

**Microeconomics of Competitiveness: Firms, Clusters and Countries**  
**Professor Michael Porter**

**Armenian IT Cluster**

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May 5, 2006  
Boston, MA

## Content

<b>CONTENT .....</b>	<b>1</b>
<b>1.1. COUNTRY BACKGROUND .....</b>	<b>2</b>
<b>1.2. CHALLENGES OF THE TRANSITION PERIOD .....</b>	<b>3</b>
<b>1.3. ECONOMIC STABILIZATION AND RECOVERY .....</b>	<b>4</b>
<b>CHAPTER 2. NATIONAL DIAMOND ANALYSIS .....</b>	<b>7</b>
<b>2.1 CONTEXTS FOR FIRM STRATEGY AND RIVALRY .....</b>	<b>7</b>
<b>2.2. FACTOR CONDITIONS .....</b>	<b>9</b>
<b>2.3. DEMAND CONDITIONS.....</b>	<b>11</b>
<b>2.4. RELATED AND SUPPORTING INDUSTRIES .....</b>	<b>11</b>
<b>CHAPTER 3: IT CLUSTER .....</b>	<b>11</b>
<b>3.1. HISTORICAL EVOLUTION.....</b>	<b>11</b>
<b>3.2. ANALYSIS OF THE IT CLUSTER.....</b>	<b>13</b>
<b>3.3. CLUSTER LINKS.....</b>	<b>15</b>
<b>3.4. IT CLUSTER DIAMOND .....</b>	<b>17</b>
<b>3.4.1. Factor/Input conditions .....</b>	<b>17</b>
<b>3.4.2. Demand Conditions.....</b>	<b>19</b>
<b>3.4.3. Context for Firm Strategy &amp; Rivalry.....</b>	<b>20</b>
<b>3.4.4. Related and Supported Industries.....</b>	<b>20</b>
<b>CHAPTER 4. IFCS AND DONOR PROGRAMS.....</b>	<b>21</b>
<b>4.1. INSTITUTIONS FOR COLLABORATION (IFC).....</b>	<b>21</b>
<b>4.2. ASSESSMENT OF MAJOR DONOR PROJECTS.....</b>	<b>22</b>
<b>CHAPTER 5: MAJOR CHALLENGES AND POLICY RECOMMENDATIONS .....</b>	<b>23</b>
<b>5.1. CHALLENGES TO CLUSTER DEVELOPMENT .....</b>	<b>23</b>
<b>5.2. POLICY RECOMMENDATIONS .....</b>	<b>24</b>
<b>5.2.1. Recommendations at National Level.....</b>	<b>24</b>
<b>5.2.2. Cluster Specific Recommendations .....</b>	<b>25</b>
<b>BIBLIOGRAPHY AND DATA SOURCES USED .....</b>	<b>27</b>
<b>EXHIBIT 1: NATIONAL DIAMOND .....</b>	<b>28</b>
<b>EXHIBIT 2. IT CLUSTER DIAMOND .....</b>	<b>29</b>
<b>EXHIBIT 3-INSTITUTIONAL ARRANGEMENTS ON IT CLUSTER- .....</b>	<b>30</b>

## **Chapter 1. Armenian History and Economy**

### ***1.1. Country Background***

Armenia is a small, landlocked country in the Caucasus region neighboring Georgia, Turkey, Iran and Azerbaijan. It covers an area of 29,800 square kilometers most of which is mountainous. Only 3 million Armenians live in the country but about two times this number make the *Armenian Diaspora*, with the largest populations located in Russia, USA, and France. Armenia prides itself on being the first state to recognize Christianity as a state religion back in 301 A.D.

For centuries Armenia lost its statehood and was ruled by various empires, the last one being the Ottoman Empire of Turkey. About 1.5 million Armenians are believed to have been killed during the genocide perpetrated by Ottoman Turks during the First World War in early 20<sup>th</sup> century. Following a short independence period from 1918-20, Armenia was incorporated into the Soviet Union in 1921 becoming one of the USSR's 15 republics. The 70-year period of Soviet ruling that followed the Armenian genocide was a period of national and cultural recovery and country rebuilding.

The Soviet Union's strong focus on education and science, especially during the post World War II period, allowed Armenia to strengthen its educational base, establish scientific research institutions, and develop its industrial sector. The soviet economy was highly integrated with industrial institutions scattered over the country and dependent on each other. In the value chain of the Soviet system, Armenia was given the role of manufacturing base for high-value added electronic components and complex industrial

products. As a consequence, the country's manufacturing base became fragmented after the break-up and severance of economic ties with the Soviet Union in 1991.

### ***1.2. Challenges of the Transition Period***

- *Earthquake of 1988.* On December 7, 1988, a major earthquake struck the northern part of the country killing more than 25,000 people and affecting 1/3<sup>rd</sup> of the territory. Armenia was left with the challenge of reconstructing the country and finding housing for millions of people.
- *Escalation of Nagorno-Karabakh Conflict.* The Nagorno-Karabakh territory largely occupied by Armenians had been given under the control of Azerbaijan under Soviet Rule by the state. The independence of Azerbaijan and Armenia increased the tensions around the disputed territory escalating into a full fledged war from 1991 to 1994 resulting in thousands of deaths and about one million refugees on both sides.
- *Blockade by Turkey.* Bad relations with Turkey over the issue of the Armenian Genocide, combined with the new conflict with ethnically Turkish Azerbaijan, resulted in the closure of the border with Turkey. This put Armenia in an effective blockade, since the other two routes to the external world -through Georgia and Iran- were also unstable and costly.
- *Energy Crisis and Economic Downturn.* Early years of the Armenia's independence were characterized by a major energy crisis arising from the closure of the largest nuclear power plant of the region. When this issue was combined with Armenia's high dependence on imported oil and, with the de-facto

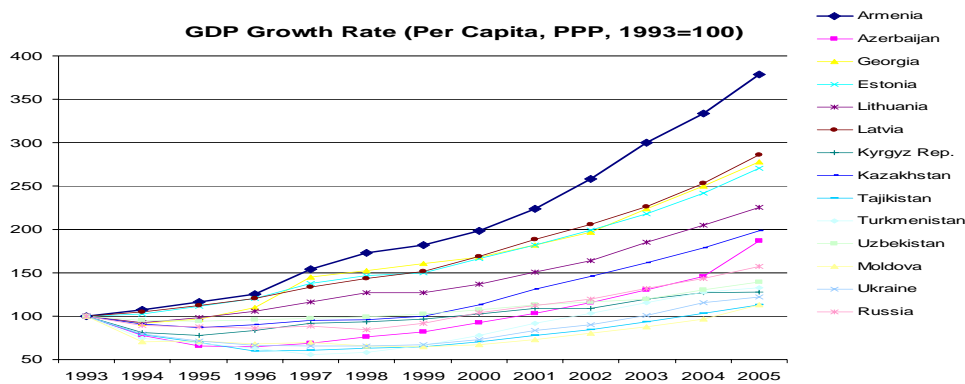
geographical blockade, the consequence was a major economic contraction.

Armenia faced serious macroeconomic instabilities during the early years of independence, with hyperinflation and high unemployment rates.

### 1.3. Economic Stabilization and Recovery

In November of 1993, the government of Armenia embarked on an ambitious macroeconomic stabilization and economic liberalization program that was supported by several Structural Adjustment Programs of the World Bank and the IMF. Armenia was the first country in the former Soviet Union that privatized land and a major block of SOE's. The economy was liberalized and all restrictions on the movement of capital and income repatriation were removed.

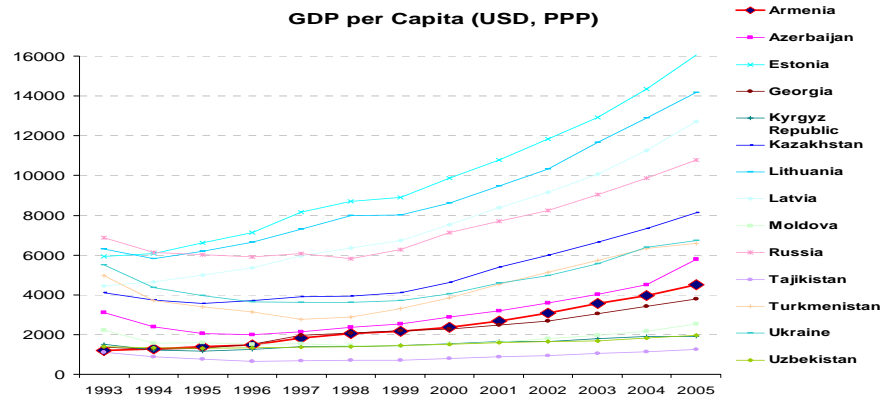
Figure 1. GDP Growth Rate in Armenia and other former Soviet Union Republic.



Source: Economic Intelligence Unit.

The economy showed signs of recovery for the first time in 1994, when GDP grew by 5.4%. From that time on, Armenia has been the fastest growing country in terms of the GDP per capita in the region (See Figure 1). However, in absolute terms, Armenia's GDP remains low (see Figure 2).

Figure 2. GDP per Capita of Armenia and other Regional Countries



Source: Country Data from EIU.

The share of agriculture in GDP decreased steadily during the period 2001-2005 while the contribution of the construction sector almost doubled, reaching 20% of the GDP in 2005. Major projects were funded by the Armenian Diaspora and largest among these, was the funding from the Lincy Foundation of the Armenian-American billionaire Kirk Kirkorian, which supported schools rehabilitation, roads and other social infrastructure.

In Table 1, selected economic and social indicators are summarized. From

Figure 3: Composition of Armenian GDP (2001-2005)

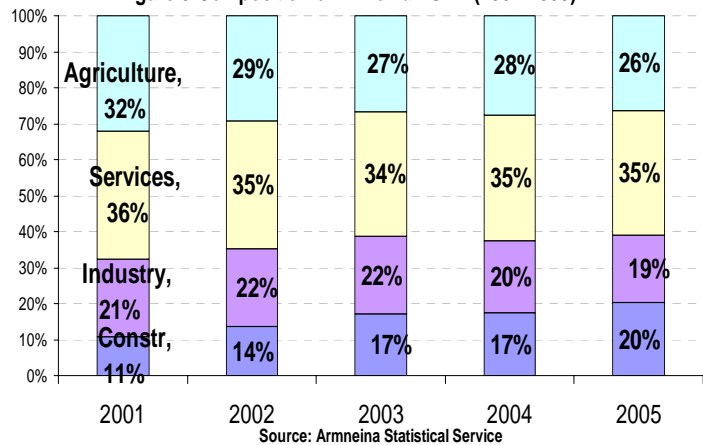
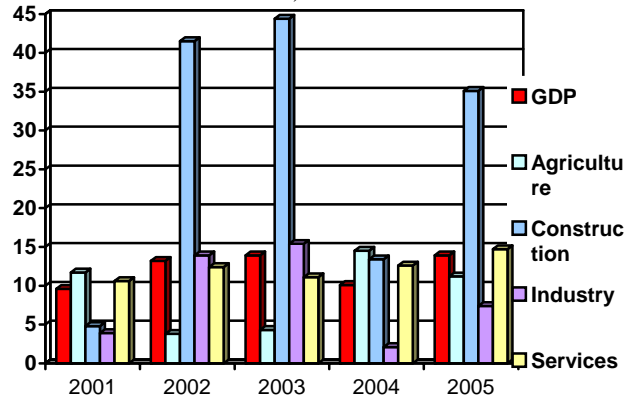


Figure 4: GDP growth rates by sectors (2001-2005)



the information, it becomes evident the country's increased attention to the area of budgetary spending on education, social sectors, and corruption. The unresolved conflict over the Nagorno-Karabakh continues to exert pressure on Armenia's budget.

Table 1: Selected Economic and Social Indicators

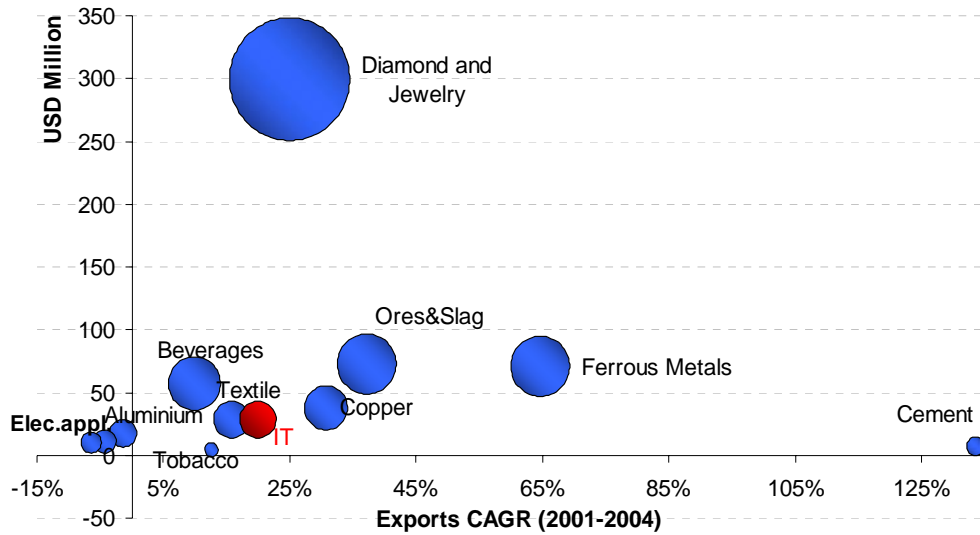
	Armenia	Europe and Central Asia (average)	Latvia
FDI Stock,% of GDP (2004)	28.3	20.2 (CIS)	32.9
Gross Capital Formation,% of GDP	24	23	29
Life Expectancy at Birth (2003)	75	68	71
Mortality Rate (2003)	33	36	12
Public Spending on Education (% of GDP, 2002)	3	4	6
Corruption,% of managers considering major problem	14	NA	12
Electric power consumption, (kwh percapita	1,113	2,813	2,088

Source: World Development Indicators

A positive economic indicator is the growth of FDI stock as a percentage of GDP. Armenia's favorable tax regime grants equal treatment to foreign and domestic companies, no export duties, and restrictions on foreign ownership and profit repatriation. The Law on Foreign Investment protects from changes in the regulatory framework for up to five years.

The increase in exports over the past five years has been primarily driven by commodities (Figure 6). The main export industry is the processing of diamonds and stones for jewelry uses. This is primarily due to existence of qualified labor, a special agreement with Russia of a yearly quota for raw diamond materials, and the existence of major international players based in Armenia, namely the Lev Leviev Group. IT exports are have been growing at an annual compounded rate of 20% over the past five years however, they still represent a small fraction of the total exports revenue.

Figure 5: Armenian Exports CAGR (2001-2004)



Source: Dara from Armenian Statistical Service; IT data calculated from McKinsey Quarterly Report on IT cluster and EIF (2003)

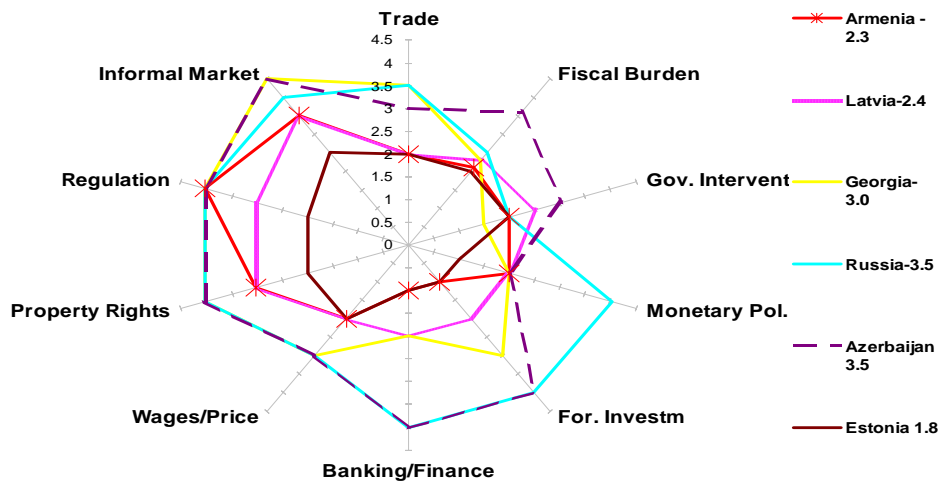
## Chapter 2. National Diamond Analysis

### *2.1 Contexts for Firm Strategy and Rivalry*

- *Free economic environment.* According to the Heritage Foundation's annual rating of the Economic Freedom Index, in 2006, Armenia was ranked 27<sup>th</sup> in the world in terms of its economic freedom. This is well above to other countries of the Commonwealth of Independent States and even many developed economies, such as Norway (30), Italy (42) and France (44) (See Figure 6).
- *Existence of supportive Diaspora.* The Armenian Diaspora has strong links with its homeland and is involved in activities ranging from humanitarian assistance to direct business initiatives.
- *Absence of restrictions on foreign ownership and profit repatriation.* The Armenian authorities have adopted liberal policy in terms of foreign ownership of local assets and have eliminated any constrains for profit and capital repatriation.



Figure 6. Components of the Economic Freedom Index for 2006 for selected countries.



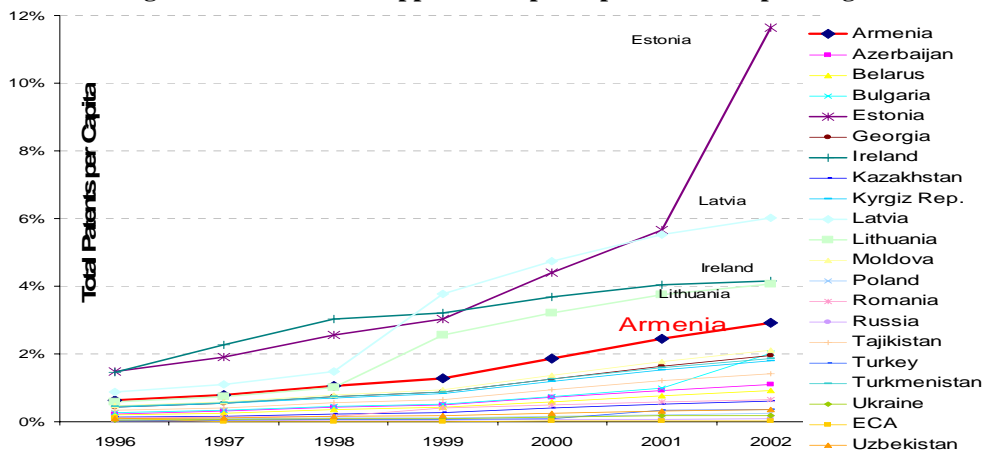
Source: Data from Heritage Foundation, 2006.

- *Geographic location and political risks.* As discussed previously.
- *Corruption, lack of judicial independence.* Corruption and weak judicial and law enforcement institutions have a negative impact for attracting FDI and the development of a competitive and healthy private sector.
- *Ineffectiveness of antitrust policy and existence of Oligarchs.* Various studies suggest that there is lack of real competition in many lucrative sectors in Armenia<sup>1</sup>. Existence of a small group of oligarchs in the Armenian economy - with close links to the government- create a favorable environment for the extraction of monopolistic profits in several sectors, including, petrol, sugar, cooking oils, and others. Despite the existence of a Government Commission for Competition Protection, there is no effective protection.

<sup>1</sup> “Issues Related To Promoting A Competitive Business Environment In Armenia”, Paul Holden and Vahe Sahakyan, Working Paper, Armenia Policy Research Group, Washington, DC.  
<http://armpolicyresearch.org/Publications/WorkingPapers/pdf/WP0510.pdf>

- *Ineffective tax and customs systems.* With widespread corruption, it poses a serious threat to the national context for firms' rivalry and competition.
- *Ineffective IP protection.* Armenia has complete set of legislation for the protection of intellectual property rights. However, the enforcement of these rights is not effective and has a negative impact on the national diamond conditions. The number of applications for patents and innovations show a very innovative and creative environment (Figure 7.)

**Figure 7: Total Patent Applications per capita in a Group of Regional Countries.**



Source: Data from World Development Indicator (2005)

## 2.2. Factor Conditions

Armenia has one of the highest literacy rates in the world and there is a natural aptitude for sciences in the population. In combination with relatively low wages, this makes Armenia's value proposition quite attractive. In addition, there is a number of donor and Diaspora funded projects that allow Armenian students to continue studying abroad under the promise of returning to the country after completing their studies.

- *Entrepreneurial skills and spirit.* Despite the 70-year oppression of entrepreneurial spirit during Soviet times, Armenians have been historically

known for their natural drive for entrepreneurship, commerce and their desire to create own businesses. The transition to a market economy provided an opportunity for people to freely employ their abilities.

- *Reliable electricity supply.* Successful restructuring of the electricity sector and privatization of the distribution network is considered as one of the success stories in Armenia<sup>2</sup>.
- *Lack of marketing and management skills.* While the focus on natural sciences has been a positive legacy of Soviet Union, lack of marketing and management skills can be regarded as the negative legacy of the past.
- *High transportation costs.* As mentioned above, Armenia's landlocked status and absence of diplomatic relations with two of its four neighbors makes the country's access to the outside world limited.
- *Lack of natural resources.* Armenia has very limited natural resources however, in the long run this may turn out to be an advantage as the country seeks to develop higher value-added and knowledge-based industries.
- *Costly telecommunications.* Armentel, a local telecommunications company controlled by Greek Hellenic Telecommunications Organization was granted a fifteen year monopoly in 1998 on fixed lines, cellular and "last mile" internet services till 2013<sup>1</sup>. As a result, Armenians have had to cope with poor quality and high cost telecommunication services. Following Armentel's failure to make committed investments, the Government granted license to a second cellular company in 2005.

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<sup>2</sup> "Issues Related To Promoting A Competitive Business Environment In Armenia", Paul Holden and Vahe Sahakyan, Working Paper, Armenia Policy Research Group, Washington, DC.  
<http://armpolicyresearch.org/Publications/WorkingPapers/pdf/WP0510.pdf>

### ***2.3. Demand Conditions***

- *Small local market.* A current GDP level of \$5 billion, low income (GDP per capita of \$1,640 in 2005) and, a small population, implies that in the foreseeable future the domestic market will remain a hindrance to Armenia's growth.
- *External demand and regional integration.* Unfavorable geographical location and high transportation costs limit the prospects for exporting products of any significant weight and volume.
- *Buyer sophistication.* Buyer sophistication remains relatively low and is directly related to the prosperity of the country. The transition period produced high level of inequality with small proportion of relatively wealthy people who chose to make their major purchases abroad.

### ***2.4. Related and Supporting Industries***

The active institutions for collaboration (IFC's) include the National Chamber of Commerce, Union of Entrepreneurs, Union of Banks, and other similar associations that provide a framework for effective collaboration between various players in the public, private sectors and the civil society.

## **Chapter 3: IT Cluster**

### ***3.1. Historical Evolution***

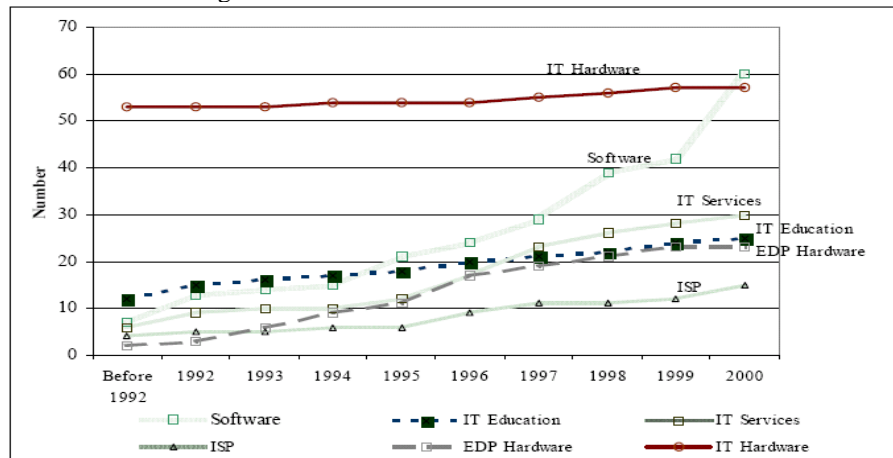
Armenia was the IT hub of the USSR. The Soviet Government established research institutes in the region back in 1956 when the Yerevan Scientific Research

Institute of Mathematical Machines (YSRIMM) was founded. The Institute of Informatics and Automation Problems (IIAP) was established under the National Academy of Sciences (NAS) in 1957.

After gaining independence in 1991 a large part of the population left the country and many of the research and production centers were closed having lost their customers and state sponsorship. The IT industry went into oblivion while thousands of highly qualified professionals were left jobless.

While the country regained some of its economic stability, the efforts of the local entrepreneurs in the IT sector expanded as some of the successful initiatives turned into small companies. Executives of Armenian companies belonging to the Diaspora started giving Armenian companies software outsourcing contracts due to the country's cheap labor, low operating costs, and the presence of high quality skilled professionals. Soon after, foreign companies began establishing small development centers in Armenia laying the foundation for an Information Technology cluster in the capital city, Yerevan.<sup>3</sup>

Figure 8: Evolution of Various IT Services



Source: USAID Report.

<sup>3</sup> Enterprise Incubator Foundation (2004), "Armenian Information Technology Sector, Software & Services".

The software product range of these companies included data base management systems, web-designing, multimedia and educational courses, software systems and utilities, customer support software and others. Most of the foreign companies operated in the software sector and were mostly US-based like HPL Technologies (1995), Boomerang Software (1997), Credence Systems (1999), Epygi Technologies, LEDA Design, Virage Logic (1999), Synergy International Systems (1999). Along with software, companies also starting entering into IT education, IT services, Internet Services and Electronic Data Processing Hardware.

In 1996, the Center for Development, Innovation and Technologies (CEDIT) was founded in Yerevan. Within two years of its operations, CEDIT received a major order for developing testing programs from Ingram-Micro (USA). This event introduced the Armenian IT industry to the US market.

### ***3.2. Analysis of the IT Cluster<sup>4</sup>***

By 2002, the IT sector's share of GDP was at 1.71%. There were a total of 110 firms in the industry; 85 were local firms while 25 were subsidiaries of foreign companies. The sector employed a workforce of about 3000-3500 professionals which represents 0.2% of the total workforce. About 70% of these were IT specialists while 30% were management and other personnel. Only 6% of the companies employed 100 or more specialists while 76% had less than 25 employees. Almost all the foreign firms were subsidiaries of the Armenian Diaspora owned companies in the West with 62% of

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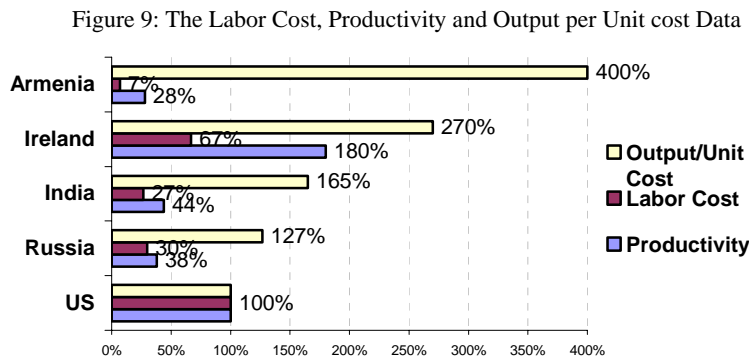
<sup>4</sup> The facts and figures in this section were obtained from the EIF report 2004 quoted in the bibliography.

the foreign firms having US ownership, followed by 17% Russian/CIS and 17% European ownership.

On average, domestic companies employ 17 people while foreign companies employ 35. About 70% of the workforce was concentrated in the services segment of the industry. The local companies operate mostly in the internet related areas like web design and development, internet applications, provision of internet services, computer graphics and multimedia and mainly cater to the local market. The majority of foreign companies deal in customized software development and outsourcing, chip design and testing and networking systems and communications and export almost all of their products.

The salaries paid to IT professionals are currently very low with an average of about \$6000 USD paid by local companies and about \$14,000 USD by foreign companies.

The productivity of the Armenian IT sector is assessed at 28% of the PPP adjusted U.S. productivity level, and is lower than that of countries like India and Ireland (Figure 9). But at the same time, Armenia has a great advantage relative to these countries in terms of the unit labor cost which is only 7% of that in the U.S.



Source: Data from McKinsey Armenia 2020 Report, EIF Report. Calculations done by the authors.

In 2003, the Armenian IT sector generated around \$38m USD which shows a growth rate of 30% in comparison with a turnover of USD 10 millions in 1998. Of this, \$13.5 million were generated from the local market and \$24.2 were generated from exports. The largest share of exports i.e. 68% went to the United States and Canada, 16% went to Russia and CIS countries and 10% went to Europe. Chip design and testing constituted the largest share of this revenue at 22.9% followed by internet services at 14.4% and networking systems and communications at 13.8%.

### ***3.3. Cluster Links***

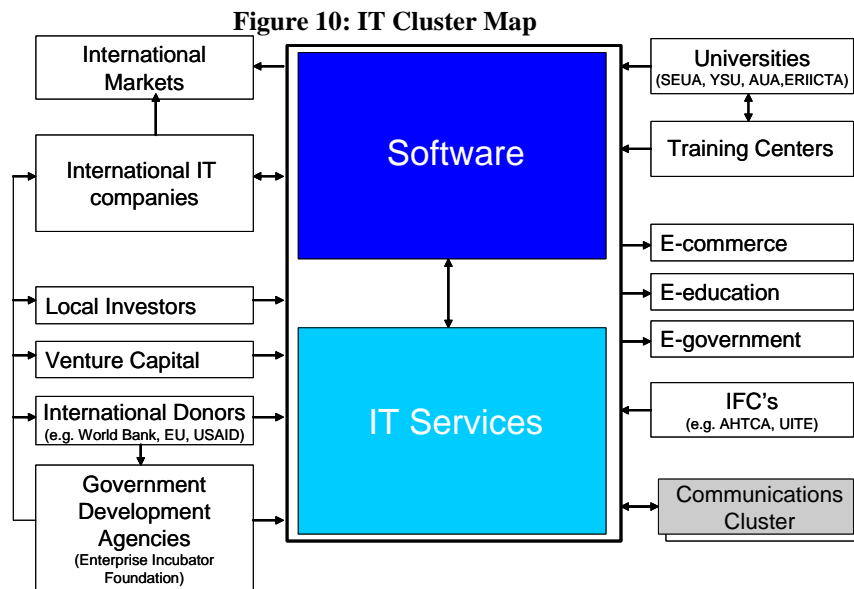
The sustained growth of Armenia's IT industry is increasingly attracting new players helping to fill the voids that are needed to serve business needs. The international market for the cluster products has been expanding, there are more users within the domestic market for applications and programs, new investors -mostly from abroad- are capitalizing on the opportunity, educational institutions are increasingly adapting their courses and programs to the needs of the industry, and the government has played a useful role by being pro-active in favor of the industry through several initiatives.

Nonetheless, the cluster is still thin in some areas (i.e. training providers, certifiers, specialized packaging firms, marketing specialists) and better coordination between firms, associations, and government agencies is required for the cluster to move from infancy to the next stage.

Figure 10 shows the key links between the different parties in the cluster. At its core lie software development and the provision of specialized IT services. Currently, there is no one specialization within the cluster that represents a higher market share than



that for web design services at 15%, and which in turn suggests that there is room for significant consolidation as the industry matures.



Foreign direct investment (FDI) has been critical for the industry because it provides knowledge, depth, awareness of Armenian capabilities, and key access to international markets for Armenia’s IT products, currently the lifeline of the cluster.

Because of the limited marketing skills of the domestic owned firms, these still rely on foreign companies to promote their products abroad. This needs to change in order to create international awareness of these firms ability to produce high quality products and services. The sector as a whole and the companies in particular, need to reinforce their efforts in this area: the “Made in Armenia” concept needs to become a synonym for reliability, innovation, and quality when it comes to IT.

While the sources for funding new projects and start-up companies in the IT sector remain limited, some strides have been made through the initiatives of international donors such as USAID, the World Bank, and the EU. These efforts are

currently complementing the scarce domestic funding but, in order for Armenian companies to compete internationally, the industry needs access to venture capital to ensure growth during the key stages of creation and ramp-up.

The two largest educational institutions, Yerevan State University (YSU) and SEUA have traditionally being the leaders in providing IT education, but the growth of the industry has attracted new educational institutions like the American University of Armenia (AUA) and the European Regional Institute of Information and Communications Technology in Armenia (ERIICTA), widening the choices available for students while increasing the pool of IT professionals.

In order to improve the matching of the skills provided by the educational institutions with those required by the industry, some companies have set up joint programs with educational institutions. Such is the case of the Internet Technologies Research and Training Center established at SEUA under a joint agreement between EIF, SEUA and Lycos-Armenia.

### ***3.4. IT Cluster Diamond***

#### **3.4.1. Factor/Input conditions**

*“Natural” Talent.* Armenia has a set of positive factors that buttress the sustained performance of the IT cluster. Of these, the most important is the wide pool of talent emerging from the institutions of higher education, particularly from YSU, SEUA and AUA. The joint cooperation agreements established between the IT companies and the educational institutions guarantee that the skills that are currently being taught correspond to those required by the industry.

*Low Wages.* Currently, at the intersection of a talented work force with low wages lies the main attraction for the foreign IT companies that invest in Armenia. But as wages rise, increased productivity stemming from higher levels of education / specialization should become the new driver that maintains the interest of foreign investors in the sector.

- *Brain Drain.* However, there are still some constraints that limit the adequate development of the cluster and some risks that could jeopardize its survival in the future if some issues are not addressed promptly. Some of these relate to the fact that a significant number of qualified Armenians prefer to migrate to the West once they obtain their diplomas. It is possible that once the industry becomes more specialized and productive, wages will rise and then, the retention rate will also improve.
- *Poor financing.* The lack of venture capital for start-up companies and IT projects in Armenia presents an obstacle for nurturing innovation and entrepreneurship. Bank credit is usually inadequate for IT projects as the banks request for collateral during the creation and ramp-up phase makes borrowing a risky proposal plus, the industry cannot rely indefinitely on the availability of financing coming from private development foundations or from family funds. Some initiatives in the direction of establishing local venture funds are currently being pursued by the EIF.
- *Monopolies and cronyism.* Armantel's monopoly on some key areas of the telecommunications industry remains a source of frustration that translates into

higher costs, inefficient provision of services, and less competitiveness -and is not limited to this sector.

### **3.4.2. Demand Conditions**

- *Strong international demand.* The strong demand in the world market for IT sector products has fueled the healthy growth rate of Armenia's IT industry during the last decade.
- *Domestic improvement.* Exports still account for about 75-80% of all of the cluster's sales but the domestic market is increasingly absorbing more products and services. In 2004, sales in the domestic market rose to \$15.8m USD, out of which \$11.9m USD were produced by domestically owned companies<sup>5</sup>.
- *The Diaspora connection.* The IT companies owned by the Armenian Diaspora continue to provide the most visible and effective channel for marketing Armenian made products abroad. This factor plays both a positive and negative role. In the case of the former, because it provides a loyal conduit for the industry's products, a reliable source of funding, and complements the deficient marketing skills and international *know-how* of Armenian firms. In the case of the latter, because by performing these functions on behalf of the industry, the local companies remain too dependent by neglecting the need to cultivate some of these abilities themselves.
- *More users, wider markets.* The wide number of initiatives put forward by the government (e-government, e-visa, e-society) along with some other private

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<sup>5</sup> Manuk Hergnyan and Gagik Gabrielyan, The Story of the Emerging IT Cluster in Armenia, December 2005, Economy & Values Research Center, Yerevan, Armenia.

proposals, will help to jump-start a wider use of the internet and IT technology within society. Internet penetration is still low compared to other countries and Armenian's are still to become a more sophisticated set of consumers, but there is a reasonable case for hope as more ISP's enter the market and a larger share of the population gains access to the use of IT.

### **3.4.3. Context for Firm Strategy & Rivalry**

- *Lack of focus.* Because the industry is still in its early stages, the dynamics that will define the shape that this cluster will take on the face of consolidation and competition are still in flux. The Armenian IT sector is still too fragmented into various specializations without a clear pattern emerging yet from it (see Fig. 2). Currently there's a large number of companies specializing in a wide spectrum of activities.
- *Poor telecoms.* Armantel's monopoly decreases the attractiveness of the cluster and affects the overall competitiveness of the industry.
- *Critical Mass.* New entrants continue to provide critical mass to the core of the cluster, and with it, awareness and, more incentives for other firms and individuals to establish both within and around it.

### **3.4.4. Related and Supported Industries**

Related and Supported industries for IT Cluster are discussed in detail in the following chapter.

## **Chapter 4. IFCs and Donor Programs**

### ***4.1. Institutions for Collaboration (IFC)***

Private companies of the IT sector have been active in forming various forms of IFCs to coordinate efforts towards the cluster development, initiate and implement joint projects, and support each other on various stages of their development.

**The Union of IT Enterprises (UITE)** was established in 2000 uniting IT companies of the country. This has helped the companies to present a single voice in their discussions with the government and coordinate their efforts in various areas, including in developing educational and training programs and international cooperation.

**The Armenian High Tech Council of America (ArmenTech)** formed in Massachusetts, USA in 2000 to support and promote technology based businesses in Armenia. This is one of the most successful Diaspora initiatives in the area of IFCs.

**The IT Development Support Council (ITDS Council)** was established in 2001 in the Prime Minister's office, that comprised representatives of public and private sector, as well as research and education institutions. The Council meets regularly and addresses the major issues that hinder the development of the cluster. It also serves as a bridge between the government, private sector and international donor community.

**The Enterprise Incubator Foundation** established in 2002 provides business services for start-ups and creates worldwide opportunities for partnerships and investment for Armenian IT companies. The effectiveness of IFCs in developing the IT cluster lies in strengthening the components of the diamond model. These included collaboration with educational institutions for industry specific curriculum, enhancing the marketing,

management and business communication skills of cluster companies for entering international markets, mobilizing and channeling financial resources for IT companies, development of an IT vision for the future development of the industry: **brand identity for the Armenian IT firms** and securing government cooperation for stimulating demand and increasing competition in the industry.

#### ***4.2. Assessment of Major Donor Projects***

- **World Bank.** The World Bank (WB) is the largest donor of the country. The Enterprise Incubator Project was launched with a five million dollar credit from the World Bank. It provides start-up companies with the initial support in establishing their businesses, trainings and marketing.
- **US Government.** The United States Agency for International Development (USAID) is another important donor for Armenia. Since independence the U.S. government has provided about \$1.7 billion in assistance, that makes Armenia one of the largest per capita recipients of US aid. In March 2006 a new program of assistance of about \$ 234 million was approved by the U.S. Millennium Challenge Corporation. The USAID portfolio includes a major project titled Competitive Armenian Private Sector Project, that aims at developing competitiveness of the Armenian private sector enterprises through capacity building and providing marketing skills.
- **European Union/TACIS.** European Regional Institute of Information and Communication Technologies in Armenia (ERIICTA) was established with the support of the European Union (EU) which takes care of the education and

continuous training of the Armenian IT experts. The EU has also supported various small e-governance projects, including the second in the world e-visa initiative.

- **DFID, UNDP** and some other donors have been supporting Armenia in various regional e-Governance initiatives.

In general, the effectiveness of all donor projects needs to be improved through better coordination of donor projects and harmonization with government policy and priorities through development of a National IT Development program, clear project objectives and accountability for results and performance of each donor project, and need-specific training instead of general programs.

## **Chapter 5: Major Challenges and Policy Recommendations**

### ***5.1.Challenges to Cluster Development***

- *Legislation & Corruption.* The absence of the rule of law, weak government enforcement, lack of transparency, accountability and openness in the public sector has created favorable conditions for the growth of corruption in the public sector. Weak IP protection and antitrust legislation are also deterrents to the flow of FDI.
- The Armenian government, with the support of the World Bank has developed an Anti-Corruption Strategy (2003), which has not improved the situation. Various business surveys and Transparency International's Corruption Perception Index still suggest the existence of rampant corruption in the country.



- *Political Climate and Communication Links.* Another major challenge for the country remains the unresolved conflict with Azerbaijan and tense relations with Turkey. Armenia pays high costs for transportation, which makes it uncompetitive compared to other countries.
- *Weak local demand.* At least 29% of the population in Armenia is below the poverty line. Failure to address the issue of poverty may increase the social tensions and can create political instabilities. The widespread poverty keeps the local demand low and does not let the buyer sophistication grow.
- *Factor loss and costs:* The brain drain from the country and mandatory military service affects the availability of skilled workforce for the growth of the cluster. This will result in increasing the cost of labor due to the shortage of professionals.

## ***5.2. Policy Recommendations***

Based on the above analyses, the following issues can be highlighted as the major areas for improving the business environment and competitiveness at both national, as well as the cluster levels.

### ***5.2.1. Recommendations at National Level***

- ✓ Liberalization of the telecommunication market through renegotiation of the ArmenTel agreement.
- ✓ Addressing the issue of corruption and strengthening the rule of law. The country needs to start a real fight against the corruption, and do it on a sector by sector basis.

- ✓ Promoting competition, innovation and better protection of property rights.  
Establishment of special investigative agency within the existing Agency for Intellectual Property Rights that can take on some enforcement functions. Broader public education campaigns should be organized to educate the population about the need of the IP protection and the real long term benefits for the Armenian economy.
- ✓ Supporting companies to develop business management skills, particularly in marketing at the international level. The government may want to take on more active role in the implementation and coordination of various donor projects that would provide them possibility to increase the existing projects' effectiveness in addressing some of these issues.

#### *5.2.2. Cluster Specific Recommendations*

- ✓ **Identifying and focusing on specific higher value-added sub-sector and product markets.** This is important particularly in light of the limited labor force and small local market that does not allow to effectively competing with other countries across the whole range of products and services.
- ✓ **Strengthen the IT educational programs in universities in line with business needs.** The government and private sector need to work together to further enrich and expand the existing educational programs in IT area, including the establishment of regional IT training and lab centers outside of Yerevan.
- ✓ **Promoting the e-Armenia image.** It is important to build on the successful projects and products (such as the e-Visa), and use better the Diaspora to create an

e-Armenia image throughout the world. Attraction of well known international IT companies would help a lot in this effort.

- ✓ **Improving the effectiveness of donor programs** through more active government involvement and coordination. There are many ongoing donor programs that are not well utilized and which have limited impact on the ground.
- ✓ **Encouraging regional collaboration and exploring opportunities in neighboring countries** (Georgia, Iran). Armenia has large neighbors who can be the natural extensions for growth for many local IT successful companies. Inter-government agreements in this regards would eliminate any regulatory and legislative barriers and allow the Armenian IT companies to enter these markets.

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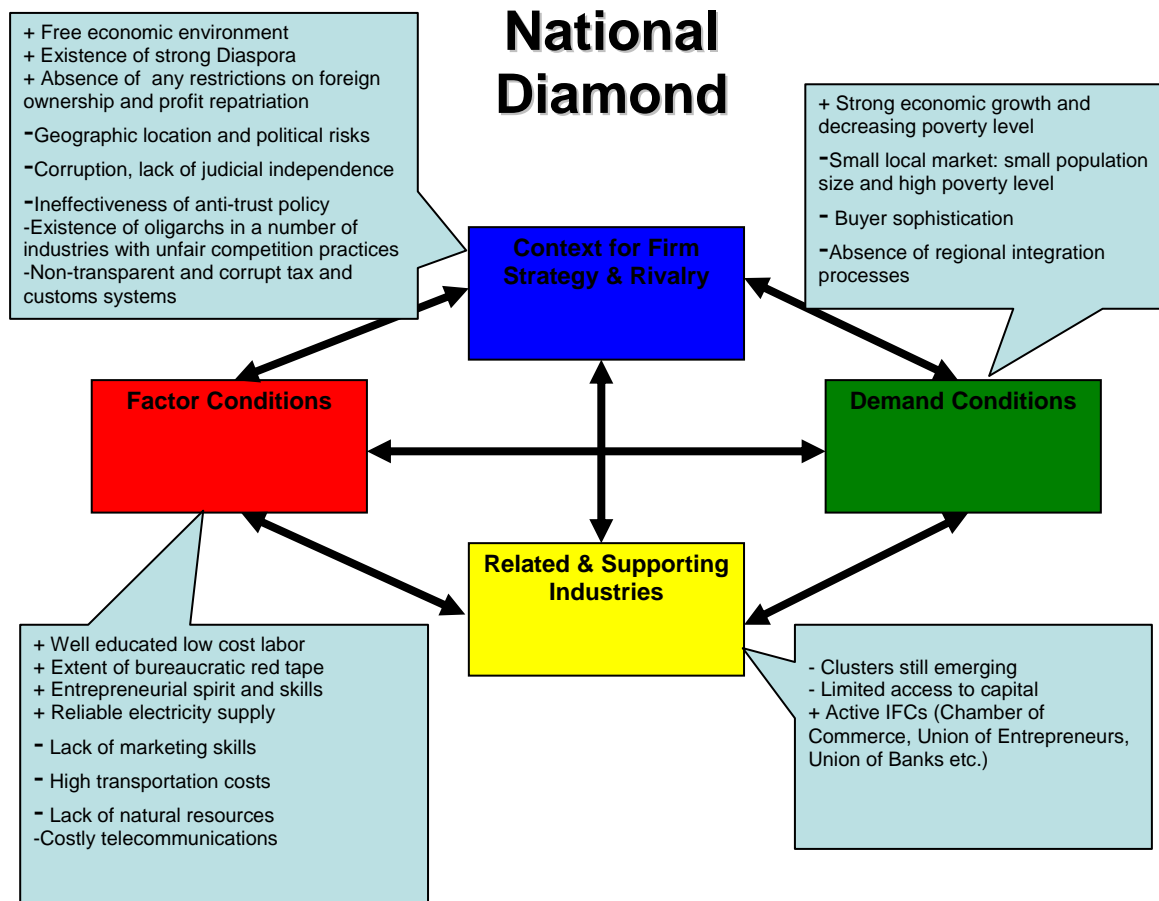
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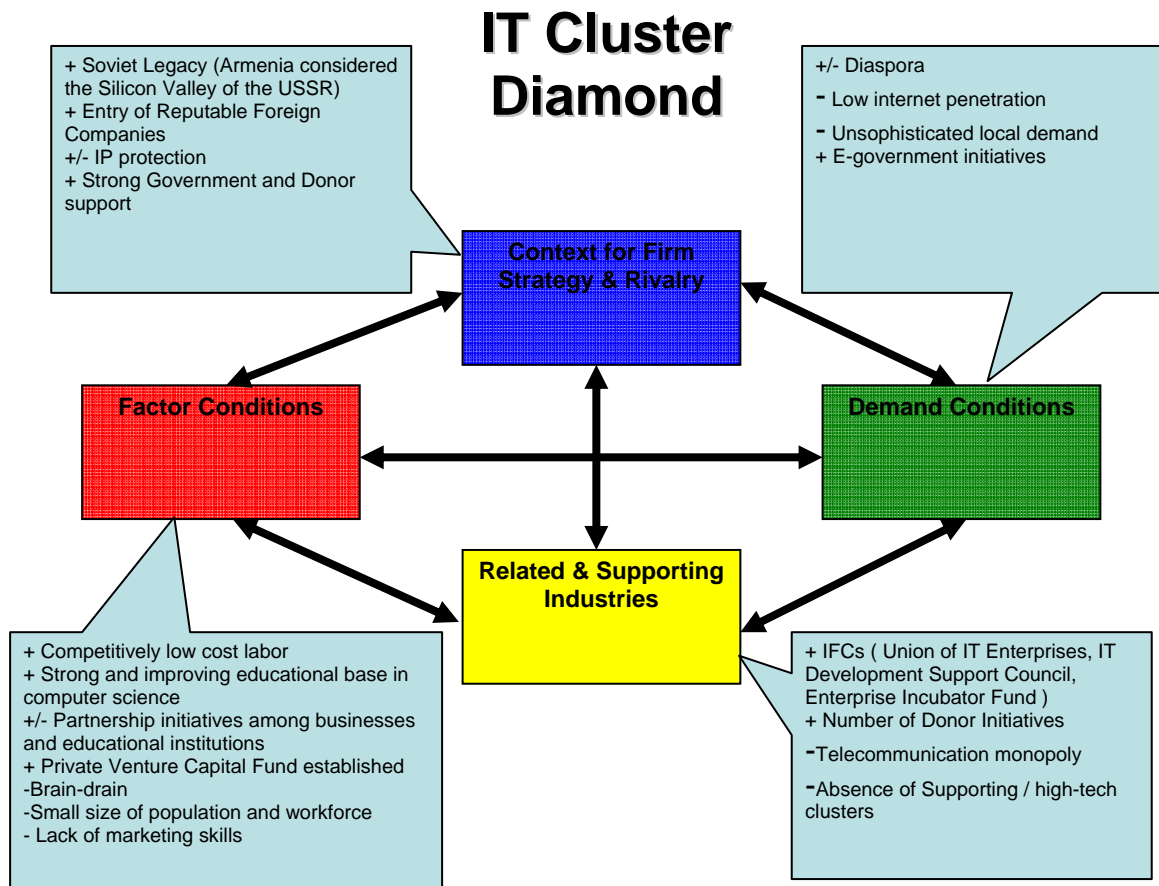
Silicon Armenia

Armenia Development Gateway

## Exhibit 1: National Diamond



## Exhibit 2. IT Cluster Diamond



**Exhibit 3-Institutional Arrangements on IT Cluster-  
Government, IFCs, Educational Institutions and the Private Sector**

