, below compares the GDP per capita of Cyprus, the EU and the average of the other candidate countries on a PPS base. The Cypriot real income per capita is about 80% of the EU real income per capita every year for the 1996–2001 period. From this point of view the country clearly meets the Maastricht criteria. This value allows Cyprus to be the leader of the acceding-countries group.

Graph A6: GDP/capita at PPS: in Comparison



A.3. GDP by sectors: supply side composition of gross domestic product

Before entering into analysis let us present what is and what is not included in each of the main sectors of the national economy. *Agriculture* comprises the virtual agriculture, hunting, forestry and fishing activities. *Industry* includes the mining and quarrying, manufacturing, electricity, gas and water supply as well as the construction activities. The *services* sector is made up of the hotels and restaurants activities, transport, storage and communication, financial intermediation, public administration and defence, education, health and social work and other community social and personal services. Wholesale and retail trade are treated separately, because this is not part of the services activities, even if it can be included in the tertiary sector[8]. Private households with employed people, the imputed bank service charge, import duties and value added tax are not included in the analysis. Those excluded activities are represented on the graphs under the name of "Other Activities".

Graphs A7 and A8 present the evolution of the supply side composition of the nominal income as well as its structure. Graph A7 clearly shows that the most dynamic and the most important sector of the Cypriot national economy is the services sector. This is followed by the industry, the wholesale and retail trade and finally by the agricultural and natural resources exploitation activities. Graph A8 presents the real growth pattern of the different sectors of the Cypriot national economy between 1995– 2000.[9] The situation is not that "shiny" anymore. The agriculture shows negative growth indicating that it is not a very reliable sector of the national economy from the overall economic growth point of view. Of a total land area of 925,000 hectares, agricultural land was only about 200,000 hectares in 1996.[10] Irrigated land which permits the intensive production of fruit trees, vines, and citrus fruit and vegetables amounts to only 20% of agricultural land.[11] The scarcity of water and the falling annual precipitation represent major problems. Another problem is connected with the size of the farms. The average size of holdings was 3.5 hectares in 1997. 30% of the total holdings were less than one hectare. The average size of holding has been falling largely as a result of the inheritance system. Farms tend to be fragmented and dispersed. (Susan Senior Nello, 2000). The industry and the wholesale retail trade activity obviously show more or less similar pattern. The steadiest sector is that of the services. A combined analysis of graphs A7 and A8 shows a constant and equilibrated growth of this variable until 1999, and decline in growth in 2001.[12]

[8] Our classification differs slightly from the primary-secondary-tertiary way of dividing the activities that make up the national economy.

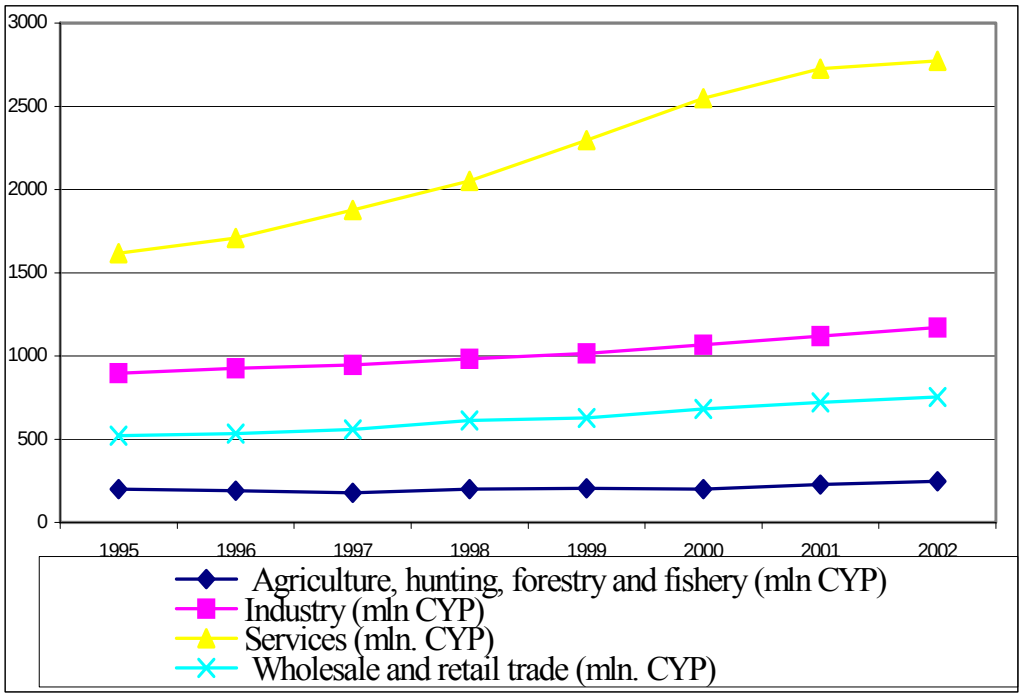
[9] The shortness of the period is due to the fact that there were no available data for the GDP deflator (taken from the IFS) after 2000.

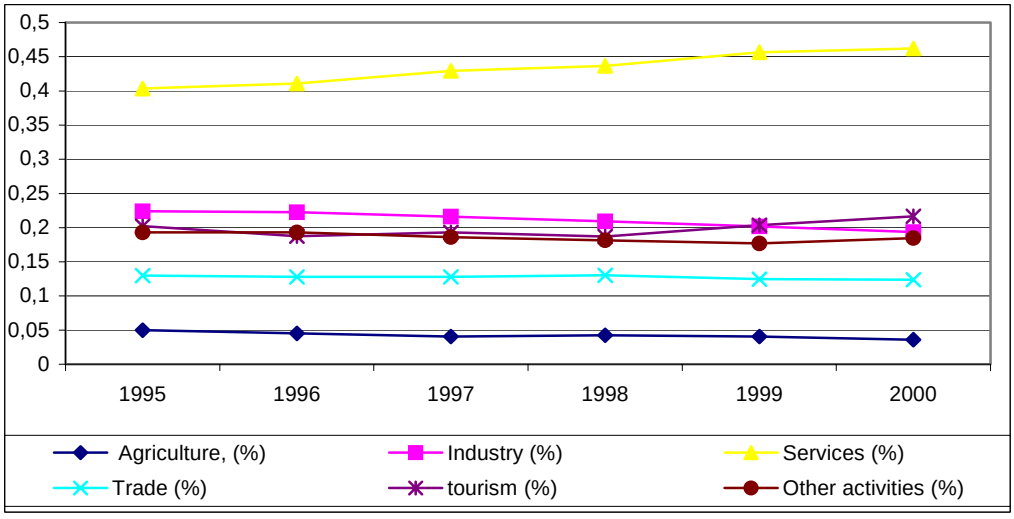
[10] The remaining land is uncultivated, arid, and forest.

[11] Government of Cyprus (1999).

[12] Even if not presented on the graphs a very important decrease is projected for 2002 reaching almost the zero level. This is due to the significant decrease of the demand in the tourist sector (because of the above-mentioned unstable situation from the Eastern Mediterranean area), which is the most important component of the services sector.

Graph A7: Evolution of the main sectors of the national economy of Cyprus[13]





Graph A8.: Real growth of the main sectors of the Cypriot economy (%)

Table A2 and Graph A9 on the next page depict the evolution of the structure of the economy from the same period in real terms (i.e. after eliminating the inflation, measured by the GDP deflator). This clearly shows again the importance of the service sector and the relative unimportance of the agriculture. The tertiary sector – made up of the services and the wholesale and retail trade together – gives about 56% of the total real income of the national economy.

[13] Exact values can be found in Annex Table A15.

Table A2: Structural evolution of the sectors of the Cypriot economy (from real values)

Year	Agriculture, (%)	Industry (%)	Services (%)	Trade (%)	Other activities (%)
1995	4.98%	22.39%	40.34%	12.98%	19.31%
1996	4.54%	22.24%	41.10%	12.81%	19.30%
1997	4.07%	21.61%	42.94%	12.77%	18.61%
1998	4.23%	20.92%	43.65%	13.04%	18.15%
1999	4.05%	20.15%	45.64%	12.46%	17.70%
2000	3.61%	19.33%	46.24%	12.36%	18.45%
Average	4.25%	21.11%	43.32%	12.74%	18.59%

Graph A9: Structural evolution of the sectors of the Cypriot economy (from real values)

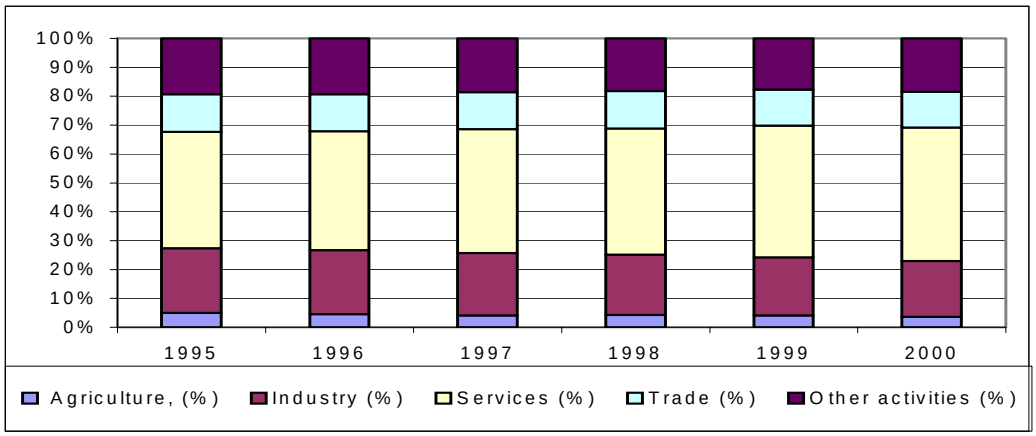


Table A3 shows the structure and the evolution of the tourism activities within the services sector in real terms.

Table A3: The importance of tourism (from real values)

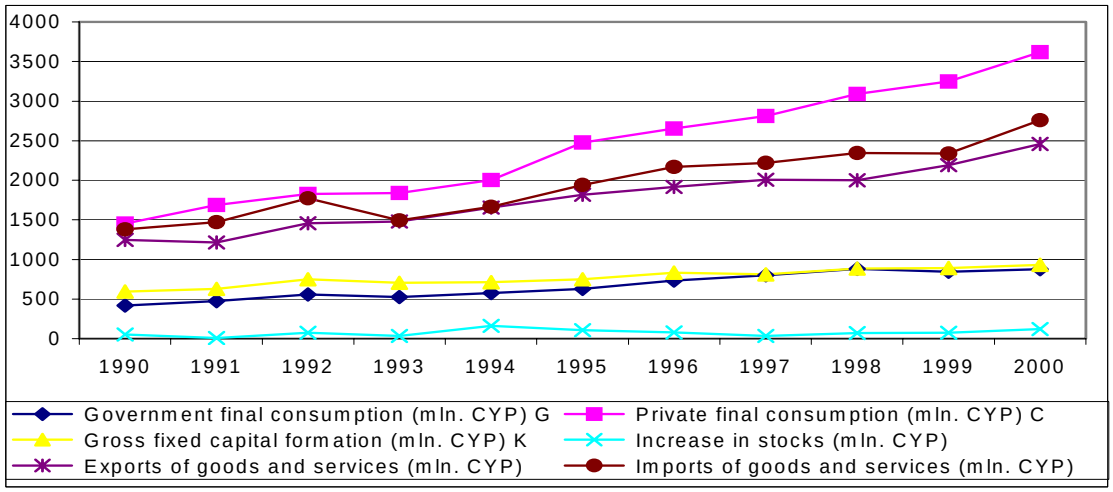
Year	Income from Tourism (% of services)	Income from Tourism (% of GDP)
1995	50.11	20.22
1996	45.62	18.75
1997	44.90	19.28
1998	42.81	18.69
1999	44.65	20.38
2000	46.85	21.66
Average	45.82	19.83

To sum up, the services sector is the most important component of the Cypriot economy, but also with the highest degree of vulnerability, because of its dependence on its main component, namely the tourism, which depends also heavily on the foreign demand for this type of service. The agriculture has the smallest importance with contracting activity sometimes within the total supply of the GDP. The reason behind are the size, the geographical type and geographical situation of Cyprus.

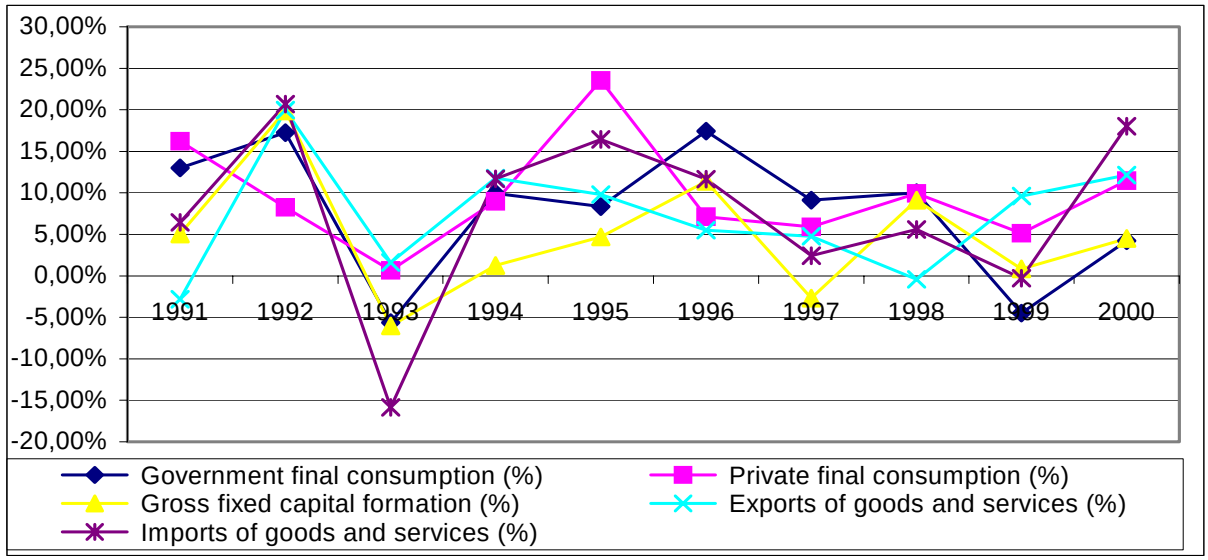
A.4. GDP by expenditure: demand side composition of gross domestic product

Graphs A10 and A11 below show the evolution of the demand side composition of the GDP in real terms and the percentage change of the same variables across the last decade.

Graph A10: Expenditure of real GDP (million. CYP)[14]



Graph A11: Changes in the Expenditure of Real GDP (%)[15]



[14] Exact values can be found in Annex Table A16.
[15] Exact values can be found in Annex Table A17.

The most important element to notice is the steady, positive growth of the private final consumption (Graph A10.). However, Graph A11 reveals that the 1995 value is an exception, with a 23.33% increase of this variable in that year.[16] Taking into account that the real GDP grew by more than 6% in that year, and being aware of the fact that all demand side "contributors" of the GDP growth were comfortably positive (at least about 5%) then this may simply be due to the remarkable acceleration of Cyprus's economy. After 1996 this variable increased less, indicating the fact that consumers try to smooth their consumption in time. Together with this the government spending was either low, or decreasing until 2000 when it started to grow again

Table A4: Structural change in the GDP expenditures

Year	Government final consumption (%)	Private final consumption (%)	Gross fixed capital formation (%)	Exports of goods and services (%)	Imports of goods and services (%)
1991	13.02	16.22	5.02	-2.80	6.44
1992	17.27	8.24	19.88	19.97	20.69
1993	-5.64	0.66	-6.05	1.59	-15.85
1994	9.91	8.99	1.25	11.80	11.70
1995	8.36	23.55	4.68	9.78	16.42
1996	17.41	7.12	11.37	5.51	11.65
1997	9.11	5.90	-2.69	4.80	2.43
1998	10.04	9.94	9.12	-0.44	5.61
1999	-4.50	5.13	0.85	9.63	-0.28
2000	4.25	11.46	4.52	12.16	18.00

A.5. GDP by expenditure: most recent developments[17]

Private consumption grew still by 5% in 2001 but at the beginning of the year it was sluggish. In the first 4 months private consumption was lower than the same period in 2000. Due to the increased international economic uncertainty, to the slower wage growth and to a further declining stock market, private consumption growth was expected to lose pace in 2002 to 3% but to grow somewhat in 2003. The lower growth rates are linked, to some negative wealth effects resulting from the substantial fall in share prices in 2000 and 2001. However, such wealth effects were not significant so far, but reduced the consumers' confidence. Higher wage growth is expected in 2003 and in 2004 partly as a result of the wage indexation mechanism.

The slowdown in investment in 2001 was accompanied by the already mentioned reduced confidence in the tourism sector and business services sectors. In spite of this, fixed investment growth still remained positive (1.4%). This was accompanied by a large reduction in stocks. In 2002, investment growth was expected to increase to 6%. Nevertheless, this rate is somewhat distorted by the purchase of airplanes in 2002, which also accounts for the low investment growth forecasted for 2003. However, the prospective EU entry, continued

[16] Due to the lack of the information the reasons for this huge growth cannot be evaluated.
[17] This part is written after consulting the November Enlargement Paper of the European Commission from 2002.

liberalization in the economy (mainly in the utilities sectors), government policies that promotes technological acceleration, prospective infrastructure projects and an increase in tourism, together with the expected EU growth will stimulate investment growth again up to an expected rate of 6% for 2004.

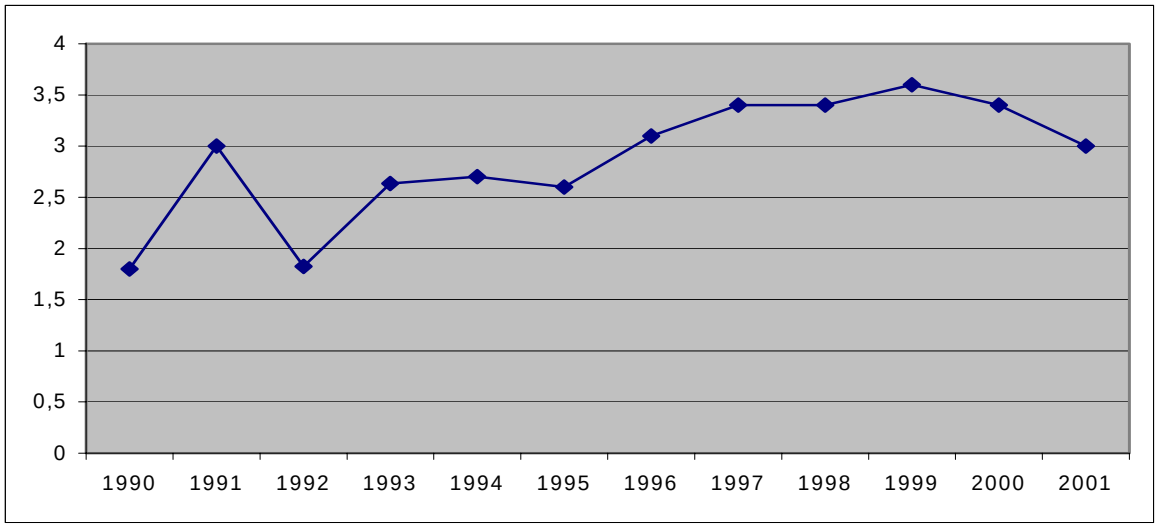
In 2001, total exports grew only by 3.9%, while in 2002 exports were expected to fall by 3.5% as the full impact of the drop in tourism arrival hits. In 2001 arrivals were stagnant, while in the first 3 quarters of 2002 arrivals fell by 14%, even if spending per tourist did not fall as much. At the same time tourism is expected to recover moderately (in line with previous experience following international crisis) and a modest pick up to 5-6% in export growth is forecasted for 2003 and 2004. At the same time, the slowdown in domestic demand and tourism significantly diminished real import demand growth, increasing only by 4% in 2001. In the first quarter of 2002, imports have decreased. With exports declining but increased investment demand real imports are expected to increase only very little for the year, then to grow somewhat in 2003 and more strongly in 2004.

The slowdown in import expansion in 2001, together with a slight improvement in the terms of trade, led to a small reduction in the current account and trade balance deficits for 2001 of 4.3% and 27.5% of GDP, respectively. However, the current account deficit for 2002 was set expected to grow again to 6% of GDP, which is clearly unsustainable. Due on the one hand to the expectations regarding the export, namely to continue to grow in 2003 and 2004 and on the other hand to the more pronounced fiscal consolidation, the deficit is foreseen to decrease to 3.6% of GDP by 2004.

A.6. Employment, unemployment and labour productivity

Cyprus had (and has) very few unemployment problems. It has a highly flexible labour market, mobile and skilled labour force and peaceful labour relations. Graph A12 presents the evolution of the Cypriot unemployment rate in the past decade.

Graph A12: Unemployment in Cyprus (%)[18]



[18] Exact values can be found in Annex Table A18.

As we can see from the graph above, at the beginning of the nineties the unemployment rate fluctuated somewhat more, but still it remained very low. Thus, we can state that the labour market operated close to full employment conditions. The ten years' average is at about 2.87%, which is the best among all accession countries. In 2000 average registered unemployment stood at about 3.6% and since then it is declining.

Seasonal workers coming from outside the island, effectively operating as a safety shell for seasonal low skilled labour demand largely divert wage pressures and labour market shortages. In the first semester of 2002 in nearly all sectors of the economy there was recorded a rise in unemployment. The expected figure for the whole year was about 4.3%. Together with the projected increase of growth in 2004 this value will go back to 3.9% (European Commission, 2002).

Foreign workers represent about 10% of the labour force. In spite of the high labour market participation ratio – around 70% - there is still room for raising participation rates among women mainly through part-time employment. Unions argued that the wage formation mechanism, characterized by the COLA-system (i.e. centralized bargaining and backward looking indexation system) had contributed to the stability of the labour market and to rational (not exaggerated) wage claims, which are in line with productivity. On the other hand, employers criticized the COLA system because they regarded as being an element of rigidity and amplifications of inflationary shocks. They also warned about the labour market shortages, arguing that they could hire foreign workers, alleviating these short-termed shortages. (IMF Staff Report, 2003).

Table A5 below presents the structure of the unemployment by level of education. The secondary general education is the "leader" group of unemployed. This is not surprising, because it is quite obvious that with a medium level general knowledge one cannot find a suitable job.

Table A5: Unemployed by level of education (%)

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001***
No schooling	1	0.9	0.9	0.8	0.7	0.6	0.4
Primary	27	26.6	27.2	27.4	29.5	28.1	24
Secondary General	44.6	45.1	44.8	43.6	43.2	45.8	46.5
Secondary Technical	6.3	6.8	7.3	8.3	8.1	8.9	9.3
Third	21.1	20.7	19.8	19.9	18.5	16.6	19.9

On the other hand, it seems that the secondary technical education group is the one with the lowest unemployment rate. This is again not surprising. What it is somewhat surprising, on the other hand, is the significantly low proportion of this group relative to the third one, which comprises the manpower with the highest level of education. Table A6 on the next page indicates the structure of the employed across the 1995–2001 period.[19]

[19] The primary data was obtained from the Cyprus Ministry of Finance.

Table A6: Employment structure of Cyprus economy

%	1995	1996	1997	1998	1999	2000	2001*
Economic Activity	100%	100%	100%	100%	100%	100%	100%
Agriculture, hunting and forestry	10.13%	9.63%	8.75%	8.60%	8.25%	7.89%	7.61%
Fishing	0.39%	0.39%	0.42%	0.45%	0.44%	0.46%	0.42%
Total 1	10.52%	10.02%	9.17%	9.05%	8.69%	8.36%	8.03%
Mining and quarrying	0.25%	0.25%	0.21%	0.21%	0.20%	0.20%	0.20%
Manufacturing	15.53%	14.78%	14.29%	13.74%	12.90%	12.17%	12.09%
Electricity, gas and water supply	0.49%	0.49%	0.49%	0.52%	0.51%	0.50%	0.49%
Construction	9.78%	9.56%	9.42%	9.05%	8.90%	8.79%	8.75%
Total 2	26.05%	25.08%	24.40%	23.52%	22.51%	21.66%	21.52%
Wholesale and retail trade; repairs	17.47%	17.79%	18.17%	18.18%	17.96%	17.98%	17.88%
Hotels and restaurants	10.62%	10.51%	10.40%	10.41%	10.76%	10.95%	10.79%
Transport, storage and communication	6.32%	6.44%	6.69%	6.83%	6.93%	7.10%	7.22%
Financial intermediation	4.34%	4.48%	4.62%	4.75%	5.20%	5.31%	5.10%
Total 3	21.28%	21.44%	21.71%	21.99%	22.89%	23.35%	23.11%
Real estate, renting and business activities	4.24%	4.38%	4.52%	4.79%	4.92%	4.94%	5.01%
Public administration and defence; Compulsory social security	6.42%	6.51%	6.69%	6.87%	7.03%	7.10%	7.22%
Education	4.69%	4.97%	5.22%	5.27%	5.33%	5.34%	5.53%
Health and social work	3.64%	3.75%	3.85%	3.88%	3.90%	3.98%	4.00%
Other community, social and personal services activities	4.27%	4.31%	4.34%	4.34%	4.48%	4.71%	4.71%
Total 4	19.03%	19.54%	20.10%	20.36%	20.75%	21.13%	21.46%
Total Services (Total 3 +Total 4)	40.31%	40.98%	41.81%	42.35%	43.63%	44.48%	44.57%
Private households with employed people	1.41%	1.75%	1.93%	2.12%	2.28%	2.59%	2.99%
Extra territory, organ and bodies	1.09%	1.09%	1.05%	1.01%	0.95%	0.93%	0.91%

* Projected Values

Agricultural, industrial and services activities are grouped according to the reasoning from Section 3. Adding up the figures corresponding to the real estate, renting and business activities, the trade, the private households, as well as the activity of the extra territory, organ and bodies to services we can infer that the employment rate is the highest in the tertiary sector, with a period average of 63.66%. This is followed by the secondary sector (20.59% period average) and finally by the primary sector, with only 7.59% of employed people out of the total of the gainfully employed people. This is in line with the amount of value added according to the supply side analysis of the national economy. These figures are only very slightly different nowadays.[20]

[20] The differences are only of the order 0.01 percentages.

Table A7: GDP structure by employment

Sector	Primary	Secondary	Tertiary
1995	10.52%	26.05%	63.43%
1996	10.02%	25.08%	64.90%
1997	9.17%	24.40%	66.43%
1998	9.05%	23.52%	67.44%
1999	8.69%	22.51%	68.79%
2000	8.36%	21.66%	69.99%
Average	9.30%	23.87%	66.83%

Table A8: GDP structure by sectors

Sector	Primary	Secondary	Tertiary
1995	4.98%	22.39%	72.63%
1996	4.54%	22.24%	73.21%
1997	4.07%	21.61%	74.32%
1998	4.23%	20.92%	74.85%
1999	4.05%	20.15%	75.80%
2000	3.61%	19.33%	77.05%
Average	4.25%	21.11%	74.64%

We can calculate a rough measure of each sector's labour productivity by dividing the output realized in the sector with the number of workers active in that respective sector (Table A9). Labour productivity is the highest in the tertiary sector and the lowest in the primary one. What it is really interesting for us is not particularly the values, but the evolution of the sector productivity. The average productivity growth between 1995 – 2000 was slightly higher in the secondary sector. This could be explained by the constantly high growth of the productivity in the mining and manufacturing sectors.

Table A9: Evolution of the sector productivity in Cyprus

Sector	Primary	Secondary	Tertiary	Yearly Percentage Change		
1995	6.49885718	11.7996671	15.71972	**Primary**	**Secondary**	**Tertiary**
1996	6.47713122	12.6765716	16.12576	-0.33%	7.43%	2.58%
1997	6.63193572	13.2336662	16.71694	2.39%	4.39%	3.67%
1998	7.44524028	14.1680895	17.67914	12.26%	7.06%	5.76%
1999	7.79645794	14.9748213	18.43342	4.72%	5.69%	4.27%
2000	7.59193676	15.6900764	19.35478	-2.62%	4.78%	5.00%
Average	7.11170396	13.7626955	17.38072	3.28%	5.87%	4.25%

Table A10: Yearly percentage change of the productivity within the sectors (%)

Year	1996	1997	1998	1999	2000
Agriculture	-1.40%	2.43%	13.72%	3.98%	-1.59%
Fishing	23.90%	-3.28%	-9.91%	16.24%	-15.65%
Mining	2.09%	14.21%	27.20%	8.82%	8.79%
Manufacturing	7.63%	6.24%	6.92%	8.52%	6.96%
Electricity	4.81%	2.43%	0.80%	-0.52%	17.73%
Construction	6.99%	1.36%	6.27%	2.72%	-2.15%
Trade	0.92%	2.02%	8.77%	1.56%	4.19%
Hotels	-1.23%	9.67%	8.23%	6.84%	7.14%
Transport	4.09%	2.31%	8.12%	7.97%	3.62%
Financial intermediation	4.74%	8.42%	5.92%	17.91%	6.76%
Real estate	4.81%	3.88%	1.28%	2.03%	4.26%
Public administration	7.10%	6.13%	4.16%	2.04%	3.31%
Education	3.01%	5.67%	6.12%	2.92%	4.67%
Health and social work	6.98%	4.78%	6.06%	4.68%	1.62%
Other services activities	9.25%	12.17%	9.79%	1.59%	1.08%
Private households with employed people	0.59%	-0.73%	0.02%	0.02%	-5.63%

Table A11, below presents the labour market participation rate, which depicts the proportion of the total number of people in the labour force to the total population of 15 years old and over. The five years average of the labour force participation is about 50.89%. This is more or less equal to the EU-average for the same period, but slightly less than the same figure for most of the other CEE accession countries. This is due to the premises of the Cypriot economy, which has never experienced the destruction of the communist ideologies.[21]

Table A11: Labour force structure by age and labour force participation

Year	1995	1996	1997	1998	1999	2000
Population distribution (%)						
0 - 14 years	24.60	24.30	23.80	23.40	22.80	22.30
15 - 64 years	64.30	64.60	65.00	65.50	66.00	66.40
65 years and over	11.00	11.10	11.10	11.10	11.20	11.30
Total Population (thousands)	730.00	740.00	740.00	750.00	750.00	760.00
Total pop. above 15 years (thousands)	549.69	560.18	563.14	574.50	579.00	590.52
15 - 64 years (thousands)	469.39	478.04	481.00	491.25	495.00	504.64
65 years and over (thousands)	80.30	82.14	82.14	83.25	84.00	85.88
Gainfully employed population (thousands)	283.30	285.50	285.60	288.30	294.50	301.50
L.F.P.	0.52	0.51	0.51	0.50	0.51	0.51

[21] In order to reach a faster convergence, the participation ratio in the formerly communist CEE countries should be above the more developed area average (e.g. the EU).

A.7. Inflation, external debt and fiscal policy[22]

Table A12 below presents the evolution of the inflation rate in the past decade, measured as the change in the consumer price index (CPI). The average growth of the CPI for this period was 3.66%. This again settles Cyprus to the top of the acceding countries' list. In 2001 inflation remained low, although planned VAT increases put upward pressure on prices. The CPI inflation in the examined period has generally been at, or slightly above, the EU level. In 2000, it climbed to 4.1% mainly as a result of higher energy and drought-related agricultural prices and a VAT increase from 8 to 10%. In spite of the wider fluctuation margins in 2001, inflation did not exceed 2% because the Cyprus pound remained firmly pegged to the Euro, monetary policy and fiscal policy remained constrained, energy prices level off and wage growth remains under productivity growth.

Table A12: Evolution of the CPI in %

Year	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Inflation	4.50	5.04	6.51	4.85	4.70	2.62	2.98	3.61	2.23	1.63	4.14	1.98	2.80

Inflation increased to 2.8% in 2002, mainly due to higher prices of food products in the beginning of the year, together with the effects of changes in VAT rates and excise duties. In 2003, the inflation rate is forecasted to peak around 4.3%, and decreasing again to about 2.2% for 2004. The main factors behind this are the further increase in VAT and excise rates in 2003 in the light of tax harmonization with the EU. However, the reduction of excise duties on cars as part of the same tax package and moderate domestic demand growth will mitigate the upward pressure on prices. Further domestic inflation risks may seem to come from fiscal consolidation going off track. (European Commission Enlargement Papers, 2003).

Financing current account deficits does not seem to become problematic. If the fiscal consolidation continues, domestic demand retains a modest growth path and there will be no further negative external price shocks. The current account deficit is expected to decrease to more sustainable levels. The liberalization process in the capital account and for the economy as a whole, (which were completed this year), in a situation of positive and stable growth, is expected to attract higher inward FDI and portfolio investment flows which will help financing the deficits.

While capital liberalization on the inflow side has progressed, on the outflow side this process has been lagging but further progress has been made in the course of 2001. Although earlier capital liberalization did not lead to significantly higher and more volatile portfolio flows, increased capital inflow pressures led the Central Bank of Cyprus to increase the exchange rate fluctuation margins in January 2001. Meanwhile it was trying to maintain the previous narrower bandwidth, and then to abandon the narrow bands in August 2001. The CBC widened the fluctuation margins around the central parity relative to the Euro from 2.25% to 15%. Although these measures could have been accompanied by higher volatility in interest and exchange rates, this has not materialized and the Cyprus pound remained stable. Meanwhile the reserves increased. On the medium run, the importance of debt-creating financing of the deficits will remain, and the risk of volatile capital flows is also present unfortunately.

[22] This section is based mainly on the European Commission Enlargement Papers.

The aggregate external debt of Cyprus is not that high but it has been increasing while the debtor composition changed. Short-term external debt accounts for about 15% of the total debt. Long-term foreign debt increased from 21.6% of GDP to 29.7% between 1996 and 1999, then it fell back to 27.6% in 2000 and increased again to 34.2% in 2001. External debt was basically made up mostly of government debt (in 2000 66% of total), while debt by the financial private sector was negligible (around 4%).

Nevertheless, the capital liberalization led to increased private sector borrowing from abroad in 2001, thereby rapidly increasing the share of the latter in total external debt to about 25% in 2001. If we include international banking institutions in the gross external debt data then this results in a much higher gross external debt ratio of 174% of GDP 2000. This value is misleading because such institutions hold large volumes of both foreign assets and liabilities but do not carry out transactions with residents and their transactions have only limited impact on the local economy. Reserve levels are at around 4.2 months of imports of goods and services. This includes coverage of imports destined for re-exports, which accounted for 17.5% of total imports of goods in 2000. This level is rather adequate and is expected to be maintained for the next few years.

The authorities in 1999 introduced a fiscal consolidation programme after an increase of the fiscal deficit to unsustainable levels of over 5% GDP in 1997-1998. The general government deficit fell sharply, particularly after July 2000 when VAT rates were increased a first time. While the primary surplus was 2.6% of GDP the general government consolidated deficit was brought down from 5.2% of GDP in 1997 to 3.0% in 2001. General government gross debt as a percentage of GDP increased slightly to 55.9%.

In addition to the fiscal consolidation plan, a major tax reform was approved by the Cypriot parliament in July 2002. It represents a considerable shift from direct to indirect taxation including, among others, further increases in excise and VAT rates to EU levels, higher social security contributions to improve sustainability of the pension system, a lowered uniform corporate tax rate of only 10% (for both local and offshore business), lower personal income taxes, and a gradual abolition of the defence levy.

The fiscal performance was significantly negatively influenced by the slowdown of economic growth in 2001 and 2002. In 2001 the government deficit fell to 3% of GDP, which was slightly above target. At the same time, the fiscal consolidation programme was slightly relaxed and intended to reach fiscal balance by 2005 instead of 2004, while a major tax reform was introduced to play an important part in the programme.

The direct involvement of state-owned enterprises (SOEs) in the economy is relatively small, being at 25% of GDP in 2000. We can infer from this that practically there is no risk of unexpected massive support to SOEs that would be in financial problems. Further privatization is planned in four of the five enterprises where the state has still a majority share. State ownership in the Cyprus Development Bank will be reduced from 88% to 45% only after the accession.

The further fiscal consolidation is crucial for containing Cyprus' current account deficit, for strengthening its capacity to deal with potentially more volatile capital inflows and for equilibrating the current policy mix. While public debt levels might not be a reason for immediate concern, prospective current account developments underline the importance of fiscal consolidation for reducing the economy's savings–investment gap. Fiscal consolidation

will also widen the space for the financing of private sector investment and development, and lessen the challenges for monetary policy in the face of ongoing capital liberalization.

Monetary policy is in a transitional phase. Recent strong capital inflows have exposed potential tensions in the overall macroeconomic policy framework. Monetary policy is geared towards price stability. On 1 January 2001, the authorities abolished the 9% interest rate ceiling. Banks are now free to apply the spreads on their lending according to their assessment of risk and credit rating of the client. At the same time, the Central Bank abolished all restrictions on medium-term and long-term borrowings of the residents with maturities over two years.

As a consequence, after the further liberalization, resident foreign currency borrowings[23] increased sharply in 2001, leading to increased liquidity growth. The CBC decided in August 2001 on a pre-emptive move to reduce interest rates. This was because the Bank wanted to prevent lower growth prospects after the summer, given low inflation. Altogether, interest rates were lowered three times in the course of 2001 to reach as low a level as 5.5% by the end of the year. As a result of the concomitant reduction of the differential between domestic and foreign interest rates, private sector foreign borrowing fell sharply in 2002.

In order to meet the challenges of a greater capital mobility, the central bank has made the exchange rate regime more flexible. On the 1 January 2001 it committed itself to keep the exchange rate within a +/-2.25% band if the economy is on a "natural" path, following the abolition of capital restrictions and the interest rate ceiling. It announced at the same time that fluctuations of +/-15% would be allowed in the event of unusual pressures in the exchange rate market. The central bank's resolution of defending the parity was tested in June 2001, when capital inflows were particularly strong, and it was forced to sterilize these flows.

Subsequently, in the face of higher inflows and anticipated higher volatility as capital liberalization proceeds, the central bank abolished the narrower margins in August of that year. This was occurred together with a decision to lower interest rates to prevent an anticipated negative impact of a global economic slowdown on the Cypriot economy. This further reduced the differences between Euro denominated and domestic loans, diminishing the pressure of borrowing abroad, and net inflows of capital since then have been relatively small. With the broadening of the bands, the exchange rate is now effectively floating. In spite of these, there has not been any significantly higher exchange rate volatility and the Cyprus pound (CYP) essentially remained stable relative to the Euro. If capital flows continue to follow recent trends also after full liberalization, it can reasonably be expected that over the coming years exchange rate pressures and fluctuations will increase. However, these will remain relatively limited because the economic fundamentals are pretty much sound.

The financial sector contributes at about 20% of GDP and 9% of employment. The banking sector has not experienced any crises or payments system disruption, and bank restructuring has not been associated with bank failures. The sector is relatively concentrated, with the three largest banks accounting for nearly 80% of deposits. With the liberalization of the interest rates, competition has increased and banks widened their product scale.

The domestic financial sector is large relatively to the size of the economy, and banking, which dominates the financial sector, is well developed. In addition to the Central Bank, the

[23] which are made mostly in Euro

domestic banking sector consists of 12 domestic banks, 4 of them foreign owned the banking system,[24] 28 international banking units, 2 administered banking units,[25] 3 specialized financial institutions and a number of leasing companies. Commercial banking arrangements and practices follow the British model. Strong correspondent networks are maintained around the world by local and international banks. Most of them subscribe to SWIFT, Reuters, Telerate and other services. Thus they have easy access to the world-banking network and are able to carry out traditional and specialized financial transactions.[26]

The banking sector provides effective intermediation between savers and investors. At the end of 2001, its assets amounted to around 280% of GDP, which means a 6% yearly increase. The private credit-to-GDP ratio was at 125% of GDP (end of 2001. The growth of the nominal credit towards the private sector was about 11.45% on average in the period 1996–2000, and reached 15.2% in 2001. The ratio of private sector deposits/GDP amounts to approximately 196% at the end of 2001. Banks are already allowed to provide credits denominated in foreign currency following gradual liberalization. Thus, lending more than doubled, from 4.6% of total lending in 1996 to 10.4% in 2001. This can be considered part of an adjustment process after capital liberalization, but poses an increased exposure risk to banks and clients. Nearly 60% went to the tourist sector and foreign trade. There is no explicit exchange rate risk and banks are required to inform clients about this issue. (European Commission Enlargement Papers, 2003).

The offshore financial sector is not as large as other offshore centres[27]. The development of the offshore sector in Cyprus has been facilitated by its location, preferential tax regime[28], extensive network of double tax treaties, a legal and accounting framework based on UK law and practice, and high quality infrastructure. Its contribution to employment and foreign exchange earnings is much smaller than tourism, and the contribution to government revenues is minor. The services provided are more restricted than in other offshore centres, being made up by several banks, insurance services, and small-scale fund management and advisory business. Banking is the most important offshore activity. Its assets are at about11.7 billion Euro. It is followed by commerce.

The Stock Exchange started to operate in 1996. The Council makes the implementation of its policy. Transactions are electronically displayed and the present clearing and settlement processes have been computerized. Its capitalization was as much as 152% of GDP at end 2000. After tax incentives for newly listed companies and a large number of initial public listings, the Cyprus Stock Exchange (CSE) index jumped up to over 700 by the end of –1999 (In 1996 it was at about 100). This rise clearly did not reflect fundamentals in the market. After this, in 2000, the trend changed in and the index continued to decline until the 129 level by December 2001. The market capitalization had fallen to 68% of the GDP. This decrease has not so far affected the real economy, perhaps due to the very rapid increase and decrease with positive net gains. Nevertheless, these swings affected negatively the confidence of the investors.

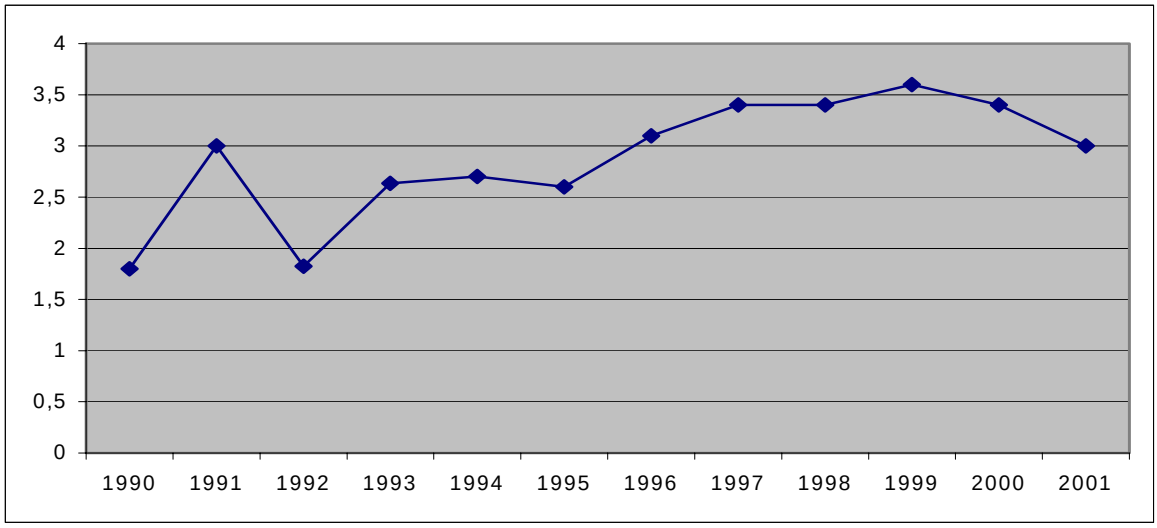
[24] These accounted for 13% of banking assets in 2001.
[25] These are small government controlled specialized credit institutions, which account for 4.3% of total banking assets
[26] Information obtained from the web site of the Central Bank of Cyprus, http:// www.centralbank.gov.cy
[27] According to the IMF definition “offshore” is “a business owned by non-residents providing services primarily to non-residents. It does not include international business of Cypriot owned activities, e.g. banking services provided by domestic banks to foreign customers.” (IMF)
[28] This is going to be abandoned by 2005.

The insurance industry is also pretty well developed with all types of risk accepted, mainly through agents and brokers. About 70 insurance companies and insurance captives operate on the island currently, many of which are incorporated abroad and represent well known multinational insurers. However, only 11 of the 19 foreign companies are active. The authorities regulate local banks and insurance companies in such a way as to safeguard the interests of depositors and assured, and to channel investments into productive activities. Even if the domestic insurance market remains relatively small[29], it expanded rapidly in 1999 as life insurance companies aggressively sold single premium policies during the stock exchange boom.

Regarding the external sector, we already examined the evolution of this until 2001. However, in order to obtain a snapshot we still need to tell something about the present situation of this. This sector was strongly hit by international developments in 2002, in spite of the rather high flexibility to the economic slowdown in 2001. During the year, total export growth is estimated to have dropped by nearly 5%. This is mainly due to a sharp decrease in tourist arrivals of approximately 10%. With tourism expected to show a weak performance, export growth is projected to remain marginally negative in 2003, but is expected to recover forcibly in 2004, in line with past experience of earlier crises when a recovery of external demand was expected to become more visible. Similarly, import growth dropped in 2002. This is due partly to lower exports, because of the high import content of exports, but the slowdown in domestic demand and tourism also diminished real import growth. Import growth is expected to remain torpid in 2003, but is forecasted to accelerate strongly in 2004 in line with the resumption in export and domestic demand expansion.

As a result of these developments, the current account deficit worsened again in 2002, to 5.3% of GDP. For 2002 and2003, it is expected to improve progressively, although slowly, because the recovery in external demand is delayed. Although financing has not been problematic so far, the relatively high deficits remain a potential cause for concern.

Graph A13: FDI flows into the Cypriot economy[30]



[29] Its gross premiums amounted to 6% of GDP in 2000, which represents a decrease relatively to 1999, when they were at about 8.7%.
[30] Exact values can be found in Annex Table A19.

Graph A13 on the previous page presents the foreign direct investments flows. Until 1998 the trend was clearly downward sloping. This may have various reasons. It might be explained by the possible saturation of the economy, because as we know, the country has very little human potential. On the other hand, the political tensions from the island may have influenced negatively the flows of direct investment. The reversing of the trend may be due to the start of the negotiations with the EU, which clearly meant a "normalization" of the political regime, bigger safety for the foreign capital as well as to the more extensive liberalization. The sudden spectacular pick up may be caused by the excellent quality of the Cypriot manpower, which again could be better valorised in the conditions of a sure future.

As a result of the negotiations, there are no exchange control restrictions applicable to direct and portfolio investments by natural or legal persons from EU member states. However, in the banking sector the foreign participation is restricted to 50% of the equity capital. There are also some restrictions regarding the acquisition of property, the establishment of radio and television stations and the provision of utilities. On the other hand, non-EU investors may invest in companies quoted on the CSE if the equity participation does not exceed 49%. However, for investments in other companies there are certain restrictions concerning the maximum percentage or the minimum amount of participation, depending on the sector of the investment.

A.8. SWOT analysis on the Cypriot macroeconomic conditions[31]

Strengths

Cyprus is a free enterprise, open, developing economy. The strong private sector holds a predominant role in the production and investment process, while the public sector is involved in the production of goods and services in areas where the private sector is less interested. Cyprus is a developing economy with a per capita income of $13.500 and an average rate of growth of 4%. This is about 80% of the EU-average, which clearly places the country to one of the first places among the next year's acceding countries.

The manpower of the country is of very good quality. This is shown by the extremely good and rising productivity of the gainfully employed labour force. Another positive characteristic of the country is that it always had a low unemployment level, the economic conditions were always close to full employment. On the other hand the inflation rate is one of the lowest from among the acceding countries. Altogether, this shows the soundness of the Cypriot economy. The level of the infrastructural facilities including telecommunications and transportation are rather satisfactory.

Weaknesses

The heavy reliance on the broad sector of services and more specifically on the single sector of tourism, which is about 20% in terms of the value of receipts to GDP, is a weakness of concern.

Cyprus economy has been functioning until recently under protection from imports through tariffs, quotas and other administrative measures. The gradual abolition of this protection and the opening-up of the economy showed the need for enhancement of its competitiveness. In the manufacturing sector there is a need for technological upgrading, the tourist product

[31] This part uses mainly the comments of Mr. Antonis Malaos, EIC Director

should be diversified, in the agriculture, production should be oriented to the preferences of foreign consumers with a flexible production pattern.

The economy is characterized by certain rigidities. In the labour market there is a need for revisions and reforms to make it more flexible and to adjust according to the changing conditions in the economy. Further liberalization policies should be adopted also in the case of other services such as telecommunications and air transport.

As a small, open economy, Cyprus is extremely dependent on the international economic climate, and especially on the tourism sector. The evolution of the current account and balance of payment deficit measure the levels of the stability. There is a need to contain the deficit, the more so since the major volume of imports refers to consumer goods. The policy objectives in this field should focus on the restructuring of imports towards an increase of the imports of the capital goods and the increase and diversification of foreign receipts.

The fiscal accounts are running on an increasing deficit during the last 4 years. This is attributed to a number of factors. The first factor could be the decrease in public revenues as a result of the abolition of tariffs for imports from EU member countries and the adoption of the Common External Tariff for imports from third countries. Another factor is the increase in the current public expenditure on personal proceeds and interest on public debt. Another weakness is represented by the agriculture (see the previous parts).

Threats

Cyprus is an open economy with a very high level of exports and imports in relation to GDP. The lack of indigenous resources makes the manufacturing industries dependent to a large extent on imports of raw materials, while the small size of the market increases the reliance on foreign markets for the export of goods and services.

Another threat is the existence of sensitive sectors (finance, agriculture, tourism) for special treatment during negotiations. Among those sectors we could refer to that of international business entities. The offshore activities enter into this category. Cypriot population does not benefit usually from the proceeds of these activities, as they are pursued mainly by foreign firms who do not intend to reinvest the profits into the Cypriot economy.

Opportunities

Perhaps the biggest opportunity of Cyprus compared to most of other candidate countries is connected to the political background rather than to the economical. The relative sound macroeconomic situation and with a solid institutional background based on the laws of the market the circumstances for Cyprus gave an absolute economic advantage in comparison with all CEE countries. But not to be forgotten, the Greek–Turkish conflict, which resulted in a sharp social, political – and as a consequence, also economic – diversification, has a great drawback relative to the other acceding countries. Together with the EU accession it will finally have a great chance to solve this problem. Once the political problem is solved, the poor northern area will have greater investment opportunities also and the welfare discrepancies between the two regions will diminish step by step.

Another important opportunity for the island would be the further development of the human capital and the consequent exploitation of the proceeds. The pool of the available savings and funding resources will increase and further and more significant amounts of money will be

available for educational purposes. The increase of high quality labour will probably be one of the major supply side growth factors in the near future.

Strengths	**Threats**
Strong private sector High per capita income Manpower of good quality Satisfactory level of infrastructure	Manufacturing industries heavily depends on imports of raw materials Too much reliance on foreign markets Sensitive sectors
Weaknesses	**Opportunities**
Structural weaknesses Need for increased competitiveness Institutional weaknesses Problems of stability Fiscal problems Weak agriculture	Settlement of the Greek - Turkish conflict and clarification of the political situation Further development of the human capital.

B. NATIONAL AND REGIONAL INFORMATION SOCIETY POLICIES

B.1. Description of national and regional institutional settings and their influence on IS policies

B.1.1. General comments

Among the 13 accession countries, Cyprus[32] together with Malta is quite different than the rest due to their size, location, and history. When discussing IS policies, it will be good to remember the following special characteristics of Cyprus:

1. Its small size. Cyprus is divided into five regions. However, this is only an administrative division and is not used extensively. What is considered regional policy is carried out by local municipalities. The 33 municipalities represent about 65% of the total population.[33] As it is true for most accession countries, power is concentrated to the capital, and local communities play a minimal role in decision-making. They are actors only in implementation of decisions.
2. It is an island economy, which poses a special problem for transportation and telecommunications. Thus, it was forced to invest to high-tech equipment to connect it with the rest of the world, especially since the bulk of its GDP (73%)[34] comes from services. By now, Cyprus is equipped with state-of-the-art telecommunications that many countries would envy.
3. It is already considered a developed country. Fortunate enough not to have to go through communism like the majority of the accession countries, it has steadily developed in the last few decades. Its GDP after an adjustment for PPP is estimated to 80 of the EU average, in par or even better than that of Greece and Portugal. Moreover, its telecommunications equipment is on par in terms of quality and coverage with the Western European countries since it has invested heavily in it.
4. The biggest problem of Cyprus is the division between the Greek and Turkish parts. It has been a historical aim of all Greek Cypriot government to end the division and reunite the two sides. Accordingly, since it is the internationally recognized part, it participates and seeks to participate in all international forums, voicing its willingness for a just solution to the problem. Accession to the EU has been considered as a means to achieve fiscal and monetary stability and simultaneously force a solution to the political problem under the auspices of the EU. Having this in mind, beginning from 1984[35] Cyprus has complied with the majority of EU directives, including directives regarding IS policies, which have driven the developments in the sector.

[32] Unless otherwise specified, Cyprus will refer to the Greek Cypriot side.
[33] Union of Cypriot municipalities: www.ucm.org.cy/eng/about.htm
[34] CIA website: www.cia.gov/cia/publications/factbook/print/cy.html
[35] All EU directives adopted by Cyprus since 1984 are included in the following MCW website: www.mcw.gov.cy/mcw/mcw.nsf/DirectivesLookup?ReadForms&languageNo=2

B.1.2. General observations regarding the telecom sector

Specifically related to the technology sector, we should note the followings:

1. The telecommunications sector of Cyprus has been under monopolistic control of the Cyprus Telecommunications Authority (CYTA) since the enactment of the Law on Telecommunications in 1954.[36] This legal framework gave monopolistic power to CYTA until very recently. Therefore, developments in the sector, except in the case that they refer to CYTA specifically, have been very slow and are usually related to EU directives.
2. Due to the monopolistic environment of the telecom sector, the relations of politicians to CYTA are very close. The high-level management of CYTA has developed strong ties with numerous politicians. It is not an accident that while Cyprus has adopted every EU directive on its own choice, the modus operandi of the telecom sector was the last one to be modified, and is pending further amendments, to fulfil EU standards. Clearly, one of the most important reasons for this phenomenon is the unwillingness of politicians to disrupt the interests of a very important lobby. This has created discontent among other players who are eager to enter the market or competitions for projects. In general, transparency is limited in the transactions of the sector. For example, unlike most other accession countries, Cyprus has only one mobile phone operator, which is a subsidiary of CYTA. A competition for a second license was announced in 2002 under strong pressure from the EU and the IMF.
3. A key sign of an advanced telecommunications and information technology environment is one in which the telecommunications industry is liberalized in both infrastructure and service but well regulated by the governing authorities. In Cyprus there are many private suppliers of telecom hardware/software as well as satellite, Internet and mobile phone services. The physical land lines within the island are however owned by the CYTA, a corporate body established by law to provide telecommunication services nationally and internationally. They have made substantial investments in the past few year, towards upgrading its telecommunications network and providing a number of new advanced services to meet the ever increasing market demand.
4. As noted above, regional policy is largely formulated in the capital and only implemented in the regions. However, local municipalities are active in IS, especially in the cases of tourism promotion, and have developed information portals to some extent.[37]
5. Until today, the Cypriot government has not formulated a strategy specifically aimed at advancing IS. Instead, IS policies are usually part of other strategic designs like the 5-year development plans, often considered as a means to an end rather than a goal in themselves. For example, Cyprus aims at becoming an international and regional centre for services and information. IST is deemed important as far as it is valuable in furthering this goal and is developed in conduction with advancements in other areas.

[36] This Law is largely outdated and does not fulfill EU requirements concerning harmonization (Cullen International SA and Wissenschaftliches Institut für Kommunikationsdienste Gmbh report for the European Commision). More information will be given in the section regarding regulation.

[37] Some of the most advanced ones are: www.nicosia.org.cy, www.limassolmunicipal.com.cy, www.larnaca.com, www.strovolos.org.cy.

B.1.3. Most important institutions

Ministries
Ministry of Communications and Works (MCW)
(Υπουργειο Συγκοινωνιων και Εργων)[38]

The Ministry of Communications and Works is the governmental body directly supervising the telecom and IS sectors. Its activities are wide-ranging and include the following departments: antiquities, civil aviation, electronic communications, electrical and mechanical services, merchant shipping, postal services, public works, and road transport. The Department of Electronic Communications assists the government in 'telecommunication policy matters' and technical issues. It directly supervises the activities of CYTA, represents the government in all related international organizations such as ITU (International Telecommunications Union), ECTRA (European Committee for Telecommunications Regulatory Affairs), and EUTELSAT (European Telecommunications Satellite Organization), and manages the activities of the Cyprus Coordination Telecommunications Committee.

The most interesting task of MCW is the control of CYTA. Furthermore, MCW is supporting the use of IS within its authorities. For example, Cyprus Ports Authority has set up an online shipping system with access to such information as shipping agents, ships, cargoes, etc.

Ministry of Commerce, Industry, and Tourism (MCIT)
(Υπουργειο Εμποριου, Βιομηχανιας και Τουρισμου)[39]

It is responsible for the liberalized part of the telecom market, for example subscriber TV, data transmission, Internet services providers, value added services and equipment provision. Moreover, it supervised the work of the Office of Competition until it became independent in 2000. It regularly organizes conference like 'Cybit 2001' to promote eCommerce and the use of advanced technology by businesses and entrepreneurs.

Other Ministries

In addition to these two Ministries, there are a few other Ministries or governmental offices that are active in IS, which reflects the rapid expansion of eGovernment on the island. The general governmental web-site www.cyprus.gov.cy was established in 2002 and virtually all governmental institutes can be accessed through it. A small number of problems are expected to disappear soon. The Ministry of Finance created a department specifically for the advancement of IT and IS since 1987 and recently introduced a completely automated IT system for the General Bursar's office. In addition, the Ministry of Education and Culture is quite active in IS. It introduced a class in conjunction with CISCO Systems in high-schools in 2002, organizes conferences like 'Information Technology and Education' in 2002, and has developed a programme since 2001 for making all educators of elementary and secondary education, around 10 000 teachers, 'computer literate.'[40]

[38] www.mcw.gov.cy
[39] As a whole, this Ministry does not have a web-site. However, different offices under the Ministry's jurisdiction are represented on the Internet. For example, the department of commerce: www.cyprustrade.gov.cy, the department of co-operative development: www.pio.gov.cy/coop and the registrar of companies and official receiver: www.pio.gov.cy/drc
[40] Information from www.cyprus.gov.cy

State Companies

Cyprus Telecommunications Authority (CYTA)
(Αρχη Τηλεπικοινωνιων Κυπρου)[41]

The Cyprus Telecommunications Authority was by law the exclusive supplier of facilities and services in the telecom area until the introduction of a new law in 2002. Using this advantage, it has created a network of connections and relationships within the political sphere of Cyprus. For many years, it has benefited from its monopolistic power to achieve high profit margins. Only recently, after increased pressure by the EU and other international bodies, it has begun to reduce the prices for its services. However, this is done selectively, prices for domestic calls are increasing while mobile and international services' costs are decreasing.

CYTA has been for many years the lone provider of telecom services and equipment in Cyprus. In addition, it has been one of the few sources of information concerning the evolution of telecommunication, a source of statistics, and a resource in terms of current technical and service developments domestically and internationally. It has organized conference to increase the awareness of businesses and individuals regarding the use of Internet, mobile phones, and ISDN connections. For example, recently it hosted a seminar regarding eBanking. However, the reader has to keep in mind that these activities while at one hand promote IS at the other are a marketing tool advertising CYTA, especially due to the impeding liberalization. Much more will be said about CYTA later as it is the main player in the telecommunications market and the target of the legal reforms.

Cyprus Electrical Authority (EAC)
(Αρχη Ηλεκτρισμου Κυπρου)[42]

While not directly related to the telecom industry, the EAC maintains the only alternative telecommunications network on the island. Developed for internal use only, it is expected that it will enter the telecom market after its liberalization and CYTA's loss of monopoly power. It has to be noted that the President of the organization emphasized in September 2000[43] that a change was imminent in the legal framework of its operation to enable EAC to enter the telecom market. Due to the delay of implementing telecom's liberalization, EAC has not work in this direction yet. However, its advanced fibre-optic network is expected to be beneficial for many customers, especially coming from the business sector where questions regarding speed, reliability, and quality are crucial. In addition, the network has been developed for many years, making additional investment only incrementally necessary. Moreover, one the goals of EAC's development plan is the introduction of advanced IT systems that will assist it in achieving its objectives.[44]

[41] www.cyta.com.cy
[42] www.eac.com.cy
[43] www.eu-esis.org
[44] www.eac.com.cy/EAC_Homepage.nsf/EnglishMainFrameset?OpenFrameSet

Semi-governmental offices:

Planning Bureau (PB)
(Γραφειο Προγραμματισμου)[45]

The Planning Bureau was established in 1961. It fulfils two roles, one in assisting in the formulation of a long-term strategy in the area of economics and second in controlling and implementing the development policy as set by the government. Concerning IS policies, it has a crucial role in the allocation of financial resources and projects in the 5-year development plans that were initiated since 1998. The first one commenced in 1998 and its goal was to create the necessary conditions for Cyprus to become an international business and services centre. The second of these plans began this year. Both of them include clauses that relate to IS and to strategies that foster its development in the island. We will discuss them later, in the subsection regarding IS policies.

Moreover, the PB is directly connected with the expansion of eCommerce on the island. As it was mentioned in the 35th ICA Conference in Berlin,[46] a ministerial committee assigned the PB this responsibility. The PB has already taken some steps in this direction like assessing the current legal framework and developing alternative plans for future modifications, the formulation of a strategy regarding eCommerce, and following the developments in the EU insofar they affect Cyprus and eCommerce.

Office of the Commissioner of Telecommunications and Postal Regulation (OCTPR)
(Γραφειο Επιτροπου Ρυθμισεως Τηλεπικοινωνιων και Ταχυδρομειων)[47]

One of the most important recent developments is the creation of the Office of the Commissioner of Telecommunications and Postal Regulation in 2002 with the parliamentary approval of Law 19(1) 2002 "regarding the organization of the telecommunication and postal services." Strong pressure by the EU resulted in a new office regulating the telecom sector. The goal of the Commissioner is to promote the interests of the sector's consumers in terms of price, quality and breadth of services. Specifically, it strives to create a competitive environment by providing choices to consumers in terms of consumption sources, maintain high quality of services, reduce prices, ensure consumer safety, and promote innovation. Essentially, it is a measure leading to the liberalization of the market. Its great effect in changes in the sector will be shown and discussed a little later.

Competition and Consumer Protection Service (CCPS)
(Επιτροπη Προστασιας Ανταγωνισμου)[48]

The Competition and Consumer Protection Service was established in 1990 after the introduction of "Competition Protection Law" 207 (89.) Its goal is to maintain an environment of competition in all industries by locating and penalizing anti-competitive policies of companies and organization. In this manner, it hopes to achieve lower priced, increased efficiency, strengthened innovation, and higher national competitiveness.[49] In 2000, it was granted independent status according to the EU harmonization standards. Concerning

[45] www.planning.gov.cy
46 www.ica-it.org/conf34/roundtable/cyprus.pdf
[47] www.octpr.org.cy
[48] www.competition.gov.cy
[49] www.competition.gov.cy/competition/competition.nsf/aboutcpc_en/aboutcpc_en?OpenDocument

IS, it investigated whether CYTA had used its monopolistic power to achieve higher profit margins by employing a skewed pricing policy. In August 2002, it decided to fine CYTA 20 million Cypriot pounds for anti-competitive policies.

B.2. Chronological description of national and regional IS policies

Background on telecom policies

Similar to many matters of national interest, the interest towards IT developments varied from time to time. At various points in time The Republic of Cyprus has placed great efforts in defining national objectives, setting forth a contingency plan and checking upon the status of the items contained within the plan. However the time intervals in between each course of action have been quite extended and therefore the progression of IT within the Republic of Cyprus has been very slow.

Up until the early nineties, the level of RTD activities in Cyprus was low, not only by international comparison, but also given the relatively high level of development of the economy of Cyprus. Most of the research activities were undertaken by the public sector. Since financing of these activities was provided directly through the annual Development Budget of the Republic, there was little incentive for competition to secure the required funding.

During the last few years, however, RTD activities in Cyprus have been significantly expanding, mainly as a result of the establishment of the University of Cyprus and the increase of research activities undertaken by a number of research organisations, in the public as well as in the private sector. The establishment of the Research Promotion Foundation - an institute responsible for the co-ordination and support of research activities - has also been an important step towards the promotion of RTD in Cyprus. Moreover, the participation of Cyprus in the Fifth Framework Programme for Research, Technological Development and Demonstration Activities of the European Union, is considered of utmost importance, as it pays a catalytic role to the expansion of research activities and enables Cypriot scientists to create networks of co-operation and interact with their European colleagues.

It has now become the aim of the Republic of Cyprus to try and connect the IT activities with the specific needs of the immediate economy. In order to try and support this decision it has been noted that the promotion of IT should start in the education system, which is quite extensive over the entire island of Cyprus. Despite current pushes within the education system and various other items concerning IT, the government of the Republic of Cyprus recognizes that its efforts are still lacking.

National Policies

Cyprus is a ‘late-starter’ in terms of IS policy. While the understanding that something had to be done in this area was always there, the Cypriot government was quite slow in implementing programmes focused on IS. The majority of them began after 1996, when the accession to EU was a visible goal and harmonization was required. Moreover, the increase of programmes related to IS coincided with Cyprus’ participation in the 5th Framework Programme. Therefore, many projects and ventures were co-sponsored with the EU, which made funding easier to attain and raised the interests of businesses, organizations, and individuals.

The Kyprianou Administration (1983-88)

The Kyprianou government should be credited to be the first to recognize for a concrete and comprehensive policy regarding IS. However, the original discussion was too general, giving broad guidelines and goals to be reached. One could say that it consisted more of the acknowledgement and analysis of the situation and less of an examination of the concrete steps that needed to be taken.

The Vasiliou Administration (1988-93)

In 1987 it inaugurated the 'Information Systems Strategy,' (ISS) which in one form or another still exists. In this state, it consisted more in the form of a computerization plan, with the aim of introducing computers in all governmental offices and departments and limiting the paperwork in the bureaucracy. Not much is known about specific projects. Nevertheless, the government did largely succeed in implementing this policy as it is shown by the fact that infrastructure was considered developed in subsequent plans. Furthermore, it introduced the institution of the Competition and Consumer Protection Service as a means of encouraging competition and limiting monopolistic practices.

The Clerides Administration (1993-2003)

Until 1998, it followed the plan of the previous government in terms of office computerization. However, in 1999, the government of Cyprus adopted a new, and we dare to say, revolutionary industrial policy for the years 1999-2003. Although not aimed specifically at IS, it was through this plan that the importance of IS became visible to the public. This policy was the foundation of the development of IS on the island since then. The main goals of the plan were:[50]

- Harmonization with the EU
- Growth – Stability – Social Cohesion
- Restructuring – Modernization – Enhancing Competitiveness
- Cyprus as International and Regional Services Centre
- Improvement of Quality of Life
- Adaptation to IS
- Reform of the Public Sector

Most of these goals can be facilitated with the advance of IS. Indeed, IS is the link between them and is included as a prerequisite for success in all of them. IS development is deemed so important that it received special attention in this plan. Under part F, the followings are included:

- Promoting the awareness of the population
- Reforming the education and training systems-adapting them to IS
- Promoting the concept of life-long learning
- Improving the infrastructure in telecommunications
- Utilizing IT systems for the modernization of production-encourage domestic firms engaged in this activity to expand abroad

[50] www.pio.gov.cy/cyprus/economy/econdev.htm

Examining the activities of the government, one is able to see the importance of IS in each area. The legal framework governing telecommunications and media was harmonized according to EU standards and the law concerning the Internet is currently prepared. In the public sector, a good example is the Courts Administration System that was introduced with the aim to computerize Courts Administration. All courts (Supreme, Criminal, District, Military, etc.) are automated and interconnected. In addition, they are connected to other relevant offices (police, Law office.) The Ministry of Education has been quite active in encouraging IS education as we have noted.

Regarding IS and industrial policy, the following were the most important projects:

- Development of Business Incubators
- Expansion of Research and Development
- Foreign Investors Service Centre
- Subsidization of studies and development of specialized software

All these undertakings require a high level of IS development and utilization of the most modern IS tools. Part of the services the business incubator is planned to offer are telecommunication, a computer network, Internet connection, access to databases, access to a transfer of technology network and information about patents. The goal of the subsidization plan is to increase exports by using special software. This software is to be developed by new or existing companies that operate in the area of production automation.

In the area of IS, in 2002 the government decided to continue its policy in two directions. First, continuing the ISS, since most of the infrastructure is in place it decided to move on to the project of web-enabling. Thus, it is in the process of completing an Internet/Intranet/Extranet System for all governmental departments. The Governmental Data Network (GDN) was developed as a means to access databases between departments and to allow their communication. The governmental web-site, a very useful portal to all information about the island, was inaugurated in September 2002. In addition, the government pursued the approval of the 'Ex-Libris' project by the EU, whose goals move along the lines of interconnectivity.

Second, the Ministerial Committee was designed and established by the government as a working group that would assess the IS situation in Cyprus and make policy recommendation in order to promote it. Addressing the obvious lack of development in eCommerce, the Ministerial Committee assigned the Planning Bureau, after a consultation with them, to be responsible for the area of eCommerce on the island. The PB has already hired consultants who will prepare a study. It should include proposals regarding the legal framework, international standards, network upgrading, and security services.

The following areas will be addressed:

- Business to Public Administration
- Consumer to Public Administration
- Public Administration to Public Administration3
- Public Administration to Consumer

The Papadopoulos Administration (2003 –)

The latest cabinet headed by Mr. Papadopoulos seems poised to continue on the footsteps of its predecessors. The new government has adopted several changes in its information society policy and has proceeded fast with the introduction of a new information systems strategy.

The current priorities and objectives of the information systems strategy of the Republic of Cyprus are the following:

- Improve Quality of Service to Public and Commerce
- Enforce Legislation
- Strengthen Internal Controls
- Reduce Costs
- Support Accession to the European Union
- Increase Revenue Opportunities
- Support e-Europe+ 2003 – Government online

The government policy has also identified the major success factors that may influence the evolution of the information society in the country. Among the factors the following are the most important according to the strategy of the government:

- Quality of Information: it is necessary to improve the quality of the available information in order to generate increased demand for Internet and eServices,
- Speed and availability of Services. Increase fast the share of broadband connections to reduce the time and costs of access to basic information,
- Management information: provide much deeper knowledge about how complex integrated it systems should be managed,
- Inter-communication and Inter-operability: a crucial need is to improve the connectivity of the existing systems
- Flexibility: the convergence between the existing systems should be improved
- Harmonization with EU Systems: the regulations and policies should be harmonized with the EU rules

The Vision of the government underlying its policy is the creation of an efficient and effective public service, which will be able to provide high quality services to the public with the least possible expenditure and, where possible, without the need of visiting any Government Department to obtain such services. The government has also identified that task which is needed for the achievement of the mentioned vision, which includes the following:

- One Terminal per Desk
- Intelligent Citizen's Identity Cards
- Paperless Office
- Distributed Services to Public and Commerce
- Reduction in Bureaucracy (quick response)
- Common Data Maintained in One Place
- Global Communication

The table below gives the status of the various projects that are implemented, visualized under the current information systems strategy of the Government.

Table: The status of projects under the current IS Strategy

Projects under current ISS

A. Completed before 2003

- Inland Revenue
- VAT
- Social Insurance
- Social Welfare
- Civil Registry
- Lands and Surveys (Registration of land, mortgages, mapping, GIS etc)
- Registry of Motor Vehicles
- Registrar of Companies
- Registrar of Co-op societies
- Factory Inspectorate
- Candidates placement to work
- Hospital Information System (under review of new system)
- Office Automation System
- Government Data Network
- Government Internet Node

B. Completed in 2003

- Customs System (Phase A EU requirements)
- Merchant Shipping
- Central Accounting System
- Portal of the Government of Cyprus

C. To be delivered by the end of 2004

- Customs System (Phase B and C)
- Legal Information System
- Courts Administration
- Government Gateway

The existing GDN and GIN will provide the connectivity between Government Departments both for Internet and integration of systems.

B.3. Other actors

Business Sphere

With the telecommunications sector being a monopoly, there have not been any other significant actors in IS. EAC's strategy to enter telecommunications may pose a threat to CYTA but at this moment this is only a plan. One can also mention the five Internet Service Providers Cytanet, Cylink, Logosnet, Spidernet, and Avamnet and the three Internet portals Cypria, Kyprosnet, and Yiasou. However, their presence is not significant in terms of policy or market share. CYTA's domination is complete. Hopefully, this is about to change.

Civil Sphere

There are some other actors in the IS sector of Cyprus. Semi-governmental or independent, most of them are related to research and development and are connected to IS as far as they initiate policies for the advancement of IS or are the means of implementing decisions regarding IS. Some of them are the Chamber of Commerce, the Cyprus Development Bank, the Cyprus Research and Academic Network, the Institute of Technology, and the Cyprus Research Promotion Foundation.[51]

Conclusions

While Cyprus was a late starter, it has been able in the past years to take large strides in IS. The existence and recent creation of institutions that will guarantee the effective operation of the decision-making bodies shows the positive steps taken. It is a democratic country where rules and procedures are respected.

In terms of IS, one has to marvel as to how much the country has progressed without a national IS policy. This comment may be surprising to the reader as we have already mentioned ISS. However, clearly ISS was not a stand-alone policy. It was part of an overall industrial policy with many different goals. Of course, most of these goals were facilitated by and used IS to achieve quicker rate of progress. This was a positive consequence of an otherwise unrelated policy.

The national policy lacked a clear goal, a level that would be deemed satisfactory. Until 2002, it was a hopeful attempt to play catch up with the rest of the world in every way possible. It was characterized by a lack coherent planning of inter-supporting projects aimed at improving specific area while exhibiting a sudden increase in the amounts of projects. This is the reason that presently policy makers are focusing on inter-connectivity and inter-operability. For example, in many cases, similar projects chose different systems, creating unnecessary confusion and decreasing their effectiveness.

At the regional level, one observes a total lack of policy and only individual efforts are able to change and improve the regional IS situation. With tourist attraction as the primary intention, local authorities are making ends meet the best way they can, they are using the Internet for marketing, usually to foreign customers, purposes, and have some good results to show for.

[51] In the order they are presented, their respective web-sites are: www.ccci.org.cy, www.cdb.com.cy, www.cynet.ac.cy, www.indusrtry.cy.net, www.research.org.cy

CYTA has done whatever it could to delay the liberalization of the market, in fact interrupting the policy-making cycle. Total absence of NGO activity in this area means that the government and CYTA are able to set policy goals without any non-parliamentary control. Granted the close relationship of the CYTA lobby with governments and its strength, this part of policy–making is deemed corrupt and lacks transparency.

B.4. SWOT analysis

The island of Cyprus has incredible potential and vision toward becoming a communication hub or link between Europe, the Middle East and Northern Africa as well as bringing the level of technology up to the level appropriate to their community status. There is much opportunity present to bring about these changes from various government funded foundations, EU initiatives, a large population of Cypriot expatriate scientists, and a filling IT pipeline from their universities. However a few recognized changes must occur in both funding and legislation by the government and encouragement of private firms to establish IT presence on the island. The current spending is indeed present but certainly not at the levels required to spring the society forward and head on into a technologically savvy world. The largest breakdown between the current state of affairs and the vision state seems to be the not so simple task of acting.

Strengths	**Weaknesses**
Democratic framework	Absence of independent national IS policy
Existence of institutions	Absence of regional policies
Utilization of EU policies, Framework Programmes	Absence of NGO's
IS deemed very important in terms of business development and included in industrial policy	Politicians not fully aware of IS importance
	Telecom a monopoly until 2002
Opportunities	**Threats**
Liberalization will increase competition and loosen CYTA's grip	CYTA and politicians not willing to continue on the path of IS expansion
Education will increase the importance of IS among young people	Will monopolistic practices continue?
Cypriot entrepreneurs pressure for reforms and open market	Policy goals not clear and coherent; undertaking of questionable projects

C. INDUSTRY AND SERVICES

The domestic production of IT-related products, including all hardware, software and the research associated with it, can be used as a direct measuring stick to the implementation of IT opportunities within a national community. This is certainly an area where Cyprus is in its infancy. At the moment most focus has been placed on the R&D side rather than the physical manufacturing or development. The government has set forth many programmes and supports many more in which research can be forwarded by cooperation and alliances among various IT professionals both on a national and international front.

One of the strong comparative advantages of Cyprus in the field of RTD, is the large community of distinguished Cypriot expatriate scientists. Several measures are being promoted in order to utilise this advantage, the most important of them being: the creation of data bases of the Cypriot expatriate scientists, which will assist in the establishment of communication channels, the inclusion of Cypriot expatriates in the lists of the Expert Advisory Groups of the Fifth Framework Programme, and the encouragement of the participation of Cypriot expatriates in the annual programmes for financing research projects, of the Research Promotion Foundation.

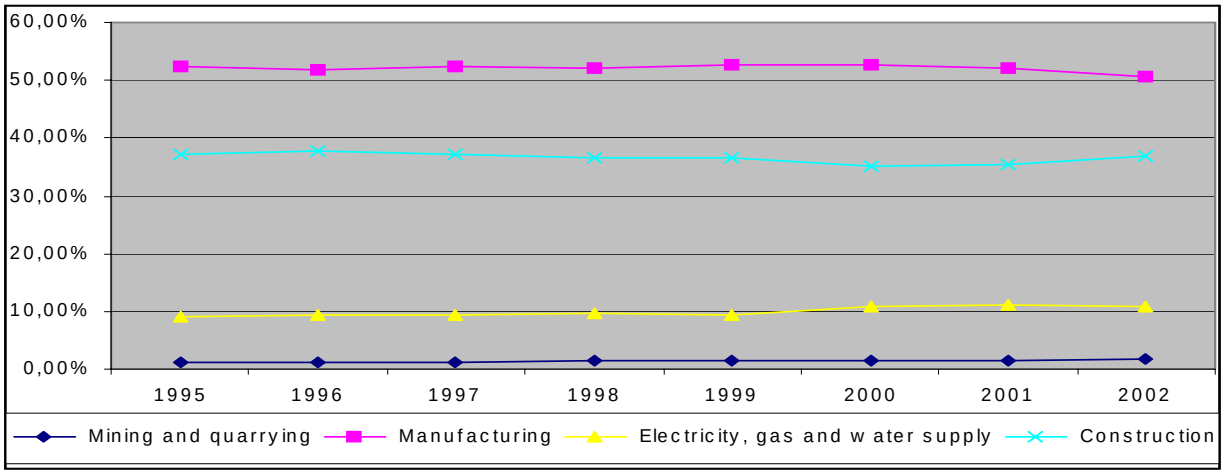
An additional asset regarding research and development is of course the IT research pipeline or up coming professionals. It is sure that Cyprus has placed great emphasis on education at a university and graduate level, which will continue to bring trained and motivated students to drive forward national IT.

To touch on manufacturing of hardware and software development, both of these activities are only just beginning on the island of Cyprus. Few firms are currently present doing either of these processes, but in the near future with the help of their pipeline and some governmental/EU initiatives an explosive trend should soon follow.

C.1. Industrial production

Graph C1 on the next page shows the structural evolution of the industrial production between 1995–2002 at current prices. The data was obtained from the Cypriot government web site. We have to mention that the figures for 2001 and 2002 are only provisional. Final data for these years were not published at all.

Graph C1: Evolution of the structure of the industrial production[52]



Source: Eurostat,

Manufacturing industry is the most important industrial contributor regarding the national income. However, it has relatively been in decline, with the gradual opening of the domestic market, through the liberalization of imports and the traditional manufacturing industries suffering from structural problems. In recent years, the efforts towards a gradual adaptation to the conditions of greater competition in the manufacturing sector have intensified. This is reflected in the relative containment of unit labour costs with an annual increase of 1.5% during the 1997-2001 period.

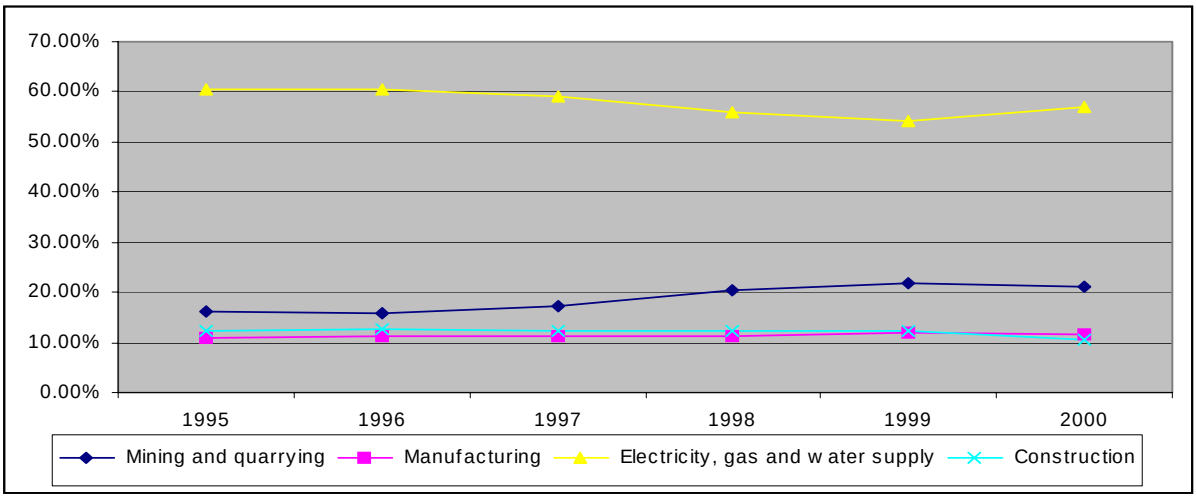
The investment activity increased as well.[53] It is followed by the constructions electricity, gas and water supply and finally by the mining and quarrying. As we can see, the second part of the last decade was a "calm" one for the Cypriot industry with almost no change in the structure of the industrial production. The picture is very similar in real terms as well due to the very low levels of the GDP deflator, which again is a sign of the economic stability.

The picture is almost totally different from the previous one if we regard the value added per employee of each of the sectors. In this case the electricity industry became the leader, followed by the mining, construction and manufacturing industries. Graph C2 below, presents the results. As we can observe, the share of the electricity industry in the total value added per employee was about 55–60%, being thus the most productive branch of the Cypriot industry. The manufacturing industry stagnated in this period from the value-added point of view, "competing" with the constructions for the last two places.

From these two graphs we can conclude that the manufacturing industry was a declining one in Cyprus in the recently passed period. Even if the added value was still the greatest one from the point of view of the national economy, its productivity, measured by the value added per employee is the worst one for the whole industry. The electricity, gas and water supply industry is a rising sector, in spite of the recent bottlenecks indicated by the slight decline in the productivity of it. Mining and quarrying is also a rising sector. However, its absolute value added to the national income is the least one. Finally, the construction industry is a stagnating one from the value-added point of view, but it has the worst productivity record.

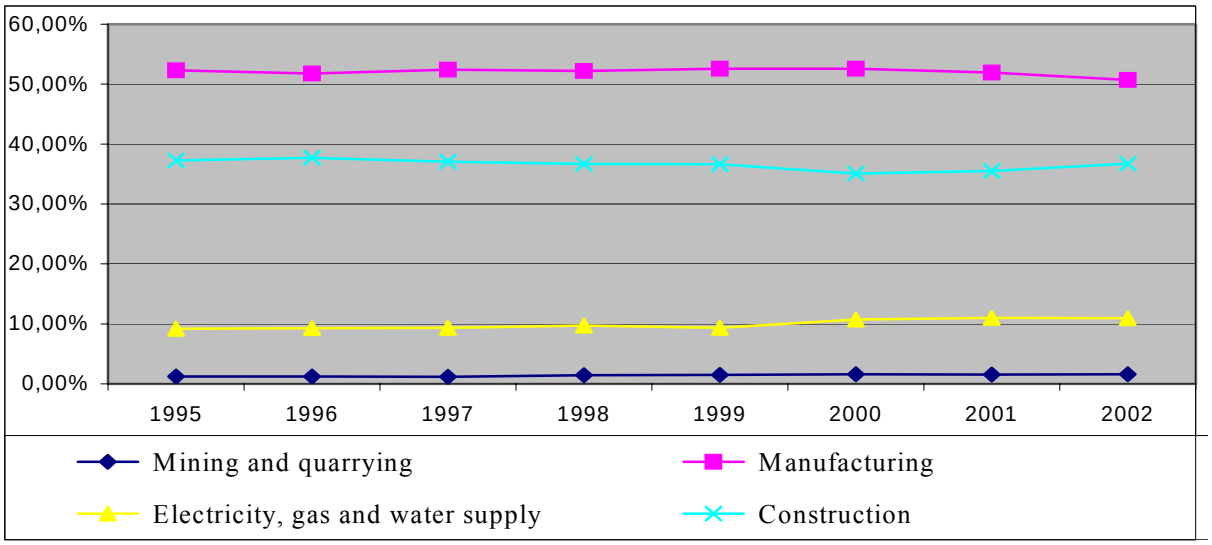
[52] Exact values can be found in Annex Table C2.
[53] Unfortunately we do not have enough and reliable data about the evolution of the investment activity.

Graph C2: Structure of the Value Added Per Employee as % of the Total Industrial Income[54]



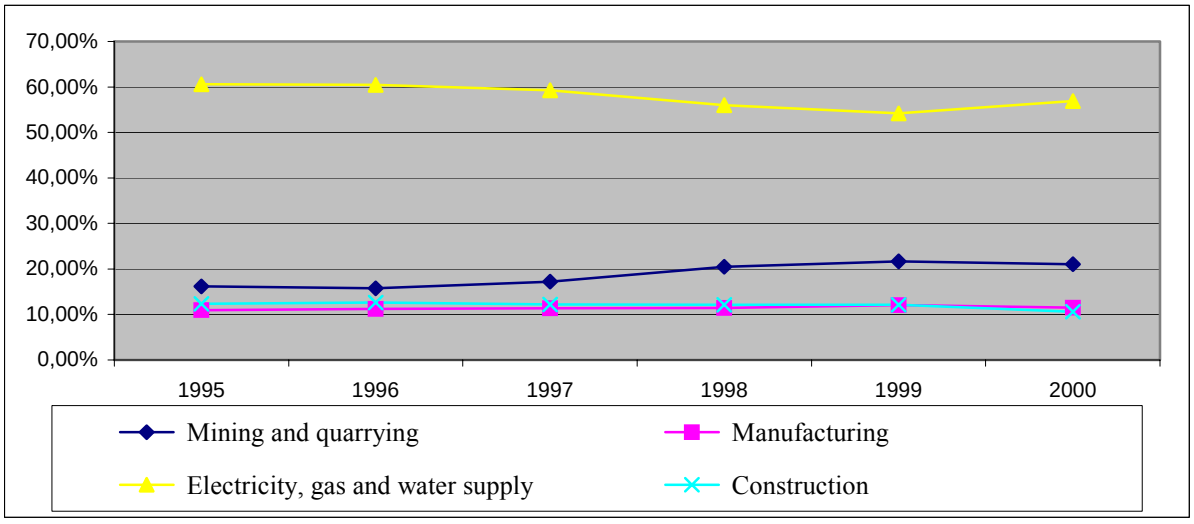
Graph C3 below and C4 on the next page present the same analysis for the service sector. We can see from graph C3 that the retail trade as well as the real estate, renting and business activities are the most important contributors to the national income regarding the services sector. This is followed by the hotels and restaurants and transport activities.

Graph C3: Evolution of the structure of the services sector[55]



[54] Exact values can be found in Annex Table C3.
[55] Exact values can be found in Annex Table C3.

Graph C4: Structure of the value added per employee as % of the total services income



Two things seem to be somewhat surprising: the high levels of the public administration and defence services as well as the more or less low ones of the financial intermediation even if the latter had a slightly increasing importance towards the end of the 1995–2002 period. The former (higher importance of the public administration and defence) might be explained by the fact that Cyprus is situated on an island, which needs more military and public protection than a continental country.

The latter might be explained by the general state-of-affairs of the economy in the examined period, international business climate, etc. The relative share of the tourism was correctly expected to decline in 2001 and 2002 as a consequence of the international demand for tourism, which can be linked to the political turmoil from the Eastern Mediterranean region, from Iraq, or to the importance of the September 11 events.

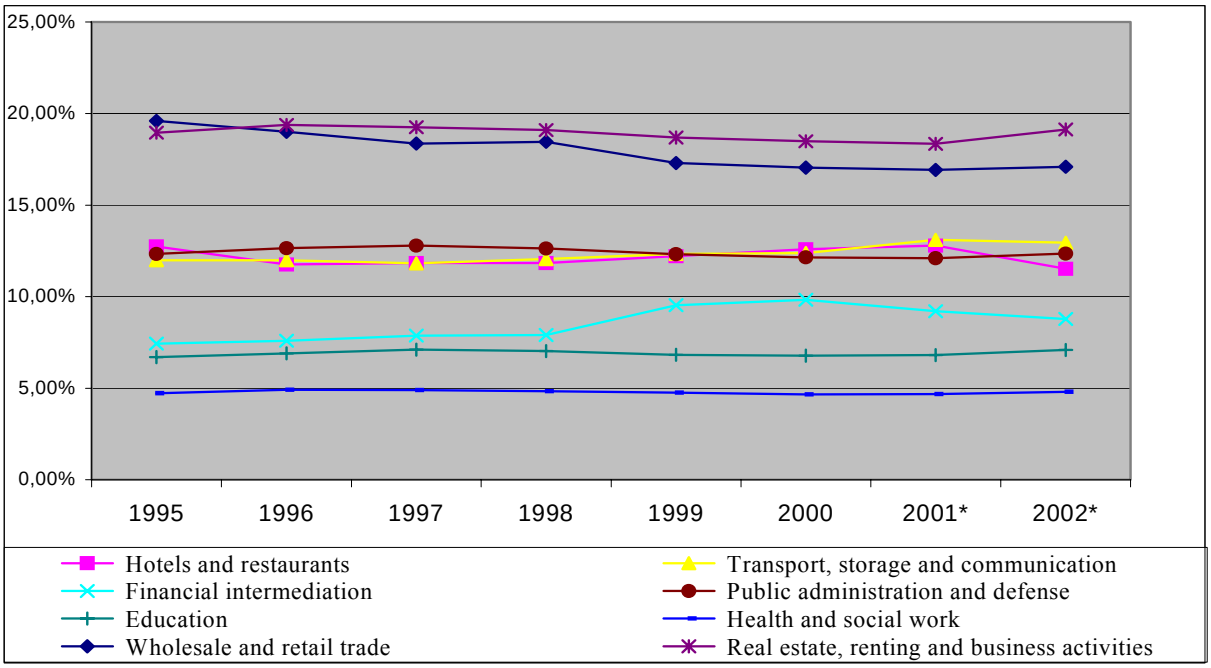
Even if the educational services have a low contribution to the national income the level of it is slightly higher than the same share of these activities from other accession countries. This might show a well thought-out educational strategy of the Cypriots. The share of the transport, storage and telecommunication activities have also increased slightly during the second part of the last decade.

In order to have a better judgement upon the situation from the services sector we need to examine the evolution of the productivity from this sector measured by the value-added per employee. Graph C4 above presents the structure of the value added per employee. We can see that the real estate, renting and business activities was a declining sector during the second part of the nineties, up to the recent past, when it seemed to reach a stagnating path regarding its productivity. However, it is still the most important sector for the Cypriot national economy. The evolution of the productivity of the other sectors was more or less stagnating, except for the financial intermediation sector, which had an increasing productivity share.

This is clearly a rising sector, becoming the second one as importance by the end of the nineties. We have to notice on the one hand that the education is the “second-best” sector of the public services. On the other hand, even if the wholesale and retail trade is a large sector, its productivity is rather low, being the worst performing branch of the services sector. The

transport and ICT sector was also a stagnating one during the second part of the nineties, being the third most important branch of the services sector on the whole.

Graph C5: Structure of the Value Added in Real Terms in 2000



Graph C5 above and Table C1 below show the most recent[56] and the average evolution of the productivity structure of the industry and services sector together. The highest productivity was reached in the electricity industry sector, followed by the real estate and other businesses, mining, transport and telecommunication and financial intermediation sectors. These are the most important activities for the Cypriot economy. It is important to notice that the public administration and defence services are also remarkably "productive" which is very important on an island, which is still economically, politically and socially significantly divided.

Table C1: Productivity shares of the Cypriot economy in %, 1995–2000

%	Average of the Period	2000
Mining and quarrying	**7.36%**	**8.45%**
Manufacturing	4.44%	4.60%
Electricity, gas and water supply	**22.44%**	**22.83%**
Construction	4.65%	4.25%
Wholesale and retail trade	3.94%	3.79%
Hotels and restaurants	4.45%	4.59%
Transport, storage and communication	6.98%	6.96%
Financial intermediation	**6.80%**	**7.39%**
Real estate, renting and business activities	**15.86%**	**14.95%**
Public administration and defence	7.14%	6.84%
Education	5.19%	5.06%
Health and social work	4.85%	4.68%
Other community social and personal services	4.67%	4.58%
Private households with employed people	1.23%	1.03%

[56] Data for 2001 and 2002 were not available.

C.2. SWOT analysis

Strengths	**Threats**
Well developed services Rising productivity of the financial intermediation and electricity sectors Highly productive public administration and defence services Well developed educational strategy	High sensitivity to international political situation
Weaknesses	**Opportunities**
Declining manufacturing industry due to structural problems Institutional weaknesses	Development and strengthening of new industries (e.g. IT, telecommunication, etc.)

D. PRESENCE OF THE MOST RELEVANT ECONOMIC ACTIVITIES FOR IST APPLICATIONS

D.1. Trends in R&D expenditures and structures

The expenditures on research and development (ERD) vary widely between the candidate countries. In 2000, while the ERD of the Czech Republic and Slovenia amounted to more than 1.30% of their respective GDP figures Cyprus, Latvia and Romania showed ERD/GDP ratios lower than 0.50%. Nevertheless, the acceding countries aggregate ERD/GDP ratio of 0.84% was less than half the EU average in 2000 and much lower than the US and Japan's levels.

Cyprus has always spent very little of its GDP on R&D activities. Table D1 below presents the dynamic evolution of these expenditures as the percentage share of the GDP. While at the beginning of the nineties this figure was at about 0.18% of the GDP, in the late nineties and in 2000 increased only slightly, reaching 0.27% of the GDP by the end of 2001. However, this value is still significantly low in both international and regional comparison too.

Table D1: Evolution of the R&D expenditures

	1991	**1992**	**1998**	**1999**	**2000**	**2001**
R&D Expenditure (thousands of EUR)	4.835	9.565	18.572	21.454	24.513	27.495
- in real terms	4.654	9.016	18.155	21.012	23.574	25.861
- as percentage of the Cypriot GDP	0.18%	0.18%	0.23%	0.25%	0.26%	0.27%

Table D2 provides an international comparison. As we can see, Cyprus was and it is still the very last country from this point of view, both within the group of the acceding countries and moreover within that of the EU member states. This is somewhat understandable, if we take into account the size and openness of the country, its economic, human and capital potential.

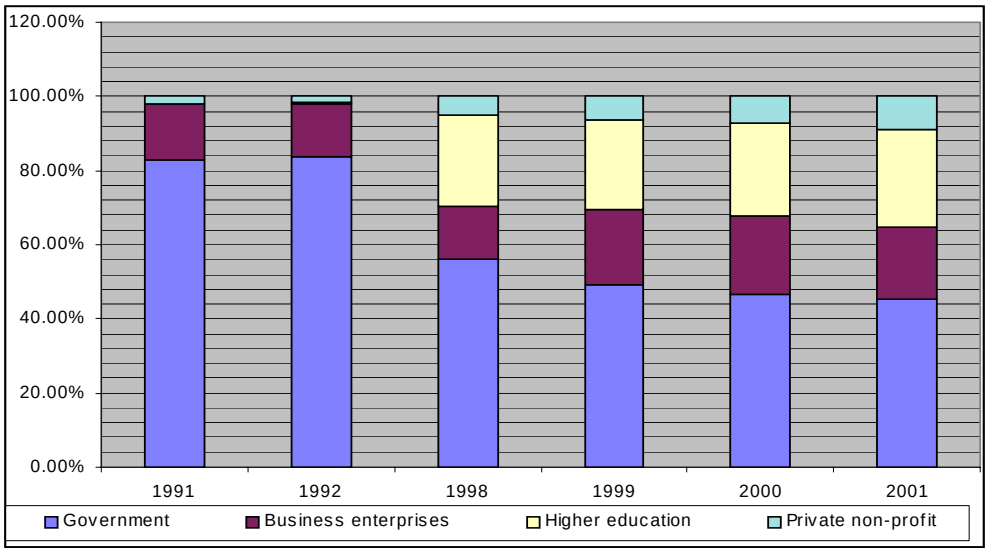
Table D2: ERD in the candidate countries and EU member states, EUROSTAT

	Mil ECU/EUR		**% of country GDP**	
Year	**1995**	**2000**	**1995**	**2000**
Bulgaria	62.00	71.50	0.62	0.52
Cyprus (1)	**18.20**	**24.50**	**0.23**	**0.26**
Czech Republic	403.00	744.00	1.01	1.33
Estonia (1)	30.10	37.00	0.61	0.66
Hungary	250.40	405.30	0.73	0.80
Lithuania	17.80	37.50	0.53	0.48
Latvia	22.00	73.10	0.48	0.60
Poland	672.70	1196.60	0.69	0.70
Slovakia	138.30	142.90	0.94	0.67
Denmark	2530.60	3604.20	1.84	2.07
Germany	42437.90	50316.40	2.26	2.48
Spain	3623.80	5719.00	0.81	0.94
France	27446.60	30152.70	2.31	2.13
Austria	2797.40	3687.50	1.56	1.80
Finland	2262.70	4422.60	2.29	3.37
UK	17097.20	28757.40	1.97	1.85
Acceding countries (1)	2477.00	2958.20	0.83	0.84
EU-15	124427.00	163937.00	1.89	1.93
(1): 1998 instead of 1995				

Graph D1. below presents the evolution of the structure of the ERD by sector of performance. Unlike in the EU, where the business enterprise sector is the foremost performer of R&D, in Cyprus the government sector still dominates R&D even if in a decreasing manner. It is followed by the higher education and the business enterprises sector. The private and non-profit sector had initially a low share, but its importance in the R&D involvement is growing nowadays.

The trend seems to follow the European trend: shifting the importance of involvement from the governmental sector towards the businesses and higher educational institutions. However, this will take somewhat longer time, which may be due exactly to the small size of the country and to the fact that the country seems to be rather oriented towards trade, tourism and financial intermediation than to expensive research activities.[57]

Graph D1: Evolution of the structure of the ERD by sector of performance

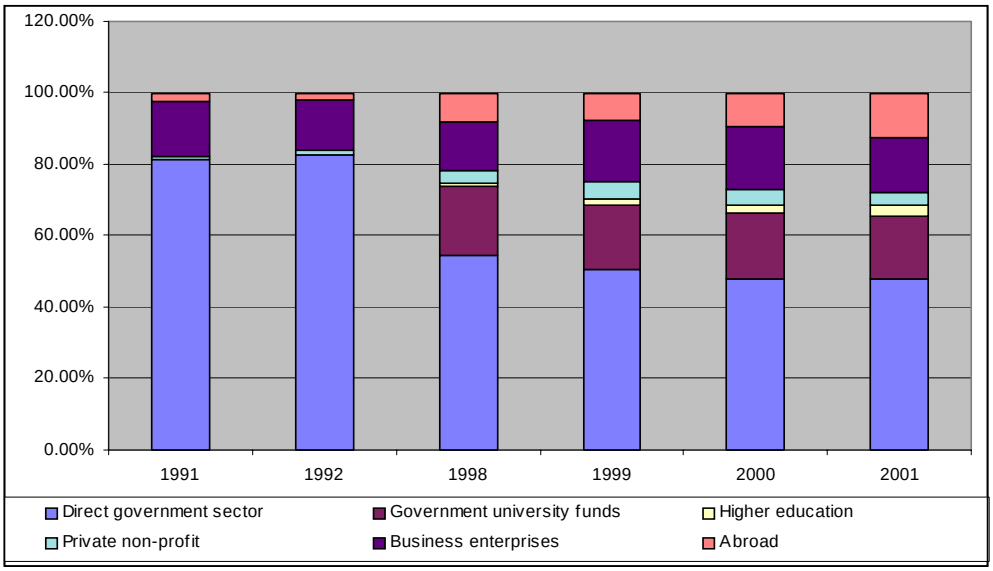


Graph D2 on the next page presents the involvement of the different sectors by the size of the funds allocated for R&D. The main provider of funds for R&D was and it still remained the governmental sectors being implied directly or through the national educational institutions. Two trends can be observed during the nineties.

First, the governmental funds are shrinking year by year making room for the business sector and – what is even more important and also interesting – for the foreign capital. Second, there is a shift from the direct implication of the government towards the presence through education. This implies indirectly a qualitative increase of the Cypriot educational system.

[57] Exact values can be found in Annex Table D5 and D6.

Graph D2: Evolution of the Structure of the ERD by References of Funding (%)



Graph D3 below shows the distribution of the ERD according to the main fields of science. There is an obvious shrinkage of these expenditures directed to the agricultural sector. This may seem to be a bit surprising if we take into account the agricultural (and more specifically for example the soil conditions) conditions from the island, which would demand a higher investment into the agricultural production. On the other hand, it may be conceivable that the domestic production is substituted by imported products and thus there is no need for an increased support of the agriculture. On the other hand both natural and social sciences benefit of more attention at the expense of the agriculture, and that of the engineering and technology. It is somewhat surprising that the R&D activity in Cyprus is more labour than capital intensive (Table D. below). However, this might be explained by the relative unimportance of the ERD in Cyprus (reflected by the ERD/GDP ratio).[58]

Graph D3: Evolution of the Structure of the ERD by Main Fields of Science (%)

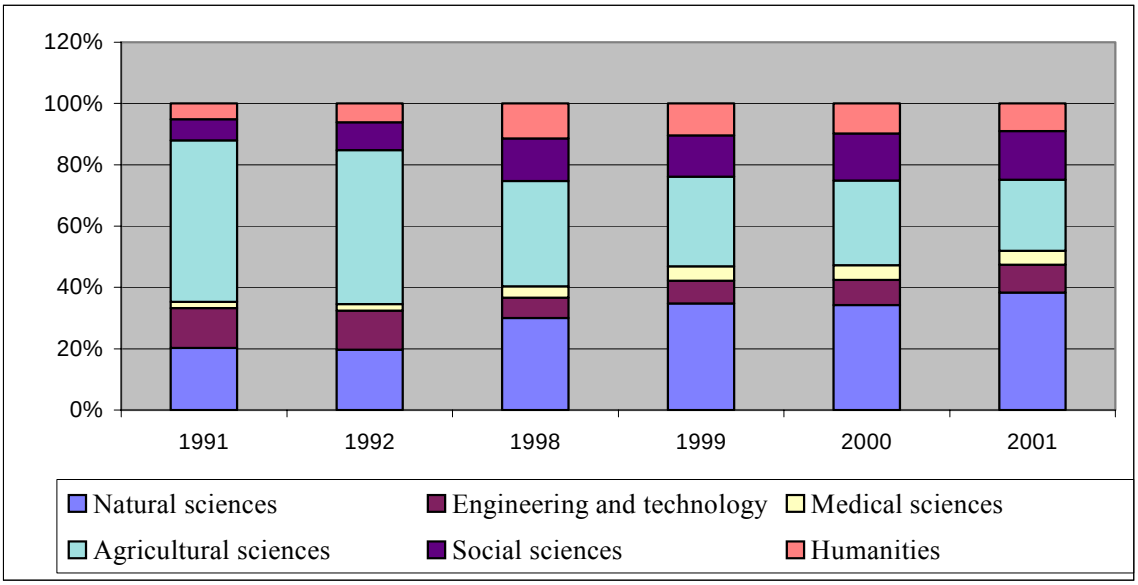


Table D3: R&D by type of expenditure in %

%	1991	1992	1998	1999	2000	2001
Labour costs	69.70	68.66	69.05	69.60	67.47	66.35
Other current expenditure	13.61	17.50	20.03	21.10	20.59	22.66
Capital expenditure	16.69	13.84	10.92	9.30	11.95	11.00

Table D4 below shows the distribution of the employees involved in R&D activities by qualification. According to the general trend observed in the acceding and candidate countries researchers is the core of the R&D personnel workforce, representing about 50% or more of all R&D personnel. Technicians and other personnel make up the rest of the R&D personnel (Frank, Suzana 2003). From this point of view Cyprus may be considered as being an exception, because of the – somewhat – higher share of assistant personnel. On the other hand, there are too few employees implied in R&D activities.

Table D4: distribution of the employees involved in R&D activities

	1991	1992	1998	1999	2000	2001
Researchers	39.59	40.16	42.02	40.91	44.56	48.26
Technicians	44.87	45.08	29.79	29.03	28.68	27.10
Other supporting staff	15.54	14.75	28.19	30.06	26.76	24.64
Total full time employees (head)	341	366	564	682	680	690

D.2. SWOT analysis

Strengths	**Threats**
Increase of the foreign capital in the R&D activities Good quality of the domestic workforce	
Weaknesses	**Opportunities**
Low level of ERD Still significant dominance of the government participation Small number of researchers and related personnel Relative under-utilization of the highest qualified group (researchers)	Shrinkage of the importance of the government Slight increase of the ERD/GDP ratio Growth of the IT sector Increasing importance of knowledge intensive sectors

[58] This may mean for example that on the island there are no massive investments in R&D of such companies like pharmaceuticals, of some actors of the hi-tech industry, which could produce a lot of ERD. Naturally, this does not mean that the Cypriot researchers are of weak quality.

E. INFORMATION SOCIETY TECHNOLOGIES (IST) PENETRATION

E.1. Introduction

The collection of data regarding IST penetration rates is quite difficult in the case of Cyprus. As part of the SU-ESIS programme, data is largely available until 2001. However, after the end of the programme, no major survey has been organized in a coherent way to measure the development of IST on the island. This in itself is a sign of the rather low level Internet services and their importance to people and businesses. We will follow the concluding survey of EU-ESIS, providing information and analysis of the data. Moreover, some more information from other sources will be offered that will complement this particular survey and help the reader attain a comprehensive view of IST penetration in the case of Cyprus.

E.2. Telecommunication data

In a very basic sense, the advancement of a country's IT focus can be related to the infrastructure within the telecommunications industry. The telecom industry tends to be far reaching and expansive allowing for a natural infrastructure that can be used for further technology advancement.

The following are various statistics concerning the infrastructure within the island of Cyprus:

- average cost of a local call $0.03
- land line telephones in use 405,000 Greek Cypriot & 83,162 Turkish Cypriot (1998)
- domestic telephone system is said to be in excellent condition in both the Greek and Turkish Cypriot areas, the system is open wire,, fibre-optic cable and microwave radio relay
- international telephone system is troposheric scatter, 3 coaxial and 5 fibre-optic submarine cables
- satellite earth stations - 3 Intelsat (1 Atlantic Ocean and 2 Indian Ocean), 2 Eutelsat, 2 Intersputnik and 1 Arabsat
- can access 204 countries directly from telephone service
- telefax, telex, audiotex and videoconferencing are all capabilities
- data transmission service is offered by either public switched telephone network, point to point leased circuits or via the packet Switched Public Data Network (CYTAPAC)
- participated along with 53 other countries in the SEA-ME-WE 2 project, a submarine fibre optic cable system connecting the Far East with the Middle East and Europe
- the research infrastructure is being supported by the government of the Republic of Cyprus by promoting the connection with the European Research and Academic Network QUANTUM/QMED

E.3. Domestic market size

There is quite a difference between the purchasing power parity in the Republic of Cyprus and the Republic of Northern Cyprus. The GDP of the Republic of Cyprus (2001) is $9.4 billion in comparison to that of the Republic of Northern Cyprus (2002) at $787 million (35) It is therefore not surprising that there exist more funding opportunities for IT research in the

Republic of Cyprus. Yet even with the programmes in place, the money allocated to the IT field is quite small in comparison to the GDP, the spending is on the order of 0.07%.

In general for both Greek and Turkish Cyprus, the level of spending on IT related expenditures needs to increase in order to bring the island up in the technological community. It appears as though discussion is progressing in the government to bring forth more effort and energy aimed at increasing their IT position. This increase would certainly benefit the island as it has an incredible location advantage situated in the middle of Europe, the Middle East and Northern Africa.

E.4. Presence of IST in enterprises

The rapid growth of the IS sector is also shown by the increase of the computer market size. Since 1996, the computer market has almost doubled, from EUR 49.2 million to EUR 80 million. According to EU-ESIS, this development is mainly due to the increase of the market for computer services rather than the one for hardware. This fits the pattern for strategic growth employed by the Cypriot's governments since 1998, whose goal is to make Cyprus an international centre for services.

E.4.1. Commerce

Internet penetration in Europe averages to 3.7%. Cyprus with a percentage of 30% within households (and a total of 41% Internet access including households and other points of connections) is very close to the Europe's average. However, only 12% of Internet users buy on-line - comparing to the Europe's average of 3.6% - less than 5% of the total Cypriot population. Although the proportion of businesses with Internet access is as high as 92% and the majority (51%) possess Internet access, the proportion of the Cypriot firms selling online is not measurable. The main constraints doing eCommerce are the lack of eCommerce education, awareness and of confidence in eCommerce transactions. Further obstacles are the problems with e-payment and security and regulatory and legal framework.

E.4.2. Online media, portals, marketing

Table E1:

Main Internet Service Providers	
Company	**Number of Subscribers**
CYTANET	29000
CYLINK	4000
LOGOSLET	8000
SPIDERNET	14000
AVAMNET	3000

Reference: www.eu-esis.org

Table E2:

Main Portals	
Name	**Internet Address**
Cypria	www.cypria.com
Kyprosnet	www.kyprosnet.com
Yiasou	www.yiasou.com.cy

Reference: www.eu-esis.org

E.4.3. Telecom and computer market size

Graph E1: Telecom and computer market size (in EUR million)

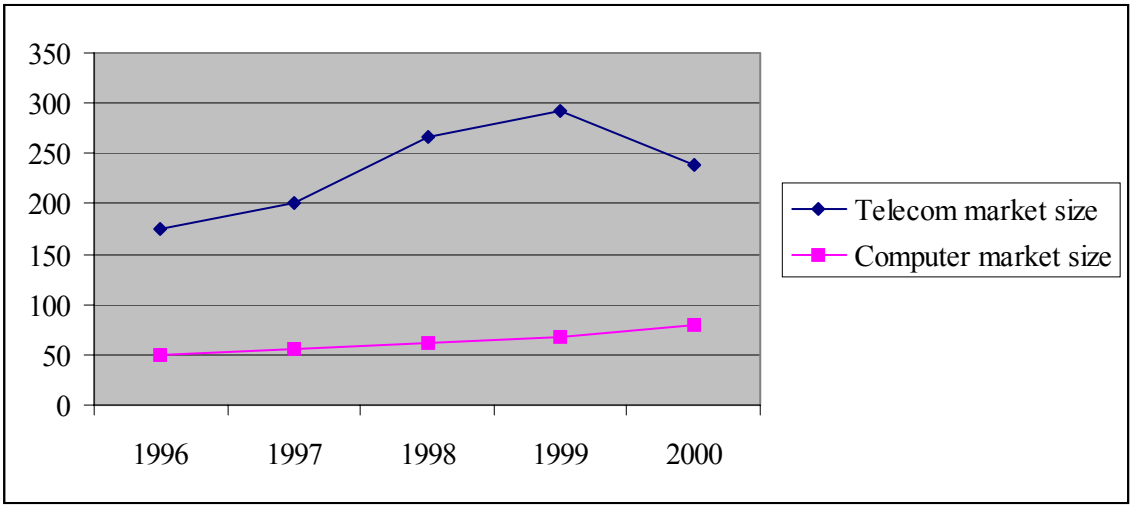


Table E3: Telecom and computer market size (in EUR million)

	1996	1997	1998	1999	2000
Telecom market size	175	200	267	293	238
Computer market size	49.2	55.6	62	67.4	80

Reference: www.eu-esis.org

E.5. Presence of IST in government, public administration and public service

E.5.1. e-Government in Cyprus

The Information Systems Strategy of the Republic of Cyprus, which was adopted by the Council of Ministers early in 1998, was a revised version of the Government Computerization Plan which was prepared in 1988. Currently there have been some minor revisions to the ISS to provide for Web-enabled systems and the requirements of e-Europe+ action plan.

The government has almost completed the development of the strategic projects that were defined in Information Systems Strategy (ISS) and they have moved them on the web so as to provide citizens with the facility to get services from anywhere. In order to achieve this the government proceeded with the interconnection of government systems over the Government Data Network and provide for the creation of secure gateway on the web.

It must be noted that the first e-Government system has already been released by the government and is serving the public over Internet, in this case the community of traders since it is the Automated Customs System called THESEAS, about which more information is provided in the table on the next page.

Table: THESEAS – Computerized customs system

Overview

The THESEAS system is the first fully integrated and web enabled Customs system in Europe at this time. The system is currently in production and is fully in line with the requirements for EU Accession, some 9 months in advance of the Accession date.

It is designed for the traders to connect to the system via the Internet for the electronic submission of cargo and import declarations. Furthermore, the system is also designed for the electronic payment of customs duties through the banks. All customs stations are connected to the system via Intranet operating over the Government Data Network. An interface exists with the Cyprus Ports Authority for the electronic submission of cargo manifests and a standard XML development has been made available to the traders for bulk input to the system.

The system is designed to enable the interface with the Customs systems of the EU and specific modules have been developed to ensure the interoperability with the systems of DG TAXUD.

Aims of the THESEAS Project

The overall aim of this project is to reform and modernize the Customs and Excise department. In addition, the programme aims to support the accession of Cyprus to the European Union through the harmonization of legislation and procedures supported by the use of Information Systems.

The project contains a number of administrative reform and trade facilitation components aimed at examining current practices and procedures within the Customs and Excise Department in order to take appropriate action for the introduction of reforms aimed at improving efficiency of operation and simplifying official formalities and documentation.

Scope of the THESEAS Project

The scope of the project covers the following operating modules:

- Intelligence modules
- Goods processing modules
- Revenue Collection and Accounting modules
- Passenger processing modules
- Enforcement modules
- Activity processing modules (Management Information System)

The external interfaces of the system are the following:

- Channel interface handling the diverse media for accessing the system
- Information interface with the data repositories in use in the public sector
- Management interface with the processes in charge of the operation of the Department
- Client interface with the diverse partners of the system

Interconnection of Systems / Web Enabled

The core systems (Civil Registry, Lands and Surveys, Registrar of Companies) that own data required by other ministries/departments have been completed. Now it is both possible and required to interrelate these systems.

The completion of the infrastructure projects (i.e. Office Automation, Government Data Network (GDN) and Government Internet Node (GIN)) facilitates the above target.

1. The rollout of the Office Automation, which handles automated procedures for office work, has already started and the system is successfully installed in the following government departments according to a prioritisation plan:
   - Department of IT Services
   - Ministry of Finance
   - Secretariat of the Council of Ministers
   - Permanent Mission of Cyprus in Brussels
   - Central Information Service

   In order to complete the rollout of OAS we have to install it in about 50 other ministries/departments/services, the most important of which are:
   - District Courts and High Court
   - Law Office of the Republic
   - Ministry of Foreign Affairs
   - Press and Information Office
   - Ombudsman
   - Police
   - House of Representatives
   - State Archives
   - Public Administration and Personnel Services

2. The GDN which is related with the connectivity of all government ministries/departments using ATM technology with a backbone of 622 Mbs speed has been completed and its rollout started.

3. The Third infrastructure project, which is the building of a Government Internet Node (GIN), was completed and the rollout started. The aim now is to provide secure access to all government employees by the end of this year. All civil servants will have an e-mail connection and an access to Internet by the end of 2004. The government web site was released in the year 2001 (http://www.cyprus.gov.cy) and there is a plan that by the end of this year all government departments will have an informative www.site so as to comply with EU requirements resulting out of e-Europe+ (level 1 basic information on the web for citizens, level 2 downloading of forms and level 3 interaction).

In addition, a Data Management Strategy has been drafted since 1997, which provides an integrated information structure capable of supporting its requirements for strategic and tactical management information systems as well as operational systems. This is an essential component for the interconnection of our information systems as well as for the creation of a central Government Data Warehouse.

To be effective, data integration must rely on the different applications underlying with the meaning of the data that is being shared or interchanged. Thus a key factor is the availability and use of a common model, which clearly defines the meaning of the data held in the different applications. This common model was provided through the medium of the Government Data Model (GDM), which defined all Government strategic data. The strategic

data for the Government of Cyprus (i.e. that data which is used by more than one operational information system) is based on the data models of the Civil Registry, Lands and Surveys, Registrar of Companies. Furthermore a strategy for e-government has been prepared, which provides inter-alia for the following:

- Creation of a government portal based on an event life cycle approach
- Creation of a government secure gateway which will be responsible for authentication, security, encryption and web workflow
- Interconnection of all existing systems via the gateway and the provision of services to the public over Internet using GDN, GIN and the portal.

The current year was devoted mainly to the following:

a. Transform completed information systems into web-enabled systems in order to give information and services to citizens and businesses e.g.

- Submission of Income Tax and VAT returns via the web
- Enrollment of unemployed people and placement in work via the web
- Submission of Applications via the web for child allowances
- Social Security functions via the web

b. Draft a Data Warehouse strategy after the approval of the Computerization Executive Board.

c. Give government information services to the public via Internet.

Organization to manage e-Government

The government has recently decided to set up a Programme Management Unit at the level of the Ministry of Finance, outside DITS which is the department responsible for the implementation of the strategy, to monitor the progress of the programme, prepare suggestions to the Minister of Finance for the of the strategy etc. This unit will be headed by a Programme Manager and assisted by two Project Management Consultants. All of them will be recruited from the open market through international tenders.

Box. The e-government.gov.cy

Vision

"To enable citizens to interact via the web or otherwise with Government by the year 2004".

- In achieving this vision an Internet-based web site that aggregates all government information and services in one place is to be designed, implemented and given to the public. It is intended to be the primary place where citizens will seek information about government services and to transact with Government on-line.
- Essential components needed to give effect to the above mentioned vision are the following:
- Portal of the Government based on life-events-cycle,
- A gateway for security/authentication of all those accessing the web-site providing inter-alia with the use of work-flow the interconnectivity of all the legacy systems communicating via XML.
- The primary objective of **"eGovernment.gov.cy"** is to provide citizens with a simple, secure and fast way of accessing a wide range of joined up government services on-line.

Architectural frameworks

The framework below positions **"eGovernment.gov.cy"** in relation to government. It also presents the "route-map" of infrastructure, which will enable the coherent integration of government to join up services to meet the needs of the citizens.

(i) At the "front end" the principal entry point will be **"eGovenment.gov.cy"** i.e. the Government portal.

(ii) The "middleware", the tier that enables government to join up in a coherent way is "Government Gateway".

(iii) The "back-end" consists of government departments, and other systems

e-Commerce

In this context the Government of Cyprus has established a Ministerial Committee for the promotion of the Information Society in Cyprus. This committee has delegated authority to the Planning Bureau of the Republic to deal with e-Commerce in Cyprus. Planning Bureau has already awarded a Tender and a firm of consultants prepared of a study for e-Commerce in Cyprus, which included the following:

- Assessment of the existing legal framework and suggestions for changes
- Provide the necessary assistance in the formulation of a strategy and a plan of action to encourage and support the exploitation of e-Commerce activities in Cyprus
- Complement the Planning Bureau mission directorate for Economic Relations with EU
- Following up the developments in EU
- Evaluation of the implications on the Cyprus economy
- Preparation of studies, policy positions and recommendations
- Development of a legal and institutional infrastructure that will form the framework for the promotion and operation of e-Commerce in Cyprus.

In parallel, legislation has been prepared for the protection of personal data and for digital signatures. The first bill has already been enacted by the Parliament. The consultants delivered the study in July this year and the implementation of their suggestions has already started.

E.5.2. IST in public administration and service

After the introduction of the 'Information Systems Strategy' (ISS) of the Cypriot government, Cyprus has improved drastically in the amount of services provided to citizens via the Internet. A priority of the government has been the interconnection of departments and their connectivity to the Internet. A lot of emphasis has been placed on the completion of projects relating to the infrastructure. The Government Data Network has been completed, which is a means of connecting all governmental departments. It is using ATM technology and has a backbone of 622Mbs speed.[59] Office Automation was the project that initiated the expansion of computer and Internet use in the government in 1987 and is almost completed. In addition, the government is rolling out an Internet/Intranet/Extranet project that will enable civil offices to have connection to the Internet and communicate with each other. A recent development

[59] unpan1.un.org/intradoc/groups/public/documents/apcity/unpan005093.pdf

and a project carried out with the help of the EU is 'Ex Libris.' It is aimed at office and systems integration and is thought to be a major part of the eGovernment strategy of Cyprus.

E.5.3. IST in central administration

Since most of the infrastructure is now in place, emphasis has shifted to information management. Moreover, the ISS primary focused on the functioning of the central administration. One of the main activities of the programme was for ministries to organize internal Information system strategies and the implementation of programmes. The ministries will allocate parts of their budgets for the most promising projects, according to the goals set by the Minister and the government.

The Ministry of the Interior has announced the introduction of a new ID card that will replace the traditional plastic identification cards. The goal of the project is to make information about a citizen easily accessible to different parts of the administration without forcing the citizens to bring extra papers and without delays until documents are found. It will contain all the traditional information of an ID card (name, date of birth, etc.) but will also include a microchip that will store valuable information about the holder. All ID cards will be connected to a central database that will verify the data and facilitate its transmission to different departments, according to the wishes of the citizen. For example, if a citizen would like to renew her passport, the only thing needed would be her old one and the new ID that will contain all pertinent information. This project has wide applications in administration, e.g. in health insurance, tax, and education areas.

The most active of all ministries in the areas of IST is the Ministry of Finance through its office of Information Technology Services. Its activities are not limited to the Ministry itself but it is assisting most other governmental departments. It has already completed the following projects:

- Social Insurance System
- Computerized Integrated Land Information System
- Office Automation Pilot Project
- Road Transport System
- Taxation System
- Registrar of Companies and Official Receiver
- Candidate Placement System
- Factory Inspection System
- Civil Registry
- Government Data Network – currently at roll-out stage
- Cooperative Development
- Social Welfare Services - the core module of the system, Public Assistance has been implemented.
- Health Information System - currently at roll-out stage
- Internet Project - currently at roll-out stage

The following projects are currently in progress:

- Ministry of Agriculture Information Systems Strategy Study- individual project implementation has begun.
- Public Works Department Information Systems Strategy Study- individual project implementation has begun.
- Merchant Shipping (development stage).
- Customs & Excise (development stage).
- Financial and Management Accounting System (development stage).
- Courts Administration (scoping study acceptance stage).
- Legal Information System (tender procurement stage).

Following the Ministry of Finance's footsteps, the Ministry of education is also quite active in IST matters. It has recognized the need for IS education from an early stage, especially in the areas that are important for Cyprus: information and database management and Internet use. It initiated a 'Computerization Programme' for all elementary and secondary schools that will equip schools with PC's and Internet connection. Teachers are attending workshops to attain the necessary knowledge to help their pupils with the use of PC's and the Internet. Except from the IS class prepared together with CICSO Systems, high schools will begin to offer more classes related to IS. In 2001, 20 out of 53 high schools and universities released a web-site while 24 out of 428 primary and secondary schools offered one.

Table E4: Ratio of primary and secondary schools and highs schools and universities with web-site

	Total Number of Institutions	**Institutions with web-site**	**Web-sites/total number institution**
Primary and secondary schools	428	24	5.6%
High schools and universities	53	20	37.7%

Reference: EU-ESIS, 2001

EU-ESIS offered some information about the development of IS in the Cypriot government. The following tables summarize the results.

Table E5: Development of IS in the Cypriot government

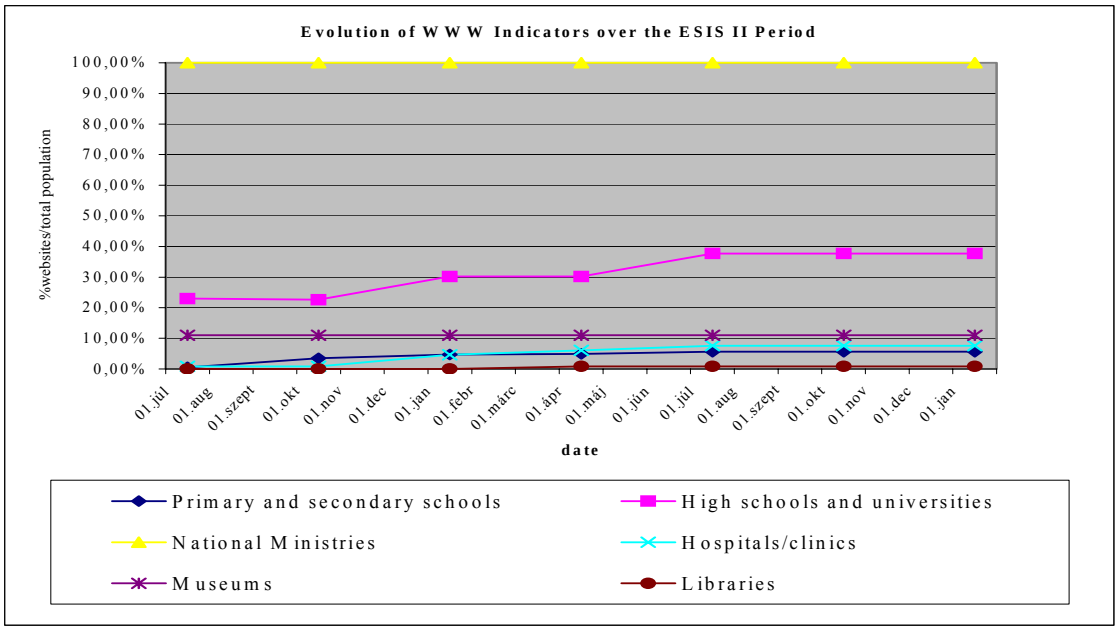
	Total Number of Population	**Total Number of Population**	**Web-sites/total number of population**
National Ministries	11	11	100,0%
Regional and local authorities	n.a.	11	n.a.
Hospitals/clinics	131	29	7.6%
Museums	37	10	11.0 %
Libraries	124	n.a.	0.8%
Total	817	99	n.a.

Table E6: Evolution of WWW indicators over the ESIS II Period

	Jul-99	Oct-99	Jan-00	Apr-00	Jul-00	Oct-00	Jan-01
Primary and secondary schools	0.50	3.50	4.70	4.90	5.60	5.60	5.60
High schools and universities	23.00	22.60	30.20	30.20	37.70	37.70	37.70
National Ministries	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Regional and local authorities	n. a.	n. a.	n. a.	n. a.	n. a.	n. a.	n. a.
Hospitals/clinics	0.80	0.80	4.60	6.10	7.60	7.60	7.60
Museums	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Libraries	0.00	0.00	0.00	0.80	0.80	0.80	0.80

Reference: www.eu-esis.org, January 2001

Graph E2: Evolution of WWW indicators over the ESIS period



The conclusions are positive regarding Cyprus' effort to develop and implement an eGovernment stately in central administration. In the span of 2 years, Cyprus has increased its use of IST significantly. However, much is to be done in regional administration.

E.5.4. IST in local administration

The government does not provide any support to local authorities in setting up their web-sites. However, local governments are quite active in the area of IS. Despite the lack of assistance, the Union of Cyprus Municipalities (UCM) as well as the Union of Cyprus Communities (UCC) has created web-sites.[60] The site designed for UCM is the more useful of the two and provides information about its members, about the activities of local authorities in Cyprus, the legal framework governing their operation, documents 'mostly asked for' by citizens, and

[60] www.ucm.org.cy, www.ekk.org.cy

information about civil marriages. UCC's site is designed along the same lines but with less information.

Many municipalities (13 out of 33) themselves have developed a web-site. The underlying strategy behind this movement towards the Internet has been tourism. Cyprus' economy is based on income from tourism. This effect is exaggerated in the case of local communities, whose budget largely depends on tourist inflows. Therefore, most of the municipalities employing the Internet aim at marketing themselves as ideal places for vacation. This is shown by the emphasis on the 'natural beauty' of each city, its beaches,[61] the museums, and the history of the region. Following this line of thinking, all of them offer civil marriage services. Of course, more information is given about the operation and services of each municipality but their goal is quite obvious.

E.5.5. Case study - The Strovolos web-site.

Strovolos is a city of 70 000 inhabitants close to Nicosia, in the centre of the island.
What is interesting about its site is that it is not dominated by information regarding tourism since the city itself is not the main tourist attraction of the island. Moreover, it is much more developed than the web-sites designed for the rest of the Cypriot local authorities.

In the introductory page, one is greeted with a pleasant surprise. The municipality offers a short video regarding the history of the city, something that can not be found in any other authority's site. The site is divided into two parts: one about the structure of the municipality and one about its activities. The following can be found in the first part:

History
Municipal Council
Organization map and telephone numbers of officers
Contact information and telephone numbers of offices
List of all municipal committees
Civil Marriages
Information and telephone number of the Office of Complaints
Schedule of current events
Weather information

The second part includes links regarding the following themes:

Geographical Museum
Comprehensive Centre (a centre for children and the elderly)
Advisory Centre
Library
Children's Choir
Municipal Choir
Gymnasium
Theatre
Parks

[61] Agias Napas' introductory page is a good example: www.agianapa.gov.cy

European Union programmes
Development projects
Seminars

Moreover, the site includes an archive of all past news and information, a direct link for filing complaints, and a page of all current announcements. It is updated quite often. Overall, the quality and service provided by this site is higher than the average. However, even in this case one can observe the lack of e-administration in the Cypriot local government. There is a limited amount of applications and procedures that can be fulfilled on-line. The Cypriot government has taken measures to rectify the situation on a national level and has largely succeeded. The condition of the local administration still is in need of urgent improvement.

E.6. IST in households

E.6.1. Penetration rates of media/telecom

Since the liberalization of the sector, media has taken off in Cyprus. It seems that this was the greatest obstacle that hindered their development. Currently, the media sector is working under open competition. As a consequence, more and more media sources are available to people.

Table E7: Available media sources in Cyprus in 2003

MEDIA TYPE	Number
Daily Newspapers	7
Weekly Newspapers	18
Other Newspapers	12
News Agencies	1
Periodicals	39
TV Stations (local)	6
TV Stations (national)	6
Radio Stations (local)	39
Radio Stations (national)	10

Reference: EU-ESIS and ITU

Cyprus' telecom infrastructure was well positioned for the arrival of the Internet. It has already achieved 100% digitization of its telephone lines. By now, the telephone coverage of the island and telephone penetration is at a 100% level.

Since 1996, Cyprus experienced a boom in terms of mobile phone services. In 2001, mobile phone penetration was 28.8%. One has to keep in mind that this development took place under difficult conditions, that is, under the monopoly of CYTA. Healthy competition conditions would heave boosted the trend. Since the Cypriot government has lately shown its willingness to open the mobile phone market, a second license is being auctioned at the moment, one should assume a bright future for the mobile phone sector.

A similar take-off can be observed in the amount of people using ISDN lines. Although at an infant stage, the growth rates of ISDN usage shows that more and more people and businesses are interested in IST. The decrease of connection rates facilitated by competition, and in

particular because of the threat of competition (imminent liberalization of the market,) coupled with the policy of CYTA to increase domestic all prices will accelerate the process.

Overall, the satisfactory quality of telecommunications services on the island has improved even more and is on par with the EU average. The following tables summarize the results of the EU-ESIS survey regarding this matter.

Table E8: Number of telephone lines

	1996	1997	1998	1999	2000
Total number of conventional lines	366363	386014	404710	422037	440091
Total number of 64k ISDN lines	0	3146	9110	15938	33906
Total number of mobile phone lines	10781	91968	116429	143726	195835
Total number of lines	377144	481128	530249	581701	669832

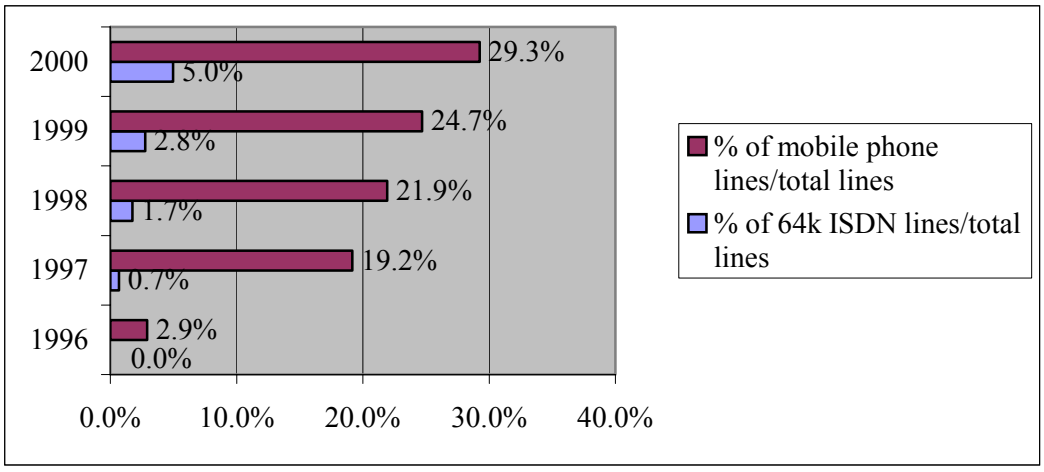
Reference: EU-ESIS and ITU

Table E9: Household telephone line penetration rates

	1996	1997	1998	1999	2000
Total number of conventional lines	56.5	59.0	61.3	62.9	64.8
Total number of 64k ISDN lines	0.0	0.5	1.4	2.4	4.9
Total number of mobile phone lines	1.7	14.1	17.6	21.4	28.8
Total number of lines	58.2	73.6	80.3	86.7	98.5
(per 100 inhabitants					

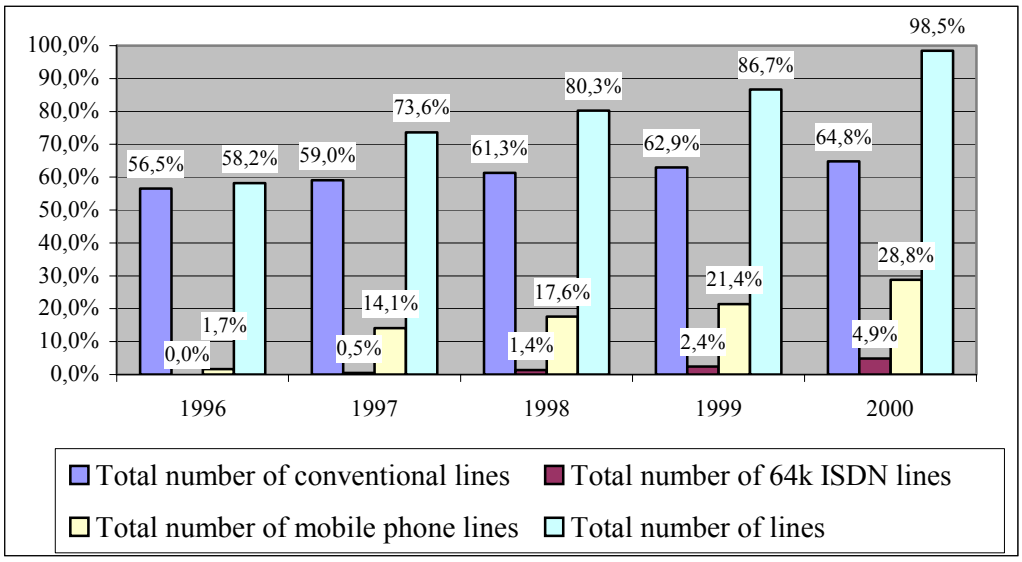
Reference: EU-ESIS and ITU

Graph E3: Percent of ISDN and Mobile phone lines compared to total



Reference: EU-ESIS

Graph E4: Fix line and mobile penetration rates



Reference: EU-ESIS and ITU

Table E10: Penetration rates for ICT tools

		1996	**1997**	**1998**	**1999**	**2000**
Telephone sets	Installed Base	444000	566000	624000	850000	n. a.
	Penetration Rate in %	68.5	86.5	94.5	126.7	n. a.
Public pay phones	Installed Base	2025	2045	2047	2250	2700
	Penetration Rate in %	3.1	3.1	3.1	3.3	4.0
Fax machines	Installed Base	1994	n. a.	n. a.	1085	n. a.
	Penetration Rate in %	3.1	n. a.	n. a.	0.2	n. a.
Modems	Installed Base	7000	n. a.	n. a.	3900	60000
	Penetration Rate in %	10.8	n. a.	n. a.	50.5	n. a.
Pagers	Installed Base	5534	4767	4038	3278	2528
	Penetration Rate in %	8.5	7.3	6.1	4.9	3.7

Reference: EU-ESIS and ITU

E.6.2. Penetration rates of PC/Internet

According to a report of the European Commission, the penetration rate of Internet in Cyprus is low.[62] This is evident in the area of eCommerce as well as Internet/PC penetration in households. The most common Internet connection on the island is through telephone lines. The pricing policy of CYTA has slowed down the development of Internet to the expected levels. Moreover, as the roll-out of ISDN lines has been slow, CYTA is providing no alternative means for people to access the Internet. On the other hand, PC penetration has increased dramatically, especially in the case of households. Education, lower prices, and availability all contributed to this positive development.

Table E11: PC penetration rates

	1998	**1999**	**2000**
Total number of home PC's	37000	64800	130600
Total number of business PC's	57000	69400	92000
Total number of PC's	94000	134200	220600
Total number of home PC's/100 inhabitant.	5.6%	9.7%	18.2%
Total number of business PC's/100 inhabitant	8.6%	10.3%	12.9%
Total number of PC's/100 inhabitant	14.2%	20%	30.6%

Reference: EU-ESIS and ITU

Table E12: Total Internet use and penetration rate

	2001	**2002**
Internet Users	120000	150000
Penetration Rate	16.8%	21,0%

Reference: ITU

[62] www.europa.eu.int/scadplus/leg/en/lvb/e21111.htm

E.7. SWOT analysis

Strengths	**Weaknesses**
geographical situation forced high interest in the use of ICT tools education system is involved in IS government agencies and municipalities using websites Penetration rates for ISDN lines and mobile phones show high growth	ICT tools and Internet used heavily mainly for promoting tourism Market liberalisation is late for fixed line and mobile phone
Opportunities	**Threats**
further improvement of penetration rates can be achieved based on previous results for next generations it will be natural to live in IS by the habit of use of ICT tools and Internet further digitalisation of public service will be easier Penetration rates for ISDN lines and mobile phones could be even higher with realised market liberalisation	Cypriot society might not discover other advantages of IS Cyprus might loose its other advantages and its chance to excel in penetration rates if market liberalisation delays.

F. INSTITUTIONAL CAPACITIES AND REGULATORY BACKGROUND

F.1. General comments

Partly due to the fact that Cyprus did not experience communism, partly due to its history (a British colony until 1960,) and partly due to its strategic location (an island connecting Asia with Europe) Cyprus developed an expanded and high-level telecom and information infrastructure. While most of the accession countries were forced to invest heavily in the telecommunications sector to catch up with Western Europe, Cyprus just continued to expand its already established network.

Nevertheless, the continuous growth in infrastructure was not accompanied by a similar movement in the legal framework governing the sector. Until 2002, the telecommunications market was a monopoly in the hands of CYTA under law. This law was passed in 1954 and continued to be used while a complete revision is pending. Some modifications were passed by the parliament in view of the increasing pressure of the EU and the harmonization standards.

One of the most important issues has been acquis. Although the EU has insisted that the telecommunications market should be opened to competition, for reasons we have already mentioned in Section B, Cyprus until very recently refused to comply. Indeed, this piece of legislation was the last major barrier to a complete harmonization with the EU. Amendments in the outdated legal framework have established acquis in 2002. The EU is standing by the side to see if a complete liberalization will be realized.

Another critical observation is the lack of legislative preparation for Internet use. Some legislation that has been prepared, which by itself is not significant in amount, is currently examined by the ministers in charge of the relevant areas. For example, the Minister of Commerce has currently in his hands a proposal to change the legal framework concerning electronic transactions in a way that would allow eCommerce to take-off. However, all decisions are pending.

Following, we present the most important points of the laws regarding telecommunications, IS, and related issues in chronological order.

F.2. Regulatory structure

F.2.1. Actors

The most important actors in the regulation of the telecommunications and IS are:

Cypriot Parliament
Ministry of Communications and Works (MCW)
Ministry of Commerce, Industry, and Tourism
Office of the Commissioner of Telecommunications and Postal Regulation (OCTPR)
Competition and Consumer Protection Service

F.2.2. Legislation

Telecommunications Service Law 302 (1954)[63]

The law postulates that the telephone market and related infrastructure are a state monopoly. CYTA is created as an organization to fulfil this goal. Section 3 of this Law notes the following regarding CYTA:

> 'a corporate body with perpetual succession and a common seal and with power to acquire, hold, and dispose of property, to enter into contracts, to sue and to be sued in its said name and to do all things necessary for the purpose of this Law.'

This Law is administered by the Ministry of Communications and Works and the Ministry of Commerce, Industry, and Tourism controls the liberalized part. There is no provision for an independent regulating authority. An independent office was established in 2002 under the Office of the Commissioner of Telecommunications and Postal Regulation.

The role that the Law bestows to CYTA includes the following:

- duty to operate good and sufficient telecom services in Cyprus
- install and operate all infrastructure
- promote the development of telecom services
- make regulations governing these services
- advise the Minister in all related matters

One of the biggest obstacles to the liberalization of the market is exactly the power of CYTA to not only administer but also regulate (last two tasks) the market. More on this subject will be presented later.

Finally, the Law prescribes CYTA to:

> 'provide a telecommunications service and the necessary installations and plant for use by any people ("the subscriber,") in any place of the Republic, to enable the subscriber to communicate by the telecommunications service with any other person.'

Regarding the Protection of Competition Law 207 (1989)

The Competition and Consumer Protection Service was established in 1989 as part of the MCIT and became independent in 1999. This office was established to safeguard competitive market conditions in all sectors of the economy. Article 2 of the Law gives power to CCPS to intervene on its own in case when it recognizes an obvious breach of competitive practices. While it has issued many decisions and verdicts concerning different industries, probably the most important one was issued against CYTA in 2002 for anti-competitive policies and abuse of market power.

Article 6 forbids the abuse of power of a dominant company in the market. Accordingly, the following are stipulated as abuse of power:

- implicit or explicit set of unfair prices or the sale of unfair products

[63] Following the analysis given by Cullen International SA and Wissenschaftliches Institut für Kommunikationsdienste Gmbh in a report presented to the European Commission in 2001.

- the decrease of production or of technological innovation that damage the interests of consumers
- the use of contradictory rules for similar transactions that puts competitors in a disadvantageous position
- coercing the inclusion of additional clauses in a contract that are contradictory or irrelevant to the concrete interests of the contracting party and are not related to the contract itself

Regarding Radio and TV Station Law 7 (1) 1998

While the radio and TV sector was fully liberalized between 1990 and 1992 with different regulations or laws, the comprehensive Law that administers the sector was introduced in 1998. There, specific requirements were set for the establishment and operation of radio and TV stations. The regulatory agency that oversees these developments is the 'Authority of Radio-Television of Cyprus.' Applicants for a license have to fulfil basic obligation regarding infrastructure, quality of programming, complaints, and advertisements. Finally, there have been discussions about the impact of digital television on this legislation and the actions needed to make it up-to-date.

Regarding Market Concentration Law 22 (1) (1999)

The Law regarding the Protection of Competition was revised in 1999 to include the concentration of market power to one party due to a merger. Moreover, the clause concerning the abuse of dominant position was amended to include the relationships between consumers, suppliers, producers, representatives, and commercial partners. In these cases, abuse of power refers to the employment of unfair rules in transactions, the use of selective behaviour vis a vis commercial partners, and the interruption or discontinuation of an established commercial relationship.

Regarding the Commissioner of Telecommunications and Postal Regulation 19 (1) 2002

Doubtless, this is the most important recent development in the telecommunications sector of Cyprus. The introduction of this office is thought to accelerate the liberalization of the telecom market and guarantee its function under competitive, open market conditions. The regulation was conceived and formulated to comply with EU harmonization standards with the main purpose to encourage healthy and fair competition of the market. Its goals are the promotion and protection of consumer interests in the area of telecommunications and postal services in terms of price, quality, and extent of services.

The Law stipulates the independence of the Commissioner from political connections. The government nominates a candidate and his/her candidature is debated between the government and the parliament, which have to reach a consensus before a candidate can assume her office. The goal of this provision is to secure and protect the Office's transparency, an equal opportunity policy, the objectivity of the Commissioner, and fairness.

Article 3 lays down OCTPR's assignments:

- to make licenses available for the delivery of services in the areas of telecommunications and the operation of public telecommunications networks and postal services

- to monitor and regulate the proper use of related laws and regulations
- to maintain a list of companies active in the sector
- to set price ranges
- to decide on matters of connectivity
- to collect and arbitrate complaints
- to approve the purchase or use of equipment
- to communicate and arbitrate among the interest parties in transactions connected to the telecom market.

The Commissioner can use the following means to pursue its policy:

- issuing regulations that are approved by the ministerial cabinet and are forwarded to the parliament for approval
- issuing memoranda that are published in the Cypriot State Newspaper
- issuing decrees in accordance with the Law regarding the Commissioner of Telecommunications and Postal Regulation that are published in the Cypriot State Newspaper
- making announcements to the press

Finally, article 19 defines the responsibilities of the Commissioner, which even according to the law are broad and complicated. The most important ones are:

- to advice the Minister regarding telecommunications and postal services issues
- to set and publish the standards of service quality in these sectors
- to carry out the general policy strategy set out by the Minister
- to set the rules for competition regarding telecommunications services licenses
- to provide licenses to companies that successfully participate in the bidding process
- to ensure the compliance of all companies to the rules set by the OCTPR
- to revoke a license in case a company does not follow the rules set by OCTPR

Different regulations enacted by the OCTPR (2002-3)

Since its inception, the OCTPR has issued a number of regulations that already have set the tone in the telecom market. Everyone is aware, including CYTA that has since adjusted its policies and prices, that full liberalization is imminent. The most important of OCTPR regulations are:

- regarding the quality of telecommunications services according to the EU directive 98/10/EK
- regarding public hearings in the case of disputes
- regarding the rules regulating public auctions
- regarding the harmonization of administrative costs, using EU directive 97/13/EK as guidance
- regarding the harmonization of procedures in calculating the link-up costs according to EU directive 97/33/EK

It is obvious that the main goal of this office in the first days of its foundation was to first, fulfil the most urgent harmonization needs of the sector and second, to set the stage for a second license bidding.

F.3. Liberalization

As we have repeatedly noted, until very recently the market for telecommunications in Cyprus was monopolistic. The following table gives the reader an overview of the situation in 2002:

Table F1: Status of telecommunication services in Cyprus in 2002

Category of Service	**Status**
Infrastructure	
Public telecommunications networks	State monopoly
Local networks for voice telephony	Under liberalization
Leased lines	State monopoly
Alternative Infrastructure	State monopoly
Broadcasting/Pay TV	Liberalized
Cable	Non-existent
Voice Telephony	
Local Calls	State monopoly
Domestic long distance calls	State monopoly
International Calls	State monopoly
Voice Services to closed user groups	Under liberalization
Mobile Communications	
Analogue	Under liberalization
GSM Digital	Under liberalization
DCS 1800	Under liberalization
Paging	State monopoly
Satellite Communications	State monopoly
Other Services	
Data Transmission	Liberalized
Value added services	Liberalized
Internet services	Liberalized
Equipment provision	Liberalized

Reference: We used current information from the Cypriot government's web-site, the aforementioned report to the European Commission, and information from EU-ESIS programme (2001) for the creation of this table.

The liberalization of the telecommunications market is not an easy task for reasons we noted before. However, the OCTPR has already taken bold steps towards that direction. The first important decision right after its inception was to announce the competition for a second mobile phone operator license. There were quite a few interest parties when the announcement was made in September 2002 like Greece's OTE and a Russian consortium of companies. Even CYTA and EAC showed interest but their offers were turned down immediately. However, due to the delay of the proceeding and the hard global economic climate, especially in the telecom sector, interest has decreased. On 10 July 2003, MCW

announced the auction yet again in search of an acceptable offer.[64] It is very important to note that the Cypriot government recognizes CYTA's advantage in the sector and made provisions in the bidding documents regarding fair competition environment according to EU standards.

Another significant current development was the decision of the Competition Office to fine CYTA for 20 million Cypriot Pounds for anti-competitive behaviour.[65] Employing article 22 of Law 207/89, CCPS initiated an examination of CYTA's pricing policies under suspicion of violation of article 6 concerning abuse of dominant market position.

This proceeding was influential for two reasons: first, it investigated CYTA's position in the telecommunications market and second, it established its authority to investigate such cases within its jurisdiction. CCPS examined CYTA's annual report of 2002 in view of the 1998-2001 financial results. According to CCPS, CYTA had a compound increase of profit of 85% for the years 1998-2002. International and mobile phone calls generated the bulk of the profits (82.4%) By definition monopolistic markets, CYTA continued its pricing policy concerning international and mobile telephony despite the fact that its profits were increasing drastically. Compared to other similar telecom organizations (Greek ones like OTE, DEH, and DEPA) for the same period of time, it was found that CYTA was by far the most profitable.

CYTA defence strategy was to deny CCPS's authority on the matter, citing that the Supreme Court of Cyprus is responsible for any infringement of law in the sector. It claimed that since the Supreme Court did not invoke the proceedings, they were void. Furthermore, according to the outdated Law of 1954, in addition to having operating power in the telecom market, it has regulatory authority. This authority is granted by the parliament that indirectly, through the MCW, controls CYTA. Thus, the parliament is responsible for setting its prices. Accordingly, the excessive profits experienced in 1998-2002 are not results of CYTA's policies but rather a consequence of the policy designed by the government.

CCPS' verdict was that CYTA did infringe section 6(a) of the Law 207(89) and imposed a fine of 20 million Cypriot Pounds (EUR 34 million). In addition, it instructed CYTA to change its pricing policies until January 2003. In case that CYTA failed to do so, it imposed a fine of 5 000 Pounds (EUR 8,650) per day of delay. This decision was a shock to CYTA and led to changes in the operation of the organization. It showed that monopolistic practices were unacceptable and a competitive future was awaiting the company. Since then it has sliced its prices and bulked up its services in view of the liberalization of the market.

F.4. Tariffs[66]

Since the telecommunications market was until recently a monopoly and prices were implicitly set by the government, we include a presentation and discussion of tariffs in the present chapter. The following tables provide an overview of the rates in different services offered by CYTA.

[64] The document is called 'MCW/OCTPR 1/2003' and is available in MCW's web-site.
[65] All related documents are available at CCPS's web-site: www.competition.org.cy
[66] Cullen International SA and Wissenschaftliches Institut für Kommunikationsdienste Gmbh analysis.

Table F2: Voice telephony tariffs in EUR, in 2000

Voice Telephony (in EUR)	
Monthly Access Charge	2.8700
Installation	24.2700
Connection	24.2700
Monthly Rental	2.1700
Local Call (per min)	0.0056
Domestic Call (longest distance) (per min)	0.0537
International neighbouring country (per min)	0.3467
International Belgium (per min)	0,5201
International USA (per min)	0.6934
International Basket (per min)	0.4200

Table F3: Mobile telephony tariffs in EUR, in2000

Mobile Telephony (in EUR)	
Connection Fee	43.8400
Monthly Rental	17.5400
National Calls (lowest)	0.0719
National Calls (highest) (per min)	0.1000
International Calls Belgium (per min)	0.4349
International Calls USA (per min)	0.6314
International Calls Basket (per min)	0.8067

This data reflects prices in 2000. We have noted that since then CYTA has cut prices. In mobile telecommunications, it started to offer three different packages, of low medium, and high use since September 2001. International call prices were readjusted in February 2002, with the highest decrease being 25 %. In addition, in September 2002 it slashed prices for international calls, putting forward decreased rates between 40-78 %, and reduced the mobile phone tariffs by 12-33 % for the different packages it offers.[67] On the other hand, CYTA has increased prices for local and domestic calls. Although the plan was not realized to its full extent as announced in November 2001 due to political pressure, rates did increase significantly. The overall strategy of the organization was to diminish the dependence on international and mobile phone calls for its profitability (84 %) as noted before, having in mind the imminent liberalization of the market and the potential inflow of competitors. However, this strategy hampered the development of Internet use on the island and offset the positive development of the ISDN rate decrease introduced in 2001. The results talk for themselves: while ISDN use increased, overall Internet use remains low.

The data available shows that even before the decrease, compared to the rest of the accession countries, CYTA offered significantly better prices and more services. One has to keep in mind that Cyprus, far more advanced than them, is trying to reach the EU average. Therefore, its goals are to be internationally competitive, even in terms of EU rates. Thus, the latest developments are viewed as positive steps towards that direction.

[67] Information from CYTA's press releases web-site: www.cyta.com/pr/pressreleases

F.5. Conclusion

The high level of telecom infrastructure in Cyprus was not accompanied by a similarly advance level of legislation regarding the sector until recently. For example, the outdated Law of 1954 is still in use. However, Cyprus has taken the right measures to ensure acquis and harmonization to EU standards. The process of harmonization started already in 1984 while the establishment of acquis is a recent development. The telecom market will be soon fully liberalized. A second license for a mobile operator is auctioned. Nevertheless, parts of the sector are still under state monopoly and there are no plans for change.

Politicians have long been avoiding the introduction of any law that would hurt the interest of CYTA. This is due to the fact that the government and CYTA are closely related. CYTA has grown for the last 40 years as a monopoly supported by the state. By now, it has formed a strong bureaucracy and an interest group of its own that pressures the government. It is controlled by the parliament, which granted CYTA regulatory authority. The dealings between the parliament and CYTA in terms of policy making have been murky and the pricing policies in the past had an adverse effect for Cypriot businesses and individual consumers. The people in charge of CYTA and politicians are part of the same elite and know each other. As competition would hurt these interests, Cypriot governments avoided bringing up the subject of reform. While still resisting, politicians have lately shown some compliance to initiate, albeit gradually, changes to satisfy the EU.

The EU has been insisting on legal changes in view of the fact that the increased competition and market openness would lower prices and improve the quality of services. Foreign interest has been high to enter the Cypriot telecom marker, and the Cypriot government is looking to attract foreign direct investment, and its goal is to establish Cyprus as an international service centre. In the past, the lack of a proper legal framework was a hindrance to these goals and to the expansion of different areas of IS as it is evident in the case of Internet usage. As soon as they are in place, these new regulations should assist the government in attaining its objectives and provide Cypriot consumers a multitude of advantages.

As the reader must have noticed, we did not discuss any legal developments regarding the Internet. This is due to the fact that all legislation is currently examined and is pending approval of the related ministers to be forwarded to the parliament for discussion. However, this provides a timely possibility for the government to introduce reforms that are in accordance with most advanced international standards.

According to the Country Report of the European Commission “In the field of telecommunications, Cyprus’ framework legislation is now in line with the *acquis* adopted in the period 1998 to 2000. The major parts of the implementing legislation have been adopted. The 2002 *acquis* remains to be transposed and implemented. Several general authorisations and licences have been issued for data and Very Small Aperture Terminals (VSAT) services as well as the licence for the provision of leased lines by an alternative network provider. In order to develop further competition in the market, cost oriented rates for international leased lines have to be introduced, local loop unbundling needs to be implemented and the price re-balancing process has to be finalised. The second licence for mobile telephony has recently been issued with the objective to start the operation of the network before the end of this year. The administrative capacity in this sector has been strengthened, by completing the recruitment of the staff of the Office of the Commissioner of Telecommunications and Postal Regulation; its effectiveness in implementing fair competition needs to be ensured.

In the area of postal services, Cyprus' legislative alignment remains to be completed in particular as regards the license regime, accounting systems for universal services, market authorisations, administrative charges and quality of services. The 2002 *acquis* remains to be implemented."

In general, Cyprus is well-positioned to take advantage of its advanced infrastructure. However, the regulatory environment is a problem that needs to be soon dealt with. This is the opposite of what is happening in other accession countries, where legal reforms are in place despite the lack of funds going into telecommunications and IS.

F.6. SWOT analysis

Strengths	**Weaknesses**
majority of sector in process or already liberalized willingness of regulators to follow EU harmonization standards EU standards are used as guidance for all reforms	old Law of 1954 needs to be fully revised absence of regulation regarding Internet some parts of the marker still under state control limited transparency in decision-making compromises between business and politicians hinder reform
Opportunities	**Threats**
low prices, higher quality if all areas are opened to competition establish transparency in all administrative and legislative dealings use of the most advanced legal framework to regulate Internet use	backward development of the sector due to slow reform since politicians are unwilling to hurt specific interests murky/ambiguous dealings will hurt the competitiveness of the sector monopolistic practices will continue to prevail in the sector

G. EDUCATIONAL SECTOR, LABOUR FORCE SUPPLY AND TRAINING IN IST - RELATED SUBJECTS

G.1. The Cypriot educational structure

The Greek Cypriot education is administered by the Ministry of Education.
Six years of elementary education and six years of secondary school are provided; attendance is required between ages of 5 and 15, which is the lowest of all European countries.

Graph G1: The Cypriot education system in 2003

<table>
<tr><td colspan="2">Postgraduate students</td><td>Cyprus International Institute of Management</td><td></td><td></td></tr>
<tr><td colspan="3">State Tertiary Education
University of Cyprus (18-22)</td><td>Non-University Public Tertiary Educaion, Adult education</td><td>Non-University Private Schools of Higher Education</td><td>21
20
19
18</td></tr>
<tr><td>The Lyceum (LEM)</td><td colspan="2">Comprehensive Lyceum (Eniaio Lykeio)</td><td>Technical and vocational school</td><td>Private Secondary Schools</td><td>17
16
15</td></tr>
<tr><td colspan="3">State Lower Secondary (Gymnasio)</td><td colspan="2">Private secondary schools</td><td>14
13
12</td></tr>
<tr><td colspan="3">State primary education
(Dimiotiko scholio)</td><td colspan="2">Private Primary Schools</td><td>11
10
9
8
7
6</td></tr>
<tr><td colspan="5">State and Community pre-primary education</td><td>5
4
3</td></tr>
</table>

G.1.1. Pre-school education

There is a well-established pre-primary education system with state kindergarten institutions as well as private pre-schools. Attendance is not compulsory.

G.1.2. Basic level – primary school and gymnasium cycle

The basic level lasts for 9 years and comprises primary education. It constitutes the primary school (Dimiotiko scholio), of 6 years duration, and the lower secondary level, taking place in the Gymnasium, of 3 years duration. Education at this level is compulsory, requiring no entrance admissions and is free of charge. A small number of private primary schools charge fees and cater foreign nationals and Cypriots who opt for a particular foreign language. The Gymnasium offers all pupils a basic general education. Specifically the main educational objectives at gymnasium level are to enable pupils to broaden their traditional value system.

G.1.3. Public upper secondary level – lykeio and technical cycle

Upper secondary education lasts for 3 years, for students at the ages from 15 to 18. Education at this level is free in public institutions.

The Lykeio Cycle comprises two types of schools:

- General Lykeio (Lykeion Epilogis Mathimation, LEM) and the Eniaio Lykeio,
- Technical and Vocational Schools.

G.1.4. Reforms in lykeion

The phasing out of LEM schools started from the school year 2000/2001, as it was decided that the General Lykeio would be gradually replaced by Comprehensive Lyceum. (Eniaio Lykeio).

The Eniaio Lykeio is a comprehensive Upper Secondary School with the aim of meeting growing demands for mobility and flexibility where the emphasis is on learning mechanisms, research, knowledge of foreign languages, exploitation of the *new information technology*, and preparation for life-long learning.

First at the lykeio level, students can learn about informatics only if they choose to, as a subject of specialisation. Hence it is not compulsory, the pupil can choose it according to his wishes and interests.

G.1.5. Reforms in TVE

Secondary Technical and Vocational Education (TVE) is offered to students who graduate from the Gymnasium.

As from the school year 2001-2002 the technical upper secondary cycle has been undergoing a major reform, the technical schools curriculum concentrates on general education subjects with technical subjects, giving emphasis to the acquisition of general skills and abilities and it is enriched with new topics that reflect new technological trends and the emerging need of the Cyprus economy.

All secondary institutions offer the same type of school leaving certificate, the Apolytirio, which is a qualification for employment in clerical positions and provides access to local and overseas tertiary education establishments.

G.1.6. Private secondary schools

The majority of private secondary schools are registered with the Ministry of Education and Culture.

Curriculum programmes for most private secondary schools extend over a seven year period, with the emphasis on general education for the first three years. Foreign language schools have six or seven year programmes with English, French, Italian or Arabic. A few private secondary schools are attached to primary schools providing an integrated twelve- or thirteen-year programme. There are no entrance examinations except in certain foreign language schools.

G.1.7. The tertiary level

The tertiary level comprises several institutes of higher education, and since 1989 the University of Cyprus.

There are 8 public tertiary institutions. Of these, 7 offer programmes at the sub-degree level (college) and one offers a post graduate diploma programme in the area of management for university graduates.

There are about 27 private tertiary education institutions in various fields of study offering programmes between one to four years. As yet not all the programmes offered have been accredited by the Council for Educational Accreditation.

The University of Cyprus was established in 1989 and admitted its first students in 1992. Admission to the University is highly competitive: applicants must have successfully completed a six-year secondary education and passed the entrance examination. Education at University is free for Cypriot students, provided the students successfully complete their studies each semester.

The Cyprus International Institute of Management (CIIM) began its operation in January 1991. This is a private non-profit organization founded by leading local public and private institutions. The primary aim of CIIM is to train and provide Cyprus with skilled managers. The main programmes provided are the MBA (Master in Business Administration) and the MPSM (Master in Public Sector Management). Both programmes last for two years. Nearly all trainees are sponsored by their employers or are employers themselves.

G.2. Achievements and trends in secondary and tertiary education

According to data provided by the Ministry of Education and Culture, in 1999/2000 there were 163, 654 full-time students and 12, 275 teachers giving a pupil/teacher ratio of 12, which is above the average of EU countries. However, this can be correlated with the fact that the school expectancy in Cyprus is the lowest (13 years) both among the candidates and in the EU (EU-average: 16 years).

The distribution of the pupils/students at different levels of education is as follows. Special education 0.2%, pre-primary education 16%, primary education 3.9%, secondary education 3.5%, and at third level 0.4% only, compared to the average percentage of tertiary students in the EU, accounting for 15% in 1999/2000.

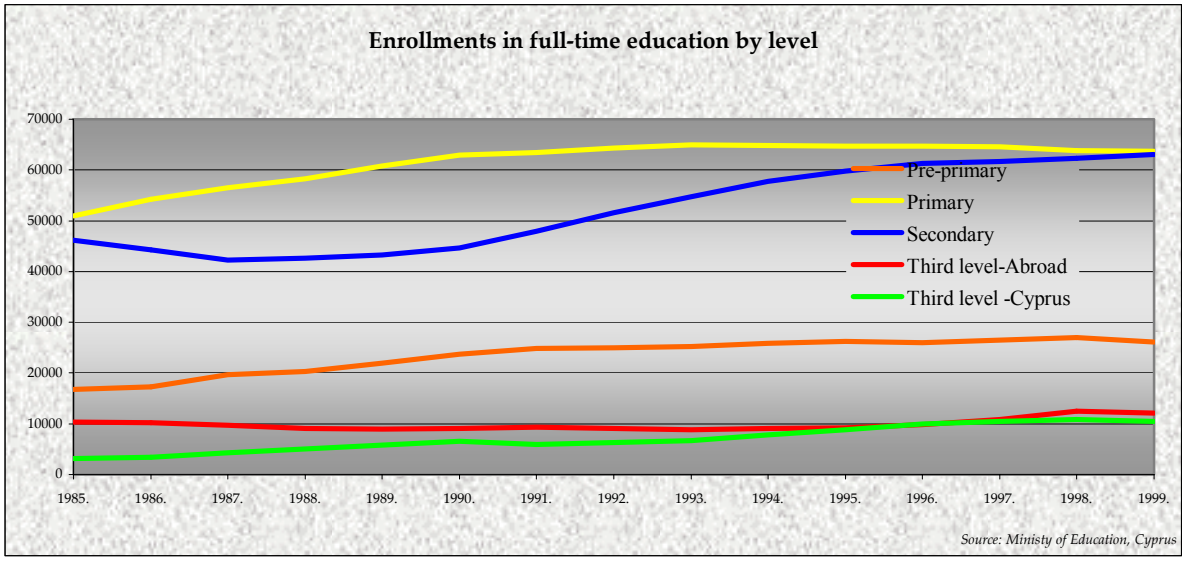
The gross enrolment ratio in the academic year 1999/2000, for age between 6 and 23 in primary school was 96%, in the secondary education 92%, and in the tertiary education in Cyprus, 21%. Cypriot students abroad summed up to 12,147 (24%). 91% of them attended degree programmes and 9% sub-degree programmes. The main countries of destination for tertiary students abroad were Greece, the United Kingdom and the USA. The most popular fields of studies were Business Administration (14%), Social and Behavioural Sciences (12%), Humanities (11%), Health (10%), Engineering (8%). Only 4% of students studying abroad chose computer sciences during the academic year 1996/1997.

Completion rates at secondary level are relatively high. In the school year 1999/1998, 86% of pupils enrolled three years earlier, successfully completed the lower secondary cycle; and about 80% of the pupils that first enrolled at secondary level education six years earlier, graduated from the upper secondary cycle.

According to the data of the Statistical Service, in academic year 1999/2000, 69% of those leaving upper secondary school – or app. 55% of all young people in the relevant age-cohort – continued their studies beyond the secondary level.

About 40% of those who continued their studies beyond the secondary level attended higher education in Cyprus, and the remainder attended higher educational institutions abroad. 25% of the tertiary students in Cyprus followed degree programmes, and 75% sub-degree programmes. The number of graduates in mathematics, science and technology per 1000 from the population between 20 and 29 was fairly below the EU-average in the years 1998, 1999 and 2000. (9.0; 4.0; 3.3%)

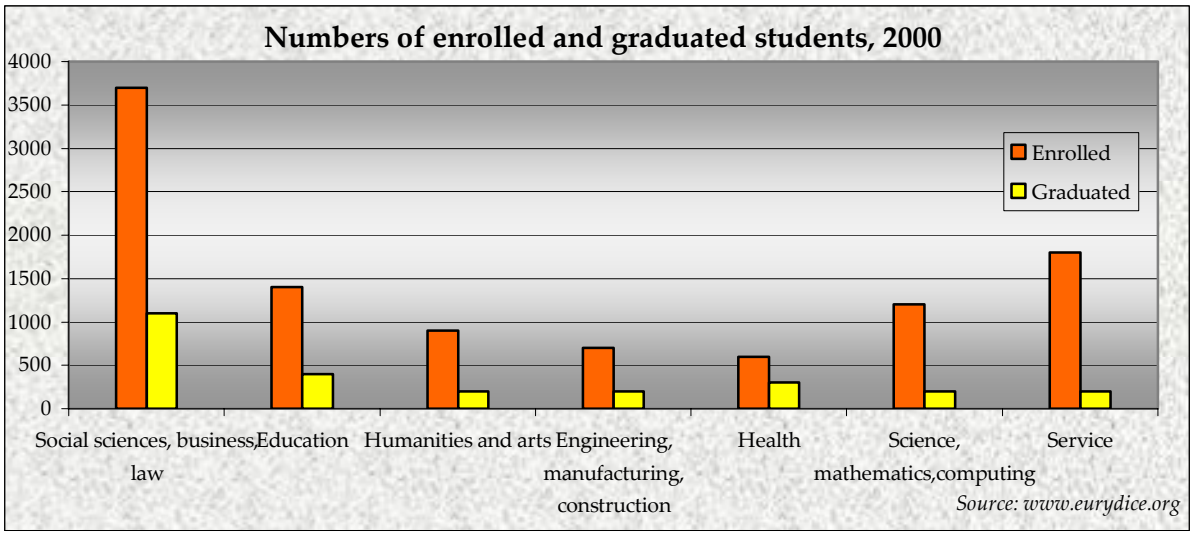
Graph G2: Trends of enrolments in full-time education by level



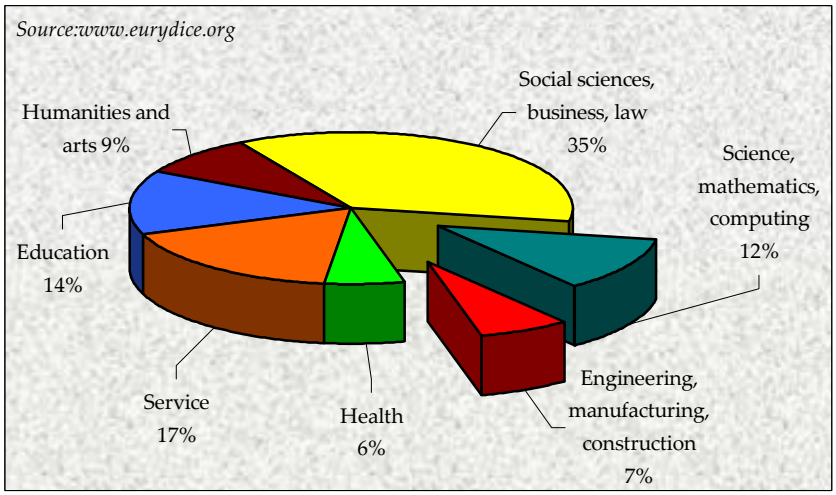
As it can be seen in Graph G2, the enrolments in pre-primary and primary education have been growing in line with population growth. The number of pupils in secondary education has been increasing dynamically from the year 1987. The main difference in the case of Cyprus compared to other European countries lies in the number of enrolled students in the field of tertiary education. The proportion of tertiary students (20%) is rather low, the ratio of students studying abroad – 54% of the total number of tertiary students – is high compared to the EU-average. That is why the percentage of 18 year olds who are not in the national system is the highest in Cyprus (70%).

The number of enrolled and graduated students in 2000 can be seen in Graph G3. The highest level of both the enrolled and the graduated came from the field of "Social sciences, business and law", following the recent European trend. Together the "Engineering, manufacturing, construction" and "Science, mathematics, computing" (the fields where ICT-related degrees are awarded) constituted the second most favoured field of tertiary students. The field of "Services" played a remarkable role, thanks to the lively tourism.

Graph G3: Number of enrolled and graduated students



Graph G4: Distribution of enrolled students among fields of studies, 2000



The proportion of enrolled tertiary level students in "Science, mathematics and computing" and "Engineering, manufacturing and construction" was 19% in 2000. This figure is sharply lower than the EU-average (27.1%).

Only 4% of the people aged 20-29 graduated in "Science and technology" between 1993 and 2000 compared to the EU-average, accounting for 9.7%.

There is no significant difference between the proportions of the enrolled and the graduated students. The field of "Social sciences, business and law" seemed to be a bit less popular, as the proportion of the enrolled was lower by 7%, while the number of enrolled students grew in the field of "Services" and, "Science, mathematics and computing" by 10% and 4% respectively.

G.3. Public expenditure on education

Public expenditure on education has been increasing dynamically as can be seen in Graph G5. Public expenditure on all levels of education amounted in 2001 to EUR 57.97 million and accounted for 1.5% of the Government budget. This proportion was the highest among all European countries compared to the two highest values of 1.5% in Iceland and Denmark. The first dominant growth occurred in 1989 when the University of Cyprus was established. Analysing the number of enrolment, we can see a 38% growth between 1985 and 2001. It means that between 1985 and 2001 the public funding increased from 0.8% to 5.7% as a percentage of GDP.

The distribution of public funding to educational institutions by level of education shaped as follows in 1999. The primary level accounted for 38%, the secondary level of education for 51.7% and the tertiary level for 0.6% only, which was in European comparison the lowest achievement. However, it must be mentioned that the total expenditure budget, as a share of total expenditure, was the highest among the European countries.

The distribution of specific budget between the purchase of equipment and expenditure on human resources was 62.5% and 37.5% during 2000/2001.

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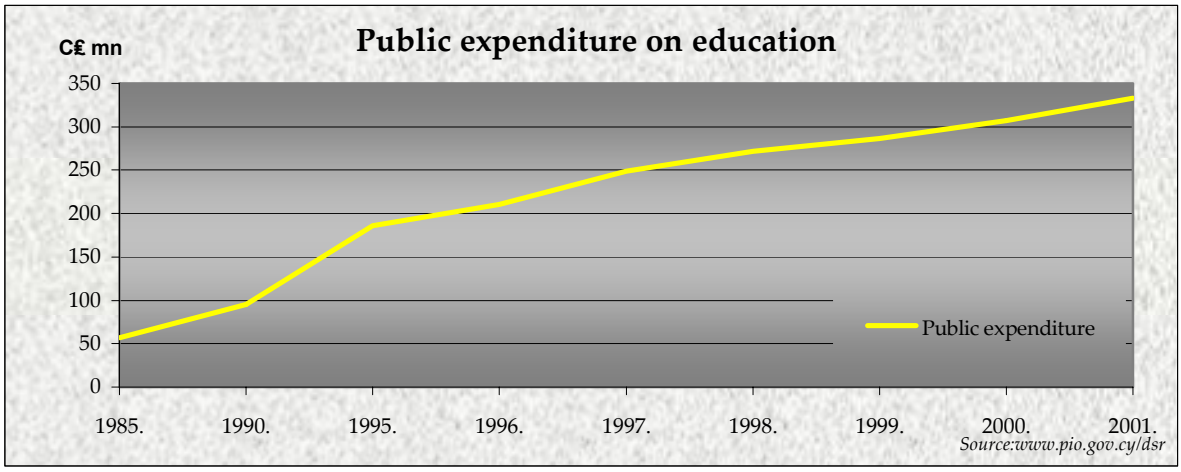
Graph G5: Public expenditure on education between 1985 and 2001



G.4. Reforms

The process of establishing the University of Applied Sciences and Arts is under way. The University will include non-university public third level institutions. The establishment of the Open University is also under serious consideration.

The Government of Cyprus has a three-year (1999-2003) Master Plan called "Orama" (Vision) for the introduction of ICT and Computer Science in secondary education. The ultimate goal of the plan is to produce computer literate students. It also aims to provide one PC per student, that PC being either at home or at school.

Cyprus has made progress in reforming its education and training system. Information technology was introduced in all primary schools and as a separate subject across the curriculum in all lower secondary schools.

G.5. ICT-related education

G.5.1. Secondary education

ICT Courses

In public education, all lyceum students (aged 15-18) take a computer course at the 1st grade of the lyceum, and about 30% take it as an elective course at the 2nd and 3rd grades. All 3rd grade gymnasium students (ages 12-15) are currently taking a computer course. During the previous academic years (2002-2003) a computer course was introduced to all 2nd graders, and the year after to all 1st graders.

It is worth mentioning that the subject of Information technology was introduced in upper secondary general education as well as in secondary technical and vocational education since 1984.

In private secondary schools, the students in 28% of the schools take computer courses at all grades. The remaining students in the 72% of private schools take compulsory computer courses, mainly at lower grades.

ICT Curriculum

The ICT curriculum taught in public secondary education includes all aspects of Computer Science, from familiarisation with PC components, to Operating Systems. The thought application are for example Word Processing, Programming Languages, Use of the Internet and Creation of Websites, and Basic System Analysis concepts. The curriculum does not aim at familiarising students with particular applications, such as Microsoft Word for example, but to give the proper knowledge that will allow students to apply it in any environment.

The ICT curriculum taught in the private secondary education includes introduction to computer science, familiarity with operating systems, introduction to software packages, like word processing, spreadsheets and databases, programming languages, like Visual Basic, C, Pascal, and Internet, like browsing, e-mail and ftp.

G.5.2. Higher education

ICT Courses

In public higher education institutions, a percentage of 33% vs. 36% in the corresponding private education institutions introduce Computers and Information technology by integrating them with the courses that are taught traditionally. The integration is done by using the Internet for information gathering and using word processing for homework. The remaining 67% of public and 64% of private institutions have introductory computer courses for all students. Additionally in private education the remainder 36% of institutions that do not offer introductory computer courses offer instead a computer related courses.

ICT Curriculum

The ICT curriculum taught in the public higher education institutions includes introduction to computer architecture, familiarity with operating systems, and introduction to software packages, like word processing, spreadsheets and presentations.

The ICT curriculum taught in the University of Cyprus includes an introduction to computer science in the non-computer related departments, such as introduction to operating systems, software packages, like word processing, spreadsheets, presentations and Internet familiarity, like browsing, and e-mail. The Department of Computer Science offers courses like Programming Languages (C, C++, Java), Databases, Computer Architecture, Computer Networks, Software Engineering and ECommerce.

The ICT curriculum taught in private Institutes and Colleges includes introduction to computers, familiarity to operating systems, introduction to software packages, like word processing, spreadsheets, and Internet familiarity like browsing, and e-mail. The ICT curriculum taught in computer related courses includes all aspects of computing, including programming languages, Databases, Computer Architecture, Software Engineering and Computer Networks.

G.5.3. Employment and mobility of recently trained

The problem of unemployment and underemployment of tertiary education graduates has been, to a certain extent, alleviated during the last few years. The average number of tertiary education graduates who were registered as unemployed in 1999 was 2,109 people or 18.5% of total unemployment.

Of the total number of unemployed graduates of higher education in 1999, 7.8% were unemployed up to six months, 1.3% were unemployed for six to twelve months and 0.9% were unemployed for more than twelve months.

Imbalances have emerged in ICT-related occupations. The transition towards a knowledge based economy and the diffusion of ICTs have generated employment opportunities for computer systems designers and analysts as well as computer programmers, resulting in skill shortages that have mainly been offset through the temporary employment of foreign labour. Foreigners represented, in the year 2000, 40% of the gainfully employed population in these occupations, the vast majority being employed at international business companies producing products and providing services for the international market. Companies operating in this

sector are allowed to employ their own overseas managerial/professional staff. The presence of a large number of foreign workers in this category, therefore, is not due to internal market imbalances.

G.6. Tertiary sector and research performance – in IST-related subjects

Expenditure in research and development is lower than in the EU. It is also the lowest among the candidate countries. The total R&D expenditure accounted for EUR 27.44 million in Cyprus in 2001, from which 26.1% was performed by the higher education. Total R&D expenditure has increased slightly since the beginning of the 1990's, reaching 0.27% of GDP in 2001. The average in total R&D expenditure for the 15 members of the EU was equivalent to 1.94% of GDP. Similarly, this was in the candidate countries over 1%.

A positive development has been the increase of the R&D budget in the field of Engineering and Technology, in which the ICT sector is included. EUR 2.43 million (0.8% of the total R&D expenditure) was devoted to the Engineering and Technology sector in 2001. Although this increase is greater than the equivalent in agricultural sciences, it is dwarfed when compared to the increase of R&D expenditure in natural sciences, which more than quadrupled from the beginning to the end of the previous decade.

Most of the R&D funding comes from the government sector. However, towards the end of the 1990s a significant increase in alternative sources of funding was witnessed, especially from the private sector.

The number of full-time employees in R&D sectors has also increased to 690. The most important employer in the R&D sector has been the government (employing 354 people). Towards the end of the 1990s there was a large increase in R&D employment in private enterprises and higher education. The number of full-time personnel employed by the business sector grew from 47 at the beginning of the decade to 144 by the end. In higher education this increase went from 2 to also 144.

G.7. Issues of technological transfer and innovation, attractiveness of academia for FDI

The strengths of innovation performance in Cyprus lie in the current tertiary education and in home Internet access. As the percentage of population with tertiary level education account for 26.8%, which is more than 20% higher than the EU-average (21.2%), while the proportion of home Internet access is the best among the candidate countries, namely 22.1% of the population. But at present there is no candidate country that reaches the EU-average. That is why this performance proves only low compared to the EU.

The weaknesses lie in the current medium-high, and high-tech manufacturing employment, the Business R&D expenditure, and the trends in FDI. The share of employment from the total workforce is 1%, the business R&D expenditure is 0.05%; both are the poorest performances among the candidates. The employment in high-tech services (1.8% of total workforce), the proportion of life-long learning (3.1% of 25-64 years age class), the public R&D expenses (0.2% of GDP) and the inward FDI stock (23.7% of GDP) prove all low performances, compared both to the EU-average but even to the candidate countries. Due to the poor R&D performance the high-tech exports remained below 5% of total manufacturing exports, which is one of the lowest among the candidate countries.

Current government policy referring to the increase of the high-tech FDI is encapsulated in the "New Strategic Development Plan" covering the period 1999-2003 adopted by the Council of Ministers. The main focus of the plan is on promoting a restructuring of Cypriot industry and a diversification toward information technologies.

Two main objectives influence indirectly the field of innovation policy: the first being to increase GERD (Total R&D expenditures) from 0.36% of GDP to 0.5%; the second being related to the information society and the aim to transform Cyprus into an international IT centre. Five of the New Industrial Policy's (1999) chapters can be considered as directly or indirectly addressing the issue of innovation, namely the support for new business incubators (with an emphasis on high-technology firms); the establishment of a Research, Technology and Development Centre for applied research in areas of special interest, industrial testing and metrology, subsidies for specialised software in industry; and incentives for upgrading and introducing new technologies in industry.

The main focus of Government policy is directed at attracting FDI, increasing competitiveness and boosting the currently low levels of public and business R&D on the island, although there is a conflict between the aim to increase funding levels for R&D and innovation versus budgetary constraints.

Increasing importance is placed on developing Cyprus as an international IT centre and hence on integrating ICTs and promoting information society developments.

G.8: SWOT analysis

Strengths	**Opportunities**
Strong growth of tertiary sector, High level of education of the population.	Several training action financed by the Human Resources Development Authorities, Develop strategies oriented to new products or new services, Envisage incentives for R&D and innovation in firms, Develop statistics and indicators to monitor innovation, Slow increase in FDI
Weaknesses	**Threats**
Skilled labour shortages, Weak vocational training structures, Very low R&D capacity, Lack of an open and sufficiently competitive environment for science and research, Low level of technological development in manufacturing, No financial incentives for R&D.	Isolation from R&D networks in EU, Fragmented innovation system: lack of industry-science relationships.

H. NATIONAL AND REGIONAL DEMOGRAPHIC DATA AND PROSPECTIVE

H.1. Main demographic characteristics:

On 1 January 2003 the total population of Cyprus was 767,314. This made it the country with one of the smallest populations in the world, ranking 159th. But this figure does not include over 115,000 Turkish settlers illegally residing in he Turkish-occupied part of Cyprus.

A year earlier, the total population of Cyprus had been 762, 887 and by the end of this year it is expected to grow to 775,927. The density of the population is 82.96 capita per sq. km. Although it is far lower than the EU average (115 cap/sq. km), it cannot be called low in absolute terms, as the world average density is approximately 45.2.

Average density is not a particularly useful indicator, since population distribution is highly uneven in Cyprus. About half of the population lives in the four largest cities. 27% of the Cypriot population lives in the capital, Nicosia, and a further 36.6% in Limassol, Larnaca, and Paphos. Thus most of the Cypriots live in an urban area (68.8 %) and only 31.2% of the population lives in the country. (*Reference: http://www.pio.gov.cy/cyprus/facts.htm*)

H.1.1. Age distribution

In 2002 the age structure followed a normal pattern. Namely the proportion of the old is lower, than the proportion of the young.

Table H1: Population by age groups in 2002, in %

Population by age groups (%), 2002	**%**
0-14 years	21.5
15-64 years	66.8
65+ years	11.7

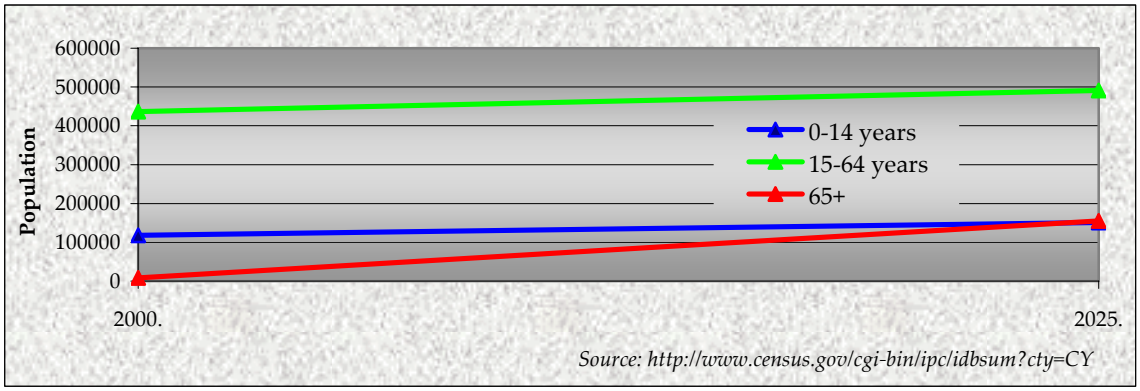
Reference: Statistics in Focus, Eurostat, Theme 4-17/2002

Compared to the European Union, both the proportion of children, and the proportion of adults between ages 15 and 64 are far above than the EU-average, therefore the ratio of the old is lower than in the EU. So contrary to the most Western-European countries we cannot talk about ageing population in the case of Cyprus.

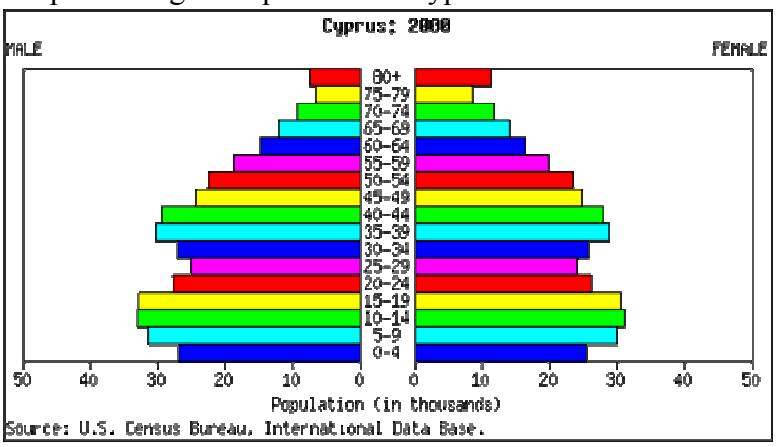
Examining the long-term dynamics of the Cypriot population, the trend (see in Graph H1.) stands out. A balanced growth can be forecasted by the year 202,5 counting with an average annual growth rate of 1.12%. By the year 2025 the number of adults over age 65 will not only reach, but also exceed the number of the young generation. According to this, the population dynamics will follow the ageing population pattern in the future, which is typical in most of the European countries.

H.1.2. Age composition

Graph H1: Population dynamics by age class

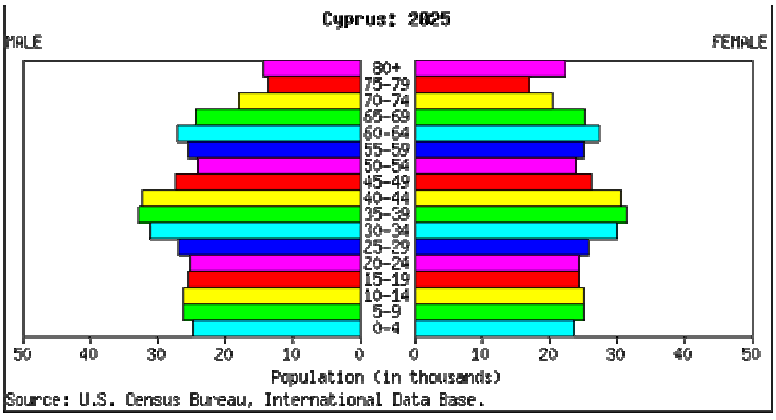


Graph H2: Age composition in Cyprus in 2000



Reference: http://www.census.gov/cgi-bin/ipc/idbsum?cty=CY

Graph H3: Age composition in Cyprus in 2025



Reference: http://www.census.gov/cgi-bin/ipc/idbsum?cty=CY

Examining the age compositions in Graph H2 and Graph H3, the above mentioned age structural change can be seen.

Graph H2 shows the age distribution in 2000, which follows a normal pattern. Namely, adults between 30-44 years are dominant in the population, therefore –as a cohors-effect - their children, between 5-19 years constitute the second main part of the Cypriotan population, whilst the people above 60 years make up a narrow layer. Hence the age structure forms a piramyd.

Contrary to year 2000, the age structure will shape dynamically, that is the proportion of the old will increase considerably. This change is due to the growth of life expectancy (see below), but first of all it can be originated in the declining child taking intention. Therefore the age structure will shift towards the ageing population.

The proportion of the adults between 30-44 years will be almost the same as in 2000, but due to decreasing fertility rates, the population is expected not to get reproduced, that is why the number of the old and young generation will level off by the year 2025 inflicting growing expenditures on the social system.

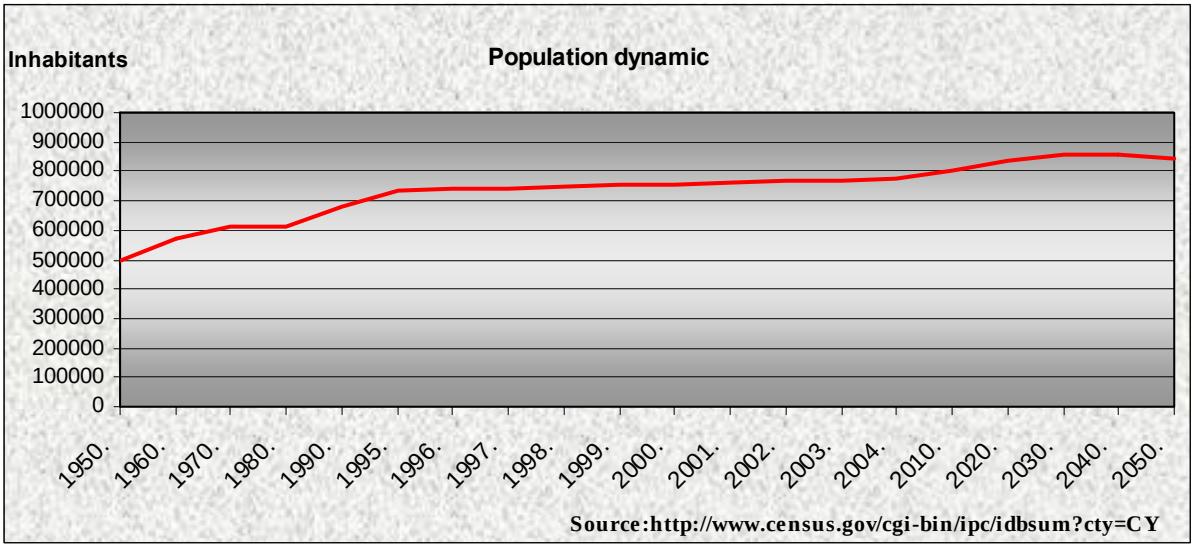
H.1.3. Population dynamics

Graph H4 shows a long-term prognosis for the population dynamics by the year 2050. In this graph two sharp booms stand out, once in the mid 1970s and then – as a consequence – in the mid 1990s. But this trend seems to be broken in 2040 and turns into a decline.

In 2002, the annual growth rate was 1.06%, hence during 2002 the population of Cyprus grew by 4427, compared with the 2001 figure of 4524. The population growth rate declines gradually from 1.2% in the period 2002-2006 to 0.7% in the period 2012-2016, 0.3% in the period 2022-2026, 0% in the period 2032-2036 and turns negative thereafter reaching –0.3% in the period 2047-2051.

The explanation for the positive population dynamics in the medium term is not related closely to a higher fertility rate (1.6 baby/woman) or a higher natural birth rate (4.3%), but it lies in the net migration rate. The number of live births has declined by 23% between 1990 and 2001. Nevertheless the increasing growth rate hides the decreasing trend of population at the first look, although it is made up of a high net migration ratio due to the "Cyprus affair". It is assumed that the annual number of net migrants would be +6000 in the period 2002-2006, +5,000 in the period 2007-2011, +4,000 in the period 2012-2016 and +3,000 thereafter till the end of the projection period in 2051.

Graph H4: Population dynamics between 2000 and 2050



H.1.4. Main economic and social effects of population dynamics

There were 314,000 people in the labour force in 1999, an increase of 38,400, or almost 14% over the 1990 level. This increase resulted from positive demographic trends.

Looking in the future, the medium-term growth of the labour force will be determined by underlying demographic trends and by expected developments in labour force participation. The demographic outlook in the period up to 2005 is relatively positive compared to that in the EU. Even on the assumption of zero net migration, the „natural increase" in the population of working age will be an order of 1% per annum over the next five years.

From 2005 onwards, labour force growth is projected to decelerate gradually, in view of the past fall in the fertility rate. Meanwhile this trend might be offset by an inflow of workers from EU countries after accession.

H.2. SWOT analysis

Strengths	**Opportunities**
Age composition, relatively high number of children. Rising annual growth rate.	Liberalization of the abortion law can raise the fertility rate. Restrictions on immigration.
Weaknesses	**Threats**
Declining fertility rate. Declining natural increase rate. Declining number of live births.	Ageing population in long-term. The health and social system has to account for rising expenditures.

I. CULTURAL AND SOCIOLOGICAL DATA

I.1. Changes in employment structures

I.1.1. Sectoral trends

All new employment in recent years has occurred in the services sector, where the number of jobs grew by 53, 700 (37%) between 1990 and 1999. Some 55% of the increased number of people employed in services during this period were women. By contrast over this same period, agricultural employment fell by 7, 200 (corresponding to a fall of 21%), while employment in the secondary sector fell by 8, 900 (representing a decline of almost 12%). The slow-down in aggregate employment growth in the second half of this period is reflected at the sectoral level as well –with the pace of decline in industrial employment being faster, and the services sector's growth in the employment being slower, over the years 1994-1999 as compared to the 1990-1994 period.

Within the services sector, the most rapid growth in employment over 1990-98 was in finance and business services, with an increase of over 64% (women's employment growth was 77%), although from a small base. Employment in community, social and personal services also grew rapidly - by over 40% - and, with an absolute increase of almost 21 000 jobs, was the single largest contributor to overall employment growth. Employment in trade, transport and communications rose by more than 30%, and the slowest growing part of the services sector was the hotels/restaurants industry, with an increase of just 26%. Within the industrial sector, manufacturing industries had a net employment decline of 21%, while construction employment in 1999 was merely 0.3% up on its 1990 level: job-gains in construction were, however, concentrated in the first half of the decade and employment fell slightly between 1995 and 1999.

The employment of women over the period 1990-1999 remained highly concentrated in a few sectors, namely in trade, hotels and restaurants, in community and personal services and in manufacturing. Women's employment in these sectors exhibited, over that period, an increase of 32%, 63% and a fall of 38% respectively.

The sectoral structure of employment differs somewhat from that in the EU. The share of employment in agriculture in 2000 was 0.4%, somewhat higher than in the EU, while the industrial sector's share is 2.1%, which is below the EU average. The services sector employment share is higher in Cyprus, exceeding 70%. Its composition is rather different; employment in hotels and restaurants (10% of total employment) and the trade and transport share at 24% are higher than in the EU, while employment in financial, business and community services with a share of 37% is relatively lower than in the EU.

As regards the sectoral structure of women's employment, 55% of the employed women were concentrated in 6 of the 60 NACE 2, i.e. retail trade, hotels and restaurants, education, public administration, business activities and health and social works – as compared to 60% in the EU.

I.1.2. Occupational trends

Change in the occupational structure reflects changes in the structure of production, i.e. the increasing and dominant role of the services sector, as well as the tendency of Cypriots to acquire higher educational qualifications. These changes have been accompanied by a rise in the share of professionals, clerks, and service and sales workers to the total gainfully employed population. The category of managers, professionals and technicians expanded by 16%, the category of clerks by 18%, and the number of services and sales workers grew by 26%. Manual jobs on the other hand shrank by 3%, largely due to the service concentration in the clothing and footwear industry in the last 5 years.

Over the same period women's employment rose by 16% with employment in clerical jobs exhibiting a sharp increase of 37%, managerial, professional and technical employment rising by 25%, service and sales occupations expanding by 32% while manual jobs dropped by 9%.

I.2. Migration

In Cyprus the net migration rate is the highest of the candidate countries, it accounts for 0.6%. The migration rate is one of the main components of demographic growth.

From 1990 until 2000 the number of migrants declined but in 2001 it reached the level of 1997 and since then this figure has been rising. Both the natural increase rate and the fertility rate have been declining continuously in line with each other from the year 1990. The natural increase rate fell below the net migration rate in 2001.

The number of foreign workers in Cyprus has been growing steadily during the last decade. In 1995 they amounted to 15,000 or 0.3% of the employed population and by 2000 their number topped 25,000 or 0.5% of the workforce. In the EU, overall 5% of workers are non-nationals. Apart from Luxembourg, only Austria (10%), Germany (9%) and Belgium (8%) have a concentration of foreign workers comparable to that in Cyprus.

More than a quarter of the foreign workers in Cyprus are employed by private households as domestic servants, 17% are employed in hotels and restaurants, 14% in wholesale and retail trade, 10% in manufacturing, 8% in agriculture and 7% in construction.

In some sectors, the presence of foreign workers co-exists with above average domestic unemployment rates. In elementary occupations the foreign labour accounted for 46% of all employment in 2001, at the same time unemployment in these occupations was running at 0.5%.

I.3. Mobility

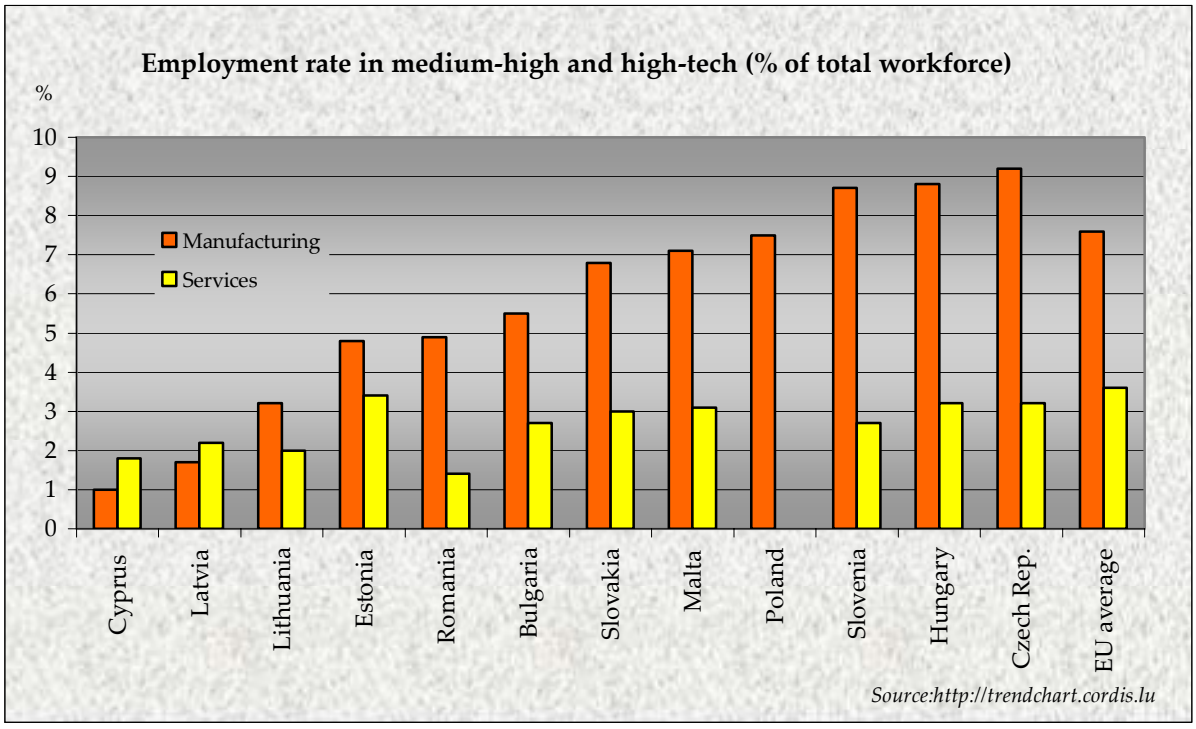
Recent evidence on the extent of labour mobility is limited. The largest movements occurred between occupations with closely related skill profiles and low retraining costs. Upward mobility and the consequent change in occupation typically occurred within the same enterprise. Labour mobility between sectors was lower than between occupations, amounting to 9%.

Nicosia and Limassol, the two most populous districts, together accounted for almost 67% of all employment in 2000. A comparison of the distribution of the employment with that of the

population shows that the employment rate was considerably higher in the main tourist resorts – 90% for Ammochotos and 76% for Pafos – while other districts had a significantly lower employment rate – Nicosia 66%, Larnaca 62% and Limassol only 59%. The urban and rural employment rate is almost the same, 66% for the former and 63% for the latter.

As Graph I1 shows, the employment rate in the field of medium-high and high-tech manufacturing and services in Cyprus is the lowest among the candidate countries. It can be due to only a few financial incentives for R&D, the lack of catching up with the new technologies, low level of technological development in manufacturing and little awareness of innovation management techniques.

Graph I1: Employment rate in international comparison in medium-high and high-tech manufacturing and services



I.4. Changes in income distribution

The increase of wages is estimated to 0.3% in nominal terms in 2002, in comparison to 0.8% in 2001. In real terms, the increase in wages is estimated to be confined to 2% in 2002 as opposed to 2.7% in 2001. The average monthly real wages rose by 40% between 1990 and 2002 and were higher than the increase in economy-wide productivity. There has been relatively little recent change in the dispersion of wages by occupation, at least at extremes of the earnings distribution. In 2002 legislators and managers were the highest-paid group, with earning just under 2.5 times the average for all workers, while the lowest paid – the elementary occupations – received just fewer than 70% of the average. There was some movement in the earnings of intermediate occupational groups, with declines in the relative earnings of technicians, services and workers.

These differences in earning by occupations can be partly explained by differences in educational attainment. Employees with university education have earnings approximately

four times greater than those of workers with only primary education. Workers with completed secondary education earn approximately twice as much as the lowest educated.

I.5. Private consumption patterns

Private consumption demand for goods is projected to record a relatively low expansion. The deceleration of private consumption was reflected to a smaller degree on the imports of goods for home consumption. Imports of consumer goods for home consumption, including private vehicles, recorded an increase of 0.8% during the period January-May compared to an increase of 1.9% in the respective period of 2001. The smaller deceleration of the rate of increase of imports of consumer goods for home consumption is due to the large demand for durable consumer goods - furniture, electrical appliances, and motor vehicles – before the rise in the basic VAT rate from 10% to 13% from 1 July 2002.

I.6. Role of NGO's

Many jobs were created in the private non-profit sector, its main representative being the Cyprus Institute of Technology (CIT). It is a private, non-profit organisation established in 1991 as a joint initiative of the Ministry of Commerce and Industry, the Cyprus Chamber of Commerce and Industry and the Industrialists' Federation. The mission of the Cyprus Institute of Technology is to form the main vehicle for providing technological upgrading and development in the manufacturing sector. The result of these developments has been a noticeable increase in personnel, though not in all occupations. There was a great increase in researchers – more than 145% from 1991 to 2001 – and an even more significant increase in other supporting staff. The number of technicians however increased at a comparatively low pace, from 153 to 187.

I.7. Case study

How can innovation be used for dealing with the Cyprus Problem?

Cyprus has been partitioned into segregated Greek and Turkish communities, separated by a buffer zone that is patrolled by the United Nations Force in Cyprus. The continuing division of the island has obstructed physical contact between the two communities.

The project, Technology for Peace (TFP) – www.tech4peace.org - was to enhance in Cyprus the right of communication, by applying modern technology with emphasis on the usage of Internet and Internet-based applications.

It began its operations in 1996, with two activities that were mostly funded by their participants. The aim was to set up a bi-communal, virtual organisation on the Internet to discuss matters of general interest and attempt to inform and recruit Cypriots, both Greek and Turkish, who live abroad.

The goal of the project is to design and develop a comprehensive virtual infrastructure for peace, promoting individuals and groups and indirectly support their activities by introducing an Information Technology dimension to their work. Furthermore, the project aims to become the central reference, information and meeting point, which would provide ideas and inspiration to the various peace-building initiatives. The programme provides access to the

content underpinning bi-communal projects in Cyprus, monitor their results and disseminate their potentials to a wider audience.

The Technology For Peace Office has assumed the responsibility to co-ordinate Forty Non Governmental Organizations in Cyprus, who have formed a platform to jointly support a "solution now!" that is to manage to terminate the division of the homeland.

DIAGNOSIS OF FACTORS AND IMPACTS IN THE INFORMATION SOCIETY IN CYPRUS

There are four major factors that influence the relative evolution of the ICT/IST in Cyprus, including:

1. The general level of economic development and the structure of economy,
2. The policies and attitudes towards the development of the ICT/IST sectors
3. The institutional framework and educational factors
4. The expenditures directly related to R&D and information society sectors.

1. Economic background and structural features

One important factor influencing ICT development and use of IST related services and products in Cyprus is the general economic background and the structure of the economy.

Cyprus is a high-income market economy with stable macroeconomic situation. GDP per capita amounts to EUR 18 500, which is about 80 % of the EU average with which it is on the first place among all Candidate Countries. Per capita income among Cypriots is higher than in Greece or Portugal. The unemployment rate is low, being around 3.4% in 2002. The strong private sector holds a predominant role in the production and investment process, while public sector is active where the private initiative is lacking. The main engine for growth is tourism.

While the manufacturing is the most important industrial contributor to national income, it has recently been in decline due to the gradual opening of the domestic market, liberalization of imports and structural problems affecting the traditional manufacturing sector. Manufacturing tried to adapt through the containment of unit labour costs and increase of private investments. Manufacturing is followed by construction, electricity, gas and water supply and finally by mining and quarrying.

The labour force of the country is of very good quality, shown by its extremely good and rising productivity and low unemployment level. The level of the infrastructure facilities including telecommunications and transportation are rather satisfactory.

Another structural factor influencing the development of ICT/IST is the role of the services and their structure. The services sector, and in particular tourism, has been the primary source of the impressive economic performance. Almost two thirds of the population (65%) is employed in this sector. Although industry and agriculture still employ about 30% of the population, their contribution to GDP is much lower (21% for industry, 4% for agriculture) and has been declining every year. In 2001, almost 3 million tourists visited the southern part of the island. The share of trade and tourism amounted to 22% in 2001. The Cypriot economy benefits from productivity gains of the service sector. This sector shows an impressive growth during the last years.

Besides the high share of services in GDP, two things are important: the high levels of public administration and defence services, as well as the low ones of the financial intermediation. The former is due to the fact that Cyprus is an island, which needs more military and public protection than a continental country. The latter might be explained by the general state-of-affairs of the economy in the 1990s. Even if the education sector has a low contribution to the national income, its level is higher than in other accession countries, which shows a well developed education strategy.

Concerning the evolution of the productivity in the service sector the real estate, renting and business activities were declining sectors during the second part of the nineties, up to the recent past, when it seemed to reach a stagnating path regarding its productivity. However, it

is still the most important sector for the economy. The evolution of productivity of other sectors was more or less stagnating, except for the financial intermediation sector, which had an increasing productivity share. This is clearly a rising sector, becoming the second one in importance by the end of nineties. On the other hand, even if the wholesale and retail trade is a large sector, its productivity is rather low, being the worst performing branch of the services sector.

Labour productivity is the highest in the tertiary sector and the lowest in the primary one. What it is really interesting for us are not particularly the values, but the evolution of the sector's productivity. The average productivity growth between 1995–2000 was slightly higher in the secondary sector. This could be explained by the constantly high growth of productivity in mining and manufacturing.

The domestic financial sector is large relative to the size of the economy, and banking, which dominates the financial sector, is well developed with commercial banking arrangements and practices follow the British model. Strong correspondent networks are maintained around the world by local and international banks, which have an easy access to the world-banking network and are able to carry out traditional and specialized financial transactions.

The banking sector provides effective intermediation between savers and investors. At the end of 2001, its assets amounted to around 280% of GDP, the private credit-to-GDP ratio was at 125% of GDP, the growth of the nominal credit towards the private sector was about 11.45% on average in the period 1996–2000, and reached 15.2% in 2001. The ratio of private sector deposits/GDP amounts to approximately 196% at the end of 2001. Banks are already allowed to provide credits denominated in foreign currency following gradual liberalization. Thus, lending more than doubled from 4.6% of total lending in 1996 to 10.4% in 2001. Nearly 60% went to the tourist sector and foreign trade.

The offshore financial sector is not as large as other offshore centres. The development of the offshore sector in Cyprus has been facilitated by its location, preferential tax regime, extensive network of double tax treaties, a legal and accounting framework based on UK law and practice, and high quality infrastructure. Its contribution to employment and foreign exchange earnings is much smaller than of tourism. Banking is the most important offshore activity. Its assets are at about 11.7 billion Euro. It is followed by commerce.

Employment structure mirrors the general properties of the Cypriot economy: agriculture is a bit more important than in the EU on average, while industrial sector is not that weighty. In the services sector, due to the importance of tourism, most jobs are available in hotels, restaurants, trade and transport. Women's employment grew in the past decade, with most of women in services related to tourism, and other service sectors.

While unemployment in Cyprus is rather low, in some sectors unemployment of domestic workforce and above average presence of foreign workers coexists. This is the case in unskilled jobs.

In tertiary education, half of the Cypriots study abroad: and meanwhile, international companies operating in Cyprus prefer to employ their own foreign staff. In ICT-related jobs, 40% of the employed were foreign nationals in 2000. However, this process is not accompanied with above average unemployment of Cypriot ICT professionals.

2. The policies and attitudes towards the development of the ICT/IST sectors

Regarding ICT and IST development, Cyprus is a very special case compared to most of the other transition countries. The main driving force behind IST development is the realisation (by both the government and the public) of Cyprus' geographical location, which stipulates that the only way to catch up is to invest heavily in ICT tools and use. This might be the reason why exact IS policies were not designed until the EU made it a clear target, developing computerisation, digitalisation and Internet access in order to be able to communicate with the rest of the world have to be a part of all other development strategies. Tourism, banking, shipping are all the types of services where updated communication is extremely important, therefore Cyprus relies to a great extent on the quality of its involvement in Information Society. Even if infrastructure is first created mainly for providing information on these services, the switch to a more developed use of ICT tools and cyberspace becomes easier.

The institutional setting is created for IS development and regulation, the problems lies in the environment where decisions are made. Because of the long-lasting monopolistic power of CYTA, the fix-line operator (and owner of the one single mobile-operator) the lobby power of the company is very strong, the decision makers are easily influenced by it. It was only very strong EU and international request that made a change and now market liberalisation process has started. We can expect the prices to get even lower (although they are not high in international comparison) as competition becomes a factor, and penetration rates of access to increase.

3. The institutional framework and the education sector

The education system in Cyprus is well developed. While the age until students are obliged to stay in school is low compared to other European countries, enrolment rates and outcomes of the educational system show, that this does not threaten the general level of education of the Cypriot population. The Cypriot workforce is educated to an above average level, and still, a policy emphasis is attached to education.

In the past ten years, enrolment rates to primary and secondary education increased rapidly. Government expenditure evolved in line with this progress. Moreover, the share of government spending on education from the total budget is above international average, when all levels of education are considered. In tertiary education, half of the students choose foreign institutions in Greece, in the US or in GB. Thus, primary and secondary education provides an internationally competitive education level to the students. Besides the state funded education system, several private schools operate in both primary and secondary education. This leads to competition in education, and increases funds channelled into education, since most of private schools rely on private funds, collect fees for education. Private schools place a strong emphasis on teaching foreign languages, and promote the spread of flexible, skill-oriented teaching in the whole educational system.

In tertiary education, over the past ten years, the amount of students deciding to study abroad did not change significantly. Partly due to the establishment of a new Cypriot university, year by year more students decide to pursue education in their home country, and so by 2001 the number of leaving and staying students is approximately equal. Tertiary education in Cyprus is organized to be compatible to western systems, with college level degree programmes and university level degree programmes. This improves the prospects of mobility of students during and after their studies. The share of state funding of tertiary education from the total budget is small in EU average, but per capita data or any other indicator to evaluate spending is not available.

The fact that education is a policy priority in Cyprus is also supported by several planned and already implemented reforms. Traditionally, vocational training is not among the best functioning sectors of education in Cyprus. Nevertheless, it has been recognized, and the teaching profile of vocational and technical schools was given a more general profile. Thereby it is visible, that the Cyprus government has recognized, that in the approaching information age with faster changes, the labour market chances of students can be improved mainly in this way.

A policy reform is underway also in ICT-teaching. Until last years, ICT-related subjects were taught only in the second stage of secondary education. While some schools were already providing the opportunity to study ICT-related topics in lower grades, now the policy proposal 'Orama' intends to introduce information technology education already in primary schools. This way the ICT literacy of students shall be improved.

In tertiary education, ICT-related teaching curriculum is well developed and contains most up-to-date knowledge. Still, ICT use in general tertiary education would need further improvements, for example by more widespread use of multimedia teaching material in classes.

The recent reform that had made vocational school curriculum more general, did not solve all problems of this type of education. Additional measures would be needed to prevent the threat of skilled labour shortages.

As far as the state of innovation is concerned, the current institutional structure is too fragmented. Links between industry and the academia are weak, businesses participate in an under average level in innovation. This may be due to the fact, that in ICT industry, several multinational companies are present in the Cyprus market, with foreign innovation centres. The Cyprus Academia would need to be made more attractive for businesses.

Innovation improvement, and further spread of information and communication technologies would help in the Cyprus problem, even if only it would provide help in the communication of the separated people.

4. The expenditures directly related to R&D and the information society sectors

An important factor influencing the development of ICT is the low level of R&D and related expenditures in Cyprus. In 2000, while the expenses on R&D of the Czech Republic and Slovenia amounted to more than 1.30% of their respective GDP Cyprus, Latvia and Romania spent less than 0.50% of their GDP. Nevertheless, the acceding countries aggregate Expenses on R&D to GDP ratio of 0.84% was less than half the EU average in 2000 and much lower than the US and Japan’s levels.

Cyprus has always spent very little of its GDP on R&D activities: while at the beginning of the nineties this figure was at about 0.18% of the GDP, in the late nineties and in 2000 increased only slightly, reaching 0.27% of the GDP by the end of 2001. This value is still significantly low in both international and regional comparison.

Another factor that influences ICT in Cyprus is that unlike in the EU, where the business enterprise sector is the foremost performer of R&D, in Cyprus the government sector still dominates R&D even if in a decreasing manner. It is followed by the higher education and the business enterprises sector. The private and non-profit sectors still have a low share, but its importance in the R&D involvement is growing nowadays. A related difficulty is that the number of researchers and related personnel is still very low in Cyprus in international comparison, and this group is strongly underutilized.

The priorities government sets in the distribution of its R&D funds indicate, that government is not that IST-conscious than in education. While R&D support to Engineering and Technology sector increased significantly until 2001, this increase is still only a quarter of the increase in the Natural Science sector.

Government policy is now increasingly oriented towards promotion of innovation: it intends to increase total government spending on R&D and innovation, support business 'incubators' of high technology firms, the establishment of a new Research, Technology and Development Centre, and attract FDI.

SCENARIOS OF FUTURE DEVELOPMENT OF THE INFORMATION SOCIETY

Two alternative scenarios are presented concerning the development of the information Society in Cyprus. The two scenarios differ in the extent of the priority attached by the government to the development of the use of IS goods and services.

The Cypriot economy as described in the text and also in the preceding Diagnosis part of the report has good economic background to proceed fast with the use of Information Society technologies. The level of economic development is high, the per capita GDP is the highest among the New Member States, the structure of economy (the strong role of IT related banking shipping and tourism is high in production) is conducive for the development of IT application, spread of B2B and B2C. Even with high wages the economy remains competitive in various smaller market niches which could also lead to a more aggressive future deployment of IT production in the economy. The education sector is well developed, the primary, secondary and tertiary enrolment rate is high and the quality of education output is also good both in comparison with new and old members of the European Union. In terms of access the Cypriot economy and society is in good position as income levels, communication prices provide an affordable access for most of the users. Finally, language problems, which frequently are a significant contrasting factor for IS developments in other smaller new member states are of no importance for Cyprus as the English is generally used and spoken.

With all background in terms of human d physical capital, level of economic development, and the structure of economy, the development of IST use depends crucially on government policies. So far government policies have not been very active and far reaching gin developing the information society, even if the government recognised the strategic importance of this sector for the development of the Cypriot economy. Policies remained fragmented, uncoordinated and several important measures were not employed to the extent it could have been. If the government puts more emphasis, funding and attaches higher priority to IS developments, than it may lead to real breakthrough in the use of information sector goods and services.

The government has three areas of intervention with which it may significantly contribute to the spread of information society. The speed and extent of these interventions will strongly influence the outcome of the information society developments. First, it needs to develop much faster eGovernment services, digitalization of public administration, broadening the quality of public services available online. While access costs and possibilities are crucial for the evolution of the use of Internet and IST services, content plays an equally important role. The government has so far attached low importance to the development of eGovernment and public eServices, and therefore quality an quantity of available public services remains limited both at the level of national government and also local governments. If the policy makers attach greater importance to the supply side of eGovernment and eServices from the government sector, than there is a much better prospect for the development and more active use of IS by the households and population.

Second, the government has to play a more active regulatory role and try to keep the markets competitive in order to mitigate the degree of direct or indirect price increases by the producers and service providers. Market regulation has remained weak in Cyprus, and markets are far from being competitive, which keeps access prices higher than they would be under competitive market conditions. If the government is more active with competition policy, deregulation and fight against abuse of market power, than access conditions may

improve further providing a general boost both for public eServices (eGovernment) and private eServices (eCommerce).

Finally government should be more active and coordinated in emphasizing the need for IT related developments in the economy and society. The government policies have been less coordinated, determined and forward-looking than their counterparts in such countries as Slovenia, Estonia or Lithuania, which focused more directly at convincing the users about the benefits of electronic communication. So far policies have neglected this aspect, have not concentrated on education of IT skills and this may have hindered spread of IT usage.

If the government achieves a real breakthrough in these areas, than the take-off of the use of IS sevr3eices may be significant in Cyprus as the general economic background is conducive for such development and good government policies added it could significantly increase use of IST services.

If government policies fail to achieve this important change, than the process will completely be driven by the markets, which may be slower than with government policies. It would not mean a serious break in the evolution of information society but would slow down the catch up of the economy in general and also in terms of IS indicators.

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All tables, including those presented in the report and those only cited, can be found in this Annex. All are based on data from the Eurostat and World Bank databases. The source is therefore not indicated below each table or chart, unless it is other than Eurostat or the World Bank.

Table 1. **EU Share of Foreign Trade in Regional Comparison (average of 1990 – 2001)**

Country	Imports from the EU	Exports to the EU
Cyprus	50,22%	39,31%
Czech Republic	60,53%	62,60%
Estonia	58,40%	59,79%
Hungary	59,65%	68,74%
Latvia	50,20%	52,50%
Lithuania	44,14%	42,52%
Poland	64,08%	67,40%
Slovakia	43,76%	49,58%
Slovenia	67,39%	64,31%

Table 2. **The import and export shares of the main trading partners of Cyprus**

		Export share				Import share	
	EU	North America	Japan		EU	North America	Japan
1990	56,48%	7,55%	11,52%	1990	50,57%	1,76%	0,46%
1991	54,43%	8,32%	11,34%	1991	45,71%	1,49%	0,25%
1992	54,20%	8,66%	10,18%	1992	41,50%	1,60%	0,27%
1993	56,67%	9,87%	8,11%	1993	39,89%	2,05%	0,28%
1994	52,70%	11,16%	6,84%	1994	36,25%	1,67%	0,19%
1995	51,70%	13,70%	6,68%	1995	34,80%	1,29%	0,18%
1996	48,57%	17,18%	5,96%	1996	29,50%	0,76%	0,12%
1997	45,73%	19,27%	5,27%	1997	25,87%	1,18%	0,12%
1998	53,16%	12,96%	7,43%	1998	35,63%	1,98%	0,30%
1999	52,70%	11,26%	6,74%	1999	40,51%	4,09%	0,17%
2000	51,66%	10,69%	5,79%	2000	36,44%	2,44%	0,13%
2001	39,29%	4,60%	6,27%	2001	56,99%	2,99%	0,30%
	50,22%	11,08%	14,67%		39,47%	1,91%	0,23%

Table 3. **GDP data for Cyprus**

Nominal GDP (mln CYP)	GDP / capita (CYP)	GDP / capita (PPS)	EU GDP / capita (PPS)	Candidate Countries GDP / capita (PPS)
2555,7	n.a.	n.a.	n.a.	n.a.
2674,7	n.a.	n.a.	n.a.	n.a.
3102,9	5082	n.a.	n.a.	n.a.
3285,4	5247	n.a.	n.a.	n.a.
3663,2	5759	n.a.	n.a.	n.a.
4006,6	6244	n.a.	n.a.	n.a.
4159,6	6418	15400	18500	7900
4373,1	6676	16100	19400	8500
4697,8	7107	17000	20300	9000
5030,4	7549	18100	21300	9500
5511,8	8200	17600	22600	10000
5880	8699	18500	23200	10400
6191,5	n.a.	n.a.	n.a.	n.a.

Table 4. **Evolution of the Main Sectors of the National Economy of Cyprus**

Year	Agriculture, hunting, forestry and fishery (mln CYP)	Industry (mln CYP)	Services (mln. CYP)	Wholesale and retail trade (mln. CYP)	Other activities
1990	n.a.	n.a.	n.a.	n.a.	n.a.
1991	n.a.	n.a.	n.a.	n.a.	n.a.
1992	n.a.	n.a.	n.a.	n.a.	n.a.
1993	n.a.	n.a.	n.a.	n.a.	n.a.
1994	n.a.	n.a.	n.a.	n.a.	n.a.
1995	199,5	897	1616,4	520,1	-3233
1996	189	925,2	1709,8	532,9	-3356,9
1997	178,1	944,9	1877,6	558,5	-3559,1
1998	198,9	982,8	2050,8	612,5	-3845
1999	203,8	1013,8	2295,8	626,6	-4140
2000	199,2	1065,6	2548,5	681,4	-4494,7
2001	226,1	1119,6	2725,6	720,7	-4792
2002	248	1171,3	2773,5	752,6	-4945,4

Table 5. **Structural Evolution of the Sectors of the Cypriot Economy (from real values)**

Year	Agriculture, (%)	Industry (%)	Services (%)	Trade (%)	Other activities (%)
1995	4,98%	22,39%	40,34%	12,98%	19,31%
1996	4,54%	22,24%	41,10%	12,81%	19,30%
1997	4,07%	21,61%	42,94%	12,77%	18,61%
1998	4,23%	20,92%	43,65%	13,04%	18,15%
1999	4,05%	20,15%	45,64%	12,46%	17,70%
2000	3,61%	19,33%	46,24%	12,36%	18,45%
Average	**4,25%**	**21,11%**	**43,32%**	**12,74%**	**18,59%**

Table 6. **The Importance of Tourism (from real values)**

Year	Income from Tourism (% of services)	Income from Tourism (% of GDP)
1995	50,11%	20,22%
1996	45,62%	18,75%
1997	44,90%	19,28%
1998	42,81%	18,69%
1999	44,65%	20,38%
2000	46,85%	21,66%
Average	**45,82%**	**19,83%**

Table 7. **Expenditure of Real GDP (million. CYP)**

Year	Nominal GDP (mln CYP)	Government final consumption (mln. CYP) G	Private final consumption (mln. CYP) C	Gross fixed capital formation (mln. CYP) K	Increase in stocks (mln. CYP)	Exports of goods and services (mln. CYP)	Imports of goods and services (mln. CYP)	balance of exp-imp. Net Exports
1990	**2555,7**	443,1	1532,2	628,5	54,4	1316,8	1456,3	-139,5
1991	**2674,7**	493,3	1754,1	650,2	6,2	1260,8	1526,9	-266,1
1992	**3102,9**	590,7	1938,6	795,9	77,9	1544,4	1881,6	-337,2
1993	**3285,4**	552,5	1934,3	741,2	34,6	1555,2	1569,4	-14,2
1994	**3663,2**	608,1	2111	751,5	170	1741,1	1755,5	-14,4
1995	**4006,6**	644,7	2551,8	769,7	110,3	1870,1	1999,7	-129,6
1996	**4159,6**	748,9	2704,3	848,1	78,3	1952,1	2208,8	-256,7
1997	**4373,1**	821,6	2879,6	829,8	34,5	2056,9	2274,8	-217,9
1998	**4697,8**	902,5	3160,3	903,9	70,9	2044,2	2398,2	-354
1999	**5030,4**	860,3	3316,3	909,9	75	2236,8	2387,1	-150,3
2000	**5511,8**	913,3	3764,1	968,5	124,3	2554,9	2868,6	-313,7

Table 8**. Changes in the Expenditure of Real GDP (%)**

Year	Government final consumption (mln. CYP) G	Private final consumption (mln. CYP) C	Gross fixed capital formation (mln. CYP) K	Increase in stocks (mln. CYP)	Exports of goods and services (mln. CYP)	Imports of goods and services (mln. CYP)	balance of exp-imp. Net Exports
1990	0,173377157	0,599522636	0,245920883	0,021286	0,51524	0,569824	-0,05458
1991	0,184431899	0,655811867	0,243092683	0,002318	0,47138	0,570868	-0,09949
1992	0,190370299	0,624770376	0,256501982	0,025106	0,497728	0,6064	-0,10867
1993	0,16816826	0,588756316	0,225604188	0,010531	0,473367	0,477689	-0,00432
1994	0,166002402	0,576272112	0,205148504	0,046408	0,475295	0,479226	-0,00393
1995	0,160909499	0,636899116	0,192108022	0,02753	0,466755	0,499101	-0,03235
1996	0,18004135	0,650134628	0,203889797	0,018824	0,4693	0,531013	-0,06171
1997	0,187875878	0,658480254	0,189750978	0,007889	0,470353	0,52018	-0,04983
1998	0,192111201	0,672719145	0,192409213	0,015092	0,43514	0,510494	-0,07535
1999	0,171020197	0,659251749	0,180880248	0,014909	0,444656	0,474535	-0,02988
2000	0,165699046	0,682916652	0,175713923	0,022552	0,463533	0,520447	-0,05691
Average	**0,17636429**	**0,636866805**	**0,210092766**	**0,019313**	**0,471159**	**0,523616**	**-0,05246**

Table 9. **Structural Change in the GDP Expenditures**

Year	Government final consumption (%)	Private final consumption (%)	Gross fixed capital formation (%)	Exports of goods and services (%)	Imports of goods and services (%)
1991	13,02%	16,22%	5,02%	-2,80%	6,44%
1992	17,27%	8,24%	19,88%	19,97%	20,69%
1993	-5,64%	0,66%	-6,05%	1,59%	-15,85%
1994	9,91%	8,99%	1,25%	11,80%	11,70%
1995	8,36%	23,55%	4,68%	9,78%	16,42%
1996	17,41%	7,12%	11,37%	5,51%	11,65%
1997	9,11%	5,90%	-2,69%	4,80%	2,43%
1998	10,04%	9,94%	9,12%	-0,44%	5,61%
1999	-4,50%	5,13%	0,85%	9,63%	-0,28%
2000	4,25%	11,46%	4,52%	12,16%	18,00%

Table 10**. Unemployment in Cyprus (%)**

	Unempl. Rate (%)
1990	1,8
1991	3
1992	1,825
1993	2,633
1994	2,7
1995	2,6
1996	3,1
1997	3,4
1998	3,4
1999	3,6
2000	3,4
2001	3
2002	n.a.

Table 11. **Unemployed by level of education (%)**

	1995	1996	1997	1998	1999	2000	2001*
No schooling	1	0,9	0,9	0,8	0,7	0,6	0,4
Primary	27	26,6	27,2	27,4	29,5	28,1	24
Secondary General	44,6	45,1	44,8	43,6	43,2	45,8	46,5
Secondary Technical	6,3	6,8	7,3	8,3	8,1	8,9	9,3
Third	21,1	20,7	19,8	19,9	18,5	16,6	19,9

Table 12. **Employment Structure of Cyprus Economy**

%	1995	1996	1997	1998	1999	2000	2001*
Economic Activity	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Agriculture, hunting and forestry	10,13%	9,63%	8,75%	8,60%	8,25%	7,89%	7,61%
Fishing	0,39%	0,39%	0,42%	0,45%	0,44%	0,46%	0,42%
Total 1	**10,52%**	**10,02%**	**9,17%**	**9,05%**	**8,69%**	**8,36%**	**8,03%**
Mining and quarrying	0,25%	0,25%	0,21%	0,21%	0,20%	0,20%	0,20%
Manufacturing	15,53%	14,78%	14,29%	13,74%	12,90%	12,17%	12,09%
Electricity, gas and water supply	0,49%	0,49%	0,49%	0,52%	0,51%	0,50%	0,49%
Construction	9,78%	9,56%	9,42%	9,05%	8,90%	8,79%	8,75%
Total 2	**26,05%**	**25,08%**	**24,40%**	**23,52%**	**22,51%**	**21,66%**	**21,52%**
Wholesale and retail trade; repairs	17,47%	17,79%	18,17%	18,18%	17,96%	17,98%	17,88%
Hotels and restaurants	10,62%	10,51%	10,40%	10,41%	10,76%	10,95%	10,79%
Transport, storage and communication	6,32%	6,44%	6,69%	6,83%	6,93%	7,10%	7,22%
Financial intermediation	4,34%	4,48%	4,62%	4,75%	5,20%	5,31%	5,10%
Total 3	**21,28%**	**21,44%**	**21,71%**	**21,99%**	**22,89%**	**23,35%**	**23,11%**
Real estate, renting and business activities	4,24%	4,38%	4,52%	4,79%	4,92%	4,94%	5,01%
Public administration and defense; Compulsory social security	6,42%	6,51%	6,69%	6,87%	7,03%	7,10%	7,22%
Education	4,69%	4,97%	5,22%	5,27%	5,33%	5,34%	5,53%
Health and social work	3,64%	3,75%	3,85%	3,88%	3,90%	3,98%	4,00%
Other community, social and personal services activities	4,27%	4,31%	4,34%	4,34%	4,48%	4,71%	4,71%
Total 4	**19,03%**	**19,54%**	**20,10%**	**20,36%**	**20,75%**	**21,13%**	**21,46%**
Total Services (Total 3 +Total 4)	**40,31%**	**40,98%**	**41,81%**	**42,35%**	**43,63%**	**44,48%**	**44,57%**
Private households with employed persons	1,41%	1,75%	1,93%	2,12%	2,28%	2,59%	2,99%
Extra territory, organ and bodies	1,09%	1,09%	1,05%	1,01%	0,95%	0,93%	0,91%

Table 13. **GDP Structure by Employment**

Sector	Primary	Secondary	Tertiary
1995	10,52%	26,05%	63,43%
1996	10,02%	25,08%	64,90%
1997	9,17%	24,40%	66,43%
1998	9,05%	23,52%	67,44%
1999	8,69%	22,51%	68,79%
2000	8,36%	21,66%	69,99%
Average	**9,30%**	**23,87%**	**66,83%**

Table 14. **GDP Structure by Sectors**

Sector	Primary	Secondary	Tertiary
1995	4,98%	22,39%	72,63%
1996	4,54%	22,24%	73,21%
1997	4,07%	21,61%	74,32%
1998	4,23%	20,92%	74,85%
1999	4,05%	20,15%	75,80%
2000	3,61%	19,33%	77,05%
Average	**4,25%**	**21,11%**	**74,64%**

Table 15. **Evolution of the Sector Productivity in Cyprus**

Sector	Primary	Secondary	Tertiary	Yearly Percentage Change		
1995	6,49885718	11,7996671	15,71972	**Primary**	**Secondary**	**Tertiary**
1996	6,47713122	12,6765716	16,12576	-0,33%	7,43%	2,58%
1997	6,63193572	13,2336662	16,71694	2,39%	4,39%	3,67%
1998	7,44524028	14,1680895	17,67914	12,26%	7,06%	5,76%
1999	7,79645794	14,9748213	18,43342	4,72%	5,69%	4,27%
2000	7,59193676	15,6900764	19,35478	-2,62%	4,78%	5,00%
Average	**7,11170396**	**13,7626955**	**17,38072**	**3,28%**	**5,87%**	**4,25%**

Table 16. **Yearly Percentage Change of the Productivity within the Sectors (%)**

Year	1996	1997	1998	1999	2000
Agriculture	-1,40%	2,43%	13,72%	3,98%	-1,59%
Fishing	23,90%	-3,28%	-9,91%	16,24%	-15,65%
Mining	2,09%	14,21%	27,20%	8,82%	8,79%
Manufacturing	7,63%	6,24%	6,92%	8,52%	6,96%
Electricity	4,81%	2,43%	0,80%	-0,52%	17,73%
Construction	6,99%	1,36%	6,27%	2,72%	-2,15%
Trade	0,92%	2,02%	8,77%	1,56%	4,19%
Hotels	-1,23%	9,67%	8,23%	6,84%	7,14%
Transport	4,09%	2,31%	8,12%	7,97%	3,62%
Financial intermediation	4,74%	8,42%	5,92%	17,91%	6,76%
Real estate	4,81%	3,88%	1,28%	2,03%	4,26%
Public administration	7,10%	6,13%	4,16%	2,04%	3,31%
Education	3,01%	5,67%	6,12%	2,92%	4,67%
Health and social work	6,98%	4,78%	6,06%	4,68%	1,62%
Other services activities	9,25%	12,17%	9,79%	1,59%	1,08%
Private households with employed persons	0,59%	-0,73%	0,02%	0,02%	-5,63%

Table 17. **Labour Force Structure by Age and Labour Force Participation**

Year	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Population distribution (%)						
0 - 14 years	24,6	24,3	23,8	23,4	22,8	22,3
15 - 64 years	64,3	64,6	65	65,5	66	66,4
65 years and over	11	11,1	11,1	11,1	11,2	11,3
Total Population (thousands)	730	740	740	750	750	760
15 - 64 years (thousands)	469,39	478,04	481	491,25	495	504,64
65 years and over (thousands)	80,3	82,14	82,14	83,25	84	85,88
Total pop. above 15 years (thousands)	549,69	560,18	563,14	574,5	579	590,52
Gainfully employed population (thousands)	283,3	285,5	285,6	288,3	294,5	301,5
L.F.P.	**0,51538**	**0,509658**	**0,5071563**	**0,5018277**	**0,5086**	**0,510567**

Table 18. **Evolution of the CPI**

Year	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Infla-tion	4,50 %	5,04 %	6,51 %	4,85 %	4,70 %	2,62 %	2,98 %	3,61 %	2,23 %	1,63 %	4,14 %	1,98 %	2,80 %

Table 19. **FDI inflows**

	FDI (mln. USD)
1990	126,615
1991	81,821
1992	107,441
1993	83,433
1994	75,1741
1995	85,761
1996	54,2556
1997	75,8906
1998	68,749
1999	121,374
2000	162,594
2001	163,27

Table 20. Gross Domestic Product at current market prices and in % by economic activity

mil. CYP	**Mining and quarrying**	**Manufacturing**	**Electricity, gas and water supply**	**Construction**	Total
1995	11,2	469,2	82,2	334,4	**897**
1996	11,4	479,2	85,9	348,7	**925,2**
1997	11	495,1	88,5	350,3	**944,9**
1998	14,1	512,9	95,4	360,4	**982,8**
1999	14,9	532,8	94,9	371,2	**1013,8**
2000	16,9	560,5	114,2	374	**1065,6**
2001	17,4	581,7	123,1	397,4	**1119,6**
2002	19	593,9	128,1	430,3	**1171,3**
%	**Mining and quarrying**	**Manufacturing**	**Electricity, gas and water supply**	**Construction**	
1995	1,25%	52,31%	9,16%	37,28%	
1996	1,23%	51,79%	9,28%	37,69%	
1997	1,16%	52,40%	9,37%	37,07%	
1998	1,43%	52,19%	9,71%	36,67%	
1999	1,47%	52,55%	9,36%	36,61%	
2000	1,59%	52,60%	10,72%	35,10%	
2001	1,55%	51,96%	10,99%	35,49%	
2002	1,62%	50,70%	10,94%	36,74%	

Table 21. Value Added per Employee

Value added per employee (CYP)						
	1995	**1996**	**1997**	**1998**	**1999**	**2000**
Mining and quarrying	15813,6	15972,0	18340,7	23289,2	25297,1	28026,5
Manufacturing	10664,5	11356,3	12131,2	12948,0	14024,6	15275,6
Electricity, gas and water supply	59214,6	61403,2	63239,6	63635,6	63184,5	75754,6
Construction	12069,3	12775,8	13020,6	13813,1	14162,3	14112,2
TOTAL	**97762,0**	**101507,3**	**106732,0**	**113685,9**	**116668,5**	**133168,9**
Wholesale and retail trade	10508,7	10492,1	10762,4	11686,0	11846,7	12569,7
Hotels and restaurants	11247,6	10991,1	12120,2	13094,7	13964,2	15235,8
Transport, storage and communication	17766,4	18296,3	18820,7	20314,0	21892,5	23100,5
Financial intermediation	16055,0	16637,5	18136,0	19175,9	22567,6	24535,2
Real estate, renting and business activities	41900,0	43447,0	45378,8	45881,2	46723,8	49610,2
Public administration and defence	18006,5	19078,8	20359,4	21170,1	21561,7	22684,7
Education	13381,7	13637,0	14488,6	15348,8	15767,5	16807,3
Health and social work	12170,1	12880,3	13569,1	14366,1	15010,2	15533,7
Other community social and personal sevices	10887,1	11767,5	13271,4	14545,8	14749,6	15182,4
Private households with employed persons	3579,9	3562,7	3555,8	3550,4	3544,5	3406,4
TOTAL	**155503,1**	**160790,4**	**170462,4**	**179133,1**	**187628,3**	**198666,0**
TOTAL ind. + services	**253265,1**	**262297,6**	**277194,5**	**292819,1**	**304296,8**	**331834,9**

Structure of the value added per employee as % of the sector						
	1995	**1996**	**1997**	**1998**	**1999**	**2000**
Mining and quarrying	16,18%	15,73%	17,18%	20,49%	21,68%	21,05%
Manufacturing	10,91%	11,19%	11,37%	11,39%	12,02%	11,47%
Electricity, gas and water supply	60,57%	60,49%	59,25%	55,97%	54,16%	56,89%
Construction	12,35%	12,59%	12,20%	12,15%	12,14%	10,60%
TOTAL	**100,00%**	**100,00%**	**100,00%**	**100,00%**	**100,00%**	**100,00%**
Wholesale and retail trade	6,76%	6,53%	6,31%	6,52%	6,31%	6,33%
Hotels and restaurants	7,23%	6,84%	7,11%	7,31%	7,44%	7,67%
Transport, storage and communication	11,43%	11,38%	11,04%	11,34%	11,67%	11,63%
Financial intermediation	10,32%	10,35%	10,64%	10,70%	12,03%	12,35%
Real estate, renting and business activities	26,94%	27,02%	26,62%	25,61%	24,90%	24,97%
Public administration and defence	11,58%	11,87%	11,94%	11,82%	11,49%	11,42%
Education	8,61%	8,48%	8,50%	8,57%	8,40%	8,46%
Health and social work	7,83%	8,01%	7,96%	8,02%	8,00%	7,82%
Other community social and personal sevices	7,00%	7,32%	7,79%	8,12%	7,86%	7,64%
Private households with employed persons	2,30%	2,22%	2,09%	1,98%	1,89%	1,71%
TOTAL	**100,00%**	**100,00%**	**100,00%**	**100,00%**	**100,00%**	**100,00%**

Table 22. Productivity Shares of the Cypriot Economy Between 1995–2000

%	Average of the Period	2000
Mining and quarrying	**7.36%**	**8.45%**
Manufacturing	4.44%	4.60%
Electricity, gas and water supply	**22.44%**	**22.83%**
Construction	4.65%	4.25%
Wholesale and retail trade	3.94%	3.79%
Hotels and restaurants	4.45%	4.59%
Transport, storage and communication	6.98%	6.96%
Financial intermediation	**6.80%**	**7.39%**
Real estate, renting and business activities	**15.86%**	**14.95%**
Public administration and defense	7.14%	6.84%
Education	5.19%	5.06%
Health and social work	4.85%	4.68%
Other community social and personal services	4.67%	4.58%
Private households with employed persons	1.23%	1.03%

Table 23. **Evolution of the R&D Expenditures**

	1991	1992	1998	1999	2000	2001
R&D Expenditure (thousands of CYP)	4,835	5,578	10,783	12,417	14,068	15,832
- in real terms	4,654	5,258	10,541	12,161	13,529	14,891
- as percentage of the Cypriot GDP	0.18 %	0.18 %	0.23%	0.25%	0.26%	0.27%

Table 24. **ERD in the Candidate Countries and EU Member States**

	Mil ECU/Euro		% of country GDP	
Year	**1995**	**2000**	**1995**	**2000**
Bulgaria	62	71.5	0.62	0.52
Cyprus (1)	**18.2**	**24.5**	**0.23**	**0.26**
Czech Republic	403	744	1.01	1.33
Estonia (1)	30.1	37	0.61	0.66
Hungary	250.4	405.3	0.73	0.8
Lithuania	17.8	37.5	0.53	0.48
Latvia	22	73.1	0.48	0.6
Poland	672.7	1196.6	0.69	0.7
Slovakia	138.3	142.9	0.94	0.67
Denmark	2530.6	3604.2	1.84	2.07
Germany	42437.9	50316.4	2.26	2.48
Spain	3623.8	5719	0.81	0.94
France	27446.6	30152.7	2.31	2.13
Austria	2797.4	3687.5	1.56	1.8
Finland	2262.7	4422.6	2.29	3.37
UK	17097.2	28757.4	1.97	1.85
Acceding countries (1)	2477	2958.2	0.83	0.84
EU-15	124427	163937	1.89	1.93
(1): 1998 instead of 1995				

Table 25: R&D Expenditure

R & D EXPENDITURE							
Indicator	**Unit**	**1991**	**1992**	**1998**	**1999**	**2000**	**2001**
R & D EXPENDITURE	**C£000's**	**4 835**	**5 578**	**10 783**	**12 417**	**14 068**	**15 832**
GDP Deflator		**1,039**	**1,061**	**1,023**	**1,021**	**1,040**	**1,063**
R&D Real terms		**4 654**	**5 258**	**10 541**	**12 161**	**13 529**	**14 891**
- as percentage of GDP	**%**	**0,18**	**0,18**	**0,23**	**0,25**	**0,26**	**0,27**
- by sector of performance	**C£000's**						
Government	"	4 002	4 665	6 052	6 131	6 553	7 194
Business enterprises	"	738	806	1 519	2 512	2 998	3 067
Higher education	"	6	10	2 690	2 982	3 486	4 137
Private non-profit	"	89	97	522	792	1 031	1 434
	Total	**4 835**	**5 578**	**10 783**	**12 417**	**14 068**	**15 832**
- by type of expenditure							
Labour costs	"	3 370	3 830	7 446	8 642	9 491	10 504
Other current expenditure	"	658	976	2 160	2 620	2 896	3 587
Capital expenditure	"	807	772	1 177	1 155	1 681	1 741
	Total	**4 835**					
- by field of science							
Natural sciences	"	978	1 101	3 235	4 319	4 818	6 065
Engineering and technology	"	628	711	714	917	1 158	1 447
Medical sciences	"	100	119	404	585	676	718
Agricultural sciences	"	2 548	2 800	3 700	3 634	3 883	3 667
Social sciences	"	332	505	1 507	1 672	2 154	2 513
Humanities	"	249	342	1 223	1 290	1 379	1 422
	Total	**4 835**	**5 578**	**10 783**	**12 417**	**14 068**	**15 832**
	1991	**1992**	**1998**	**1999**	**2000**	**2001**	
Natural sciences	20,23%	19,74%	30,00%	34,78%	34,25%	38,31%	
Engineering and technology	12,99%	12,75%	6,62%	7,39%	8,23%	9,14%	
Medical sciences	2,07%	2,13%	3,75%	4,71%	4,81%	4,54%	
Agricultural sciences	52,70%	50,20%	34,31%	29,27%	27,60%	23,16%	
Social sciences	6,87%	9,05%	13,98%	13,47%	15,31%	15,87%	
Humanities	5,15%	6,13%	11,34%	10,39%	9,80%	8,98%	
- by source of funds							
Direct government sector	"	3 928	4 610	5 901	6 304	6 770	7 602
Government university funds	"	0	0	2 063	2 206	2 592	2 771
Business enterprises	"	738	792	1 480	2 158	2 464	2 419
Higher education	"	0	0	75	228	266	470
Private non-profit	"	49	71	398	569	653	569
Abroad	"	120	105	866	952	1 323	2 001
	Total	**4 835**	**5 578**	**10 783**	**12 417**	**14 068**	**15 832**

Table 26: R&D personnel

R & D PERSONNEL	Head Count	n.a.	n.a.	1 292	1 520	1 630	1 733
Total	**Full-time Equivalent**	**341**	**366**	**564**	**681**	**680**	**690**
- by sector of performance							
Government	"	287	307	347	374	348	354
Business enterprises	"	47	51	77	135	145	144
Higher education	"	2	2	115	126	138	144
Private non-profit	"	5	6	25	47	49	48
	Total	**341**	**366**	**564**	**682**	**680**	**690**
- by gender							
Men	"	n.a.	n.a.	371	426	432	432
Women	"	n.a.	n.a.	193	256	248	258
- by occupation							
Researchers	"	135	147	237	278	304	333
Technicians	"	153	165	168	198	195	187
Other supporting staff	"	53	54	159	205	182	170
- by level of qualifications							
PhD degree holders	"	n.a.	n.a.	144	149	170	177
Post-graduate degree holders	"	n.a.	n.a.	73	90	96	116
University degree holders	"	n.a.	n.a.	64	108	105	104
Holders of other post secondary diplomas	"	n.a.	n.a.	26	35	36	40
Secondary education graduates	"	n.a.	n.a.	167	211	195	194
Primary education graduates	"	n.a.	n.a.	90	89	78	59
				564	682	680	690

Table 27. **R&D by Type of Expenditure**

%	1991	1992	1998	1999	2000	2001
Labour costs	69.70%	68.66%	69.05%	69.60%	67.47%	66.35%
Other current expenditure	13.61%	17.50%	20.03%	21.10%	20.59%	22.66%
Capital expenditure	16.69%	13.84%	10.92%	9.30%	11.95%	11.00%

Table 28. **Distribution of the Employees Involved in R&D Activities**

	1991	**1992**	**1998**	**1999**	**2000**	**2001**
Researchers	39.59%	40.16%	42.02%	40.91%	44.56%	48.26%
Technicians	44.87%	45.08%	29.79%	29.03%	28.68%	27.10%
Other supporting staff	15.54%	14.75%	28.19%	30.06%	26.76%	24.64%
Total full time employees (head)	341	366	564	682	680	690

Table 29**. Telecom and Computer market size (in EURO million)**

	1996	**1997**	**1998**	**1999**	**2000**
Telecom market size	175	200	267	293	238
Computer market size	49.2	55.6	62	67.4	80

Table 30. **Ratio of primary and secondary schools and highs schools and universities with web-site**

	Total Number of Institutions	**Institutions with web-site**	**Web-sites/total number institution**
Primary and secondary schools	428	24	5.6%
High schools and universities	53	20	37.7%

Table 31. **Development of IS in the Cypriot government**

	Total Number of Population	**Total Number of Population**	**Web-sites/total number of population**
National Ministries	11	11	100%
Regional and local authorities	N/A	11	N/A
Hospitals/clinics	131	29	7.6%
Museums	37	10	11%
Libraries	124		0.8%
Total	817	99	

Table 32. **Evolution of WWW indicators over the ESIS II Period**

	Jul-99	Oct-99	Jan-00	Apr-00	Jul-00	Oct-00	1-Jan
Primary and secondary schools	0.50%	3.50%	4.70%	4.90%	5.60%	5.60%	5.60%
High schools and universities	23.00%	22.60%	30.20%	30.20%	37.70%	37.70%	37.70%
National Ministries	100.00 %	100.00 %	100.00 %	100.00 %	100.00%	100.00 %	100.00 %
Regional and local authorities	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hospitals/clinics	0.80%	0.80%	4.60%	6.10%	7.60%	7.60%	7.60%
Museums	11.00%	11.00%	11.00%	11.00%	11.00%	11.00%	11.00%
Libraries	0.00%	0.00%	0.00%	0.80%	0.80%	0.80%	0.80%

Table 33. **Number of telephone lines**

	1996	1997	1998	1999	2000
Total number of conventional lines	366363	386014	404710	422037	440091
Total number of 64k ISDN lines	0	3146	9110	15938	33906
Total number of mobile phone lines	10781	91968	116429	143726	195835
Total number of lines	377144	481128	530249	581701	669832

Table 34. Household telephone line penetration rates

	1996	1997	1998	1999	2000
Total number of conventional lines	56.5%	59.0%	61.3%	62.9%	64.8%
Total number of 64k ISDN lines	0.0%	0.5%	1.4%	2.4%	4.9%
Total number of mobile phone lines	1.7%	14.1%	17.6%	21.4%	28.8%
Total number of lines	58.2%	73.6%	80.3%	86.7%	98.5%
(per 100 inhabitants					

Table 35**. Penetration rates for ICT tools**

		1996	1997	1998	1999	2000
Telephone sets	Installed Base	444000	566000	624000	850000	
	Penetration Rate	68.5%	86.5%	94.5%	126.7%	
Public pay phones	Installed Base	2025	2045	2047	2250	2700
	Penetration Rate	3.1	3.1	3.1	3.3	4
Fax machines	Installed Base	1994	NA	NA	1085	
	Penetration Rate	3.1	NA	NA	0.2	
Modems	Installed Base	7000	NA	NA	33,900	60000
	Penetration Rate	10.8	NA	NA	50.5	
Pagers	Installed Base	5534	4767	4038	3278	2528
	Penetration Rate	8.5	7.3	6.1	4.9	3.7

Table 36. **PC penetration rates**

	1998	**1999**	**2000**
Total number of home PC's	37000	64800	130600
Total number of business PC's	57000	69400	92000
Total number of PC's	94000	134200	220600
Total number of home PC's/100 inh.	5.6%	9.7%	18.2%
Total number of business PC's/100 inh.	8.6%	10.3%	12.9%
Total number of PC's/100 inh.	14.2%	20%	30.6%

Table 37. **Total Internet Use and Penetration Rate**

	2001	**2002**
Internet Users	120000	150000
Penetration Rate	16.8%	21%

Table 38. **Voice telephony tariffs (2000)**

Voice Telephony (in Euro)	
Monthly Access Charge	2.87
Installation	24.27
Connection	24.27
Monthly Rental	2.17
Local Call (per min)	0.0056
Domestic Call (longest distance) (per min)	0.0537
International neighboring country (per min)	0.3467
International Belgium (per min)	0,5201
International USA (per min)	0.6934
International Basket (per min)	0.42

Table 39**. Mobile telephony tariffs (2000)**

Mobile Telephony (in Euro)	
Connection Fee	43.84
Monthly Rental	17.54
National Calls (lowest)	0.0719
National Calls (highest) (per min)	0.1
International Calls Belgium (per min)	0.4349
International Calls USA (per min)	0.6314
International Calls Basket (per min)	0.8067

Table 40. **Population by age groups, 2002**

Population by age groups (%), 2002	%
0-14 years	21,5
15-64 years	66,8
65+ years	11,7