Research Center

ECONOMY AND VALUES RESEARCH CENTER

Attracting MNCs to Armenia

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Economy and Values Research Center (EV) is a think-and-action-tank striving for competitive Armenia. The Center's activities are focused on studying and promoting competitiveness agenda, educating and advising current and future leaders in public policies and strategies, as well as exploring value and cultural foundations of development.

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I. EXECUTIVE SUMMARY

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In 2005, the global FDI inflows experienced a tremendous 29% increase in both the developed and developing world over 2004, and reached $916 billion after the slow down and recovery from the sluggish economic performance of developed countries in the early 2000s. The main mode of FDI was cross-border M&A deals ($716 billion or about 78% of FDI) (UNCTAD, 2006).

Growing global competition forces MNCs to undertake steps to increase efficiencies of value chains to stay competitive in the global market (i.e. upgrade skills, functional structures, horizontal integration, etc). In these circumstances, the opportunity of a country to attract a particular type of FDI or an element/component of value chains is determined by MNCs' internationalization strategies, structure of value chain and its type of governance from one hand (Humphrey et al., 2002), and a host country's specific locational advantages on the other hand (Narula et al., 2000).

At the end of the 1990s MNCs were considering two sets of prerequisites for putting the country on the short-list: institutional background of an attractive investment climate; and doing business with a country's supply of economic and human resources (fiscal incentives, size of the market, skilled human capital, and supporting industries) (Michalet, 2000).

In the first half of the 2000s medium high tech and high-tech manufacturing MNCs were expanding globally. They were planning to enter and/or increase their global presence in places such as China, Eastern Europe, Mexico, and South America. During that period both North American and Western European companies were expanding their product engineering (R&D) operations through locating them abroad. This allocation was due to the diminishing product development life cycle and rising R&D costs in their home countries (Deloitte Touche Tohmatsu, 2003).

Over the next 3 years, the high-growth potential sectors are expected to be mostly high tech industries: Internet/IP related; wireless communication services, business software, and life sciences. One of the biggest challenges for the global expansion of high tech companies was IPR protection issues in developing countries (Deloitte Touche Tohmatsu, 2007).

The companies' overseas investment in R&D was attributable to several factors such as lower cost, availability and quality of R&D labor, IPR, and reliable educational systems. Emerging Asian and Eastern European countries would continue to attract FDI in R&D. At the end of 2005, about 1/3 of global investors was planning to make FDI in R&D in Eastern Europe over the next 3 years. According to A.T. Kearney's survey of global companies, in 2006 roughly 80% of respondents were planning to allocate corporate functions (including IT and call centers, followed by business process, such as accounting, R&D, etc) abroad, vs. 66% in 2004 (A.T. Kearney, 2006).

"First-tier" MNCs Global Value Chain Analysis

Currently, Armenia is in search of the most suitable, proactive and effective strategies for FDI attraction given its severe economic and geopolitical constraints. First of all, the strategy should address the issue of investment targets, i.e. what types of activities of which MNCs could be possible targets for attracting into Armenia. Being a small, landlocked country in conflict with 2 of its 4 neighbors, it has little chances of attracting market seeking FDI, or emerging as a regional hub for mass productions (in case of efficiency seeking FDI). Hence, the broadest hypothesis of the study has been the following:

Hypothesis: *Armenia has a potential to attract high-tech and medium high-tech companies for higher value processing and R&D activities.*

In order to test the hypothesis and develop key messages, the patterns of geographical distribution of value chain activities of top-tier high-tech and medium high-tech MNCs have been studied. For the purpose of the research, 20 technology MNCs have been selected to trace internationalization patterns of global value chains.

The following four criteria have been applied in selecting the MNCs for global value chain study:

1. *Industry focus* – high-tech and medium high-tech industries that potentially could be attracted to Armenia;
2. *R&D spending levels* - largest global R&D spenders;
3. *Global sales levels* – largest companies in terms of sales;
4. *Armenia's expertise level* - both previous and current expertise in that specific sub sector.

The developed world is the leader in attracting all elements of the global value chains of all studied MNCs. The large markets, sophisticated customers and suppliers, superior R&D capabilities, and human capital of the developed world provide still better sources for gaining competitive advantages for MNCs. However, emerging markets, cost considerations and a shortage of the highly skilled professionals in the developed world is supporting the rise of the developing world as an FDI destination.

The most internationalized element of global value chains of the selected MNCs is Sales & Marketing. On average, in 76% of their worldwide locations (countries) the selected MNCs have set up sales representations/service centers. The second most internationalized value chain element is manufacturing, with on average of 51% of countries hosting production/fabrication, assembly & testing units, followed by R&D with an average of 25% of countries hosting such element of global value chain. This percentage is consistent with the latest developments in internationalization strategies of R&D activities worldwide, which started in the mid 1990s, and reflects the potential of a limited number of countries to host R&D subsidiaries/affiliates of the top MNCs (UNCTAD, 2005).

By the R&D element of value chain activities, the largest concentration is observed in developed countries, due to the availability of highly skilled scientists/researchers. However, the share of developing countries is notable, and is expected to grow (A.T. Kearney, 2006; UNCTAD, 2005). Many of the selected MNCs have set up their R&D centers in China, which along with India has emerged as a global R&D powerhouse. Eastern Europe is gaining its place as a R&D Center.

The study of selected MNCs provided sound criteria to select benchmarking countries with possible implications for Armenia. Two countries have been selected: one from CEE region (Hungary), and the other one from the Middle East (Israel). In CEE region, Hungary is the distinct leader that has managed to attract 10 out of 20 selected MNCs; first as a low cost destination, but latter transforming itself into a higher value processing and R&D powerhouse in CEE. Israel focused mostly on R&D and higher value processing FDI and is the leader in hosting high concentration of high tech first tier MNCs.

Armenia vs. Hungary and Israel

Compared to Israel and Hungary, Armenia performs well in terms of macro-economic stability and health and primary education. However, Armenia lags behind its main comparators in higher education and training, technological readiness and innovation.

Starting from mid-60's Israel positioned itself as high-tech powerhouse in the region and concentrated its efforts on attracting R&D units of high tech MNCs. In contrast, Hungary showed evolutionary transformation from low cost, low value added to higher value processing and R&D businesses. Both Hungary and Israel relied on attraction of FDI from MNC's through implementation of targeted and consistent strategies. Key success factors in both cases were the supply of a highly skilled workforce developed through extensive educational initiatives, the establishment of a strong and efficient national innovation system and an infrastructure with significant governmental support.

Despite the liberal and supportive policy in the field of FDI, Armenia has not managed to attract significant volumes of foreign investment. The continuous high growth trend of FDI recorded during last 3 years was supported by reinvestments of currently operating companies. FDI is concentrated mostly in resource intensive industries such as mining, food processing sectors and infrastructure. Russia, Germany and the USA are the main home countries of foreign investors in Armenia. From high-tech sectors only software development and chip design attracted FDI partially due to active Diaspora connections in the US.

The research presents a comparison of the main factors for attracting high value processing and R&D elements of the value chains of global technology MNCs in Hungary, Israel and Armenia. It includes the main elements of national innovation systems, FDI and R&D incentives, educational initiatives and infrastructures.

Conclusions and Proposed Measures

Armenia still has to match the competitors in providing a comparable business environment and incentives, and strive to create differentiating elements of its holistic value proposition. Therefore, the necessary measures aimed at attracting global technology MNCs can be divided into two groups or layers of activities titled here as Matching the Best Practice and Creating Unique Proposition. Layer One measures (provision of tax incentives for innovative product design, R&D grants and subsidies, stimulating university-business collaboration, creation of science parks and state supported innovation fund, etc.) shall aim at creating comparable to other alternative destinations attractive conditions for MNCs, while Layer Two measures (develop specific competencies of labor pool and engineers and scientists, actively involving the Diaspora in accessing key decision makers of targeted MNCs, forming an alliance of current MNCs to promote Armenia, upgrading the current institutional and human capacities in the field) shall create set of factors, resources and competences that may be specific to Armenia and will differentiate it from other destinations.

II. MNC'S GLOBAL STRATEGIES AND FDI TRENDS

"Global expansion is inevitable. Vast new markets await most manufacturers in areas such as China, India, Eastern Europe, and South America. … they will face mounting pressure to boost the efficiency of their global networks not just every 5 or 10 years, but on an ongoing basis"

Deloitte Touche Tohmatsu, 2003

The competition among countries for attracting "first-tier" MNCs is getting very intense. The attraction of such global players requires a carefully crafted set of strategies and policies. The entry of major "first-tier" global players in a country spreads strong positive signals among other MNCs to consider the particular destination for investment. Government policies, economic reforms, effective positioning of the country and targeted FDI promotion have widely contributed to this success in several countries (e.g. South-Eastern Asian countries, Ireland, and new EU member countries such as Hungary and Poland).

Growing global competition forces MNCs to undertake steps to increase efficiencies of value chains to stay competitive in the global market (i.e. upgrade skills, functional structures, horizontal integration, etc). In these circumstances, the opportunity of a country to attract a particular type of FDI or a component of value chains is determined by MNC's internationalization strategies, structure of value chain, and its type of governance (Humphrey and Schmitz, 2002) from one hand and host country specific locational advantages (Narula and Dunning, 2000) on the other hand.

FDI Global Trends

In 2005, the global FDI inflows experienced a tremendous 29% increase over 2004 and reached $916 billion after a slow down and the recovery from the sluggish economic performance of the developed countries in the early 2000s. The growth reflected the number of cross-border M&A deals ($716 billion or about 78% of FDI). In cases of outward FDI originating from the developing countries, mainly green-field modes of entry were prevailing. Both developing and developed countries gained from the FDI inflows, 126 out of 200 countries received FDI. The developing countries received the 36% of FDI, experiencing a 22% growth over 2004 to $334 billion, and following a tremendous increase of 57% over 2003. The largest FDI recipient in 2005 was the United Kingdom, followed by the United States, China and France (UNCTAD, 2006). In the developed world 75% of the inward FDI flows received 5 host economies: the United Kingdom, the United States, France, the Netherlands and Canada.

All developing regions experienced a tremendous increase in FDI inward inflow: Africa – 78%, West Asia-85%, East and South-East Asia-20% increase. Only Latin America and the Caribbean Region experienced a slight increase of 3% after a remarkable 118% growth in 2004 over 2003 record high $9.7 billion inflow of inward FDI. However, Brazil, China, Hong Kong, Mexico and Singapore remained the largest FDI recipient host economies receiving 48% of all inward FDI to developing countries. In South-East Europe and the Commonwealth of Independent States (CIS), the level of inward FDI Inflows remained almost at the same level ($40 billion). Ukraine experienced a rise in FDI inflows, while other major recipient host countries such as Bulgaria, Kazakhstan, and the Russian Federation experienced decline (UNCTAD, 2006).

MNC Global Strategies

According to an FIAS survey of almost 100 MNCs from the United States, Europe and Japan from seven different industrial sectors[1] conducted in 1999, the global strategy of these corporations was described as particular region-oriented market seeking FDI "*As a result of the availability of low cost*

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[1] chemicals, electronics, electrical equipment, telecommunications, hotels, textiles and apparel, and automotive vehicles and parts

natural and human resources…, and of economies of scale…, and product differentiation…" (Michalet, 2000). However, certain preconditions need to be met in order to successfully implement the global strategies (FDI localization characteristics and the selective approach of potential host-countries). The results of the survey indicated that MNCs consider two sets of prerequisites for putting the country on the short-list: institutional background of an attractive investment climate and the supply of economic and human resources (fiscal incentives, size of the market, skilled human capital, and supporting industries).

According to the Palmade and Anayiotas (2004), "*Destination sectors of FDI are also becoming more varied. FDI has evolved from focusing primary on the natural resources, infrastructure and manufacturing to also covering banking, retail, construction, tourism and offshore services. Moreover, FDI is increasingly market seeking rather than efficiency seeking, offering opportunities to any country willing to open its markets or integrate with its neighbors.*" Among the requirements for the efficiency seeking investment in manufacturing stated were "*low factor cost, a flexible labor market, a small regulatory burden, efficient infrastructure and customs*", and among the less obvious factors "*easy access to a competitive supplier base and business service providers*".

Medium high tech and high-tech manufacturing MNCs

According to Deloitte Touche Tohmatsu (2003)[2] the pressure to allocate the elements of the value chain globally comes from 3 main areas: customer demand for lower cost, the pursuit of the markets around the world, and innovation. About 53% of the manufacturers moved production to the low-cost locations. However, low-cost was not the only reason to move value chain elements abroad. Stagnant domestic markets push MNCs to find markets globally, therefore "*To supply markets such as China and India, many manufacturers must bring their sourcing, manufacturing, and distribution operations with them...*" These manufacturers were not trying to leave their markets; instead they were becoming more aggressive in pursuing new markets. For the coming years the respondents were planning to enter and/or increase their global presence in countries such as China, Eastern Europe, Mexico, and South America. Low-cost manufacturing destinations would attract North American and Western European manufacturers, and the expansion would happen in the form of either new or expansion of current facilities. Both North American and Western European companies were planning to expand their product engineering (R&D) operations or locate abroad over the next 3 years.

In 2002, the Japanese consumer electronics giant Sony was considering the possibility of building a semiconductor assembly plant in China for the fast-growing Chinese market. According to the spokesman of the company, "Considering the growth potential of the Chinese market, China is a very attractive location to shift our production facilities. The global market is changing so fast, and cost reduction is very important." (BBC News, 2002)

Introducing new products faster and better was reported to be the most critical success factor (driver of revenue growth). The MNCs were expecting that the 35% of the revenue would come from the new products developed and introduced within the preceding 3 years. High R&D expenditures were pushing the companies to expand their global presence and supply chains, and in high and medium high-tech industries this was a way to recover R&D costs. Product development markets are becoming more "niche oriented" rather than "mass market focused."

The Deloitte Research analyzed MNCs along 2 dimensions: complexity as a measure of dispersion of value chain operations around the globe; and value chain capabilities as a measure of product innovation, time to market, product quality, and customer service levels. The roughly 7% of the MNCs referred to as "complexity masters" (high global value chain complexity and high value

[2] According to the results of the research on the global value chain complexity conducted by Deloitte Research (2003) among nearly 600 executives of manufacturing companies based in the Western Europe (51% of respondents), North America (36%) and Central and Eastern Europe (13% of respondents) from the following industries: aerospace and defense; automotive; consumer products; life science; process and chemicals; high technology and telecommunications; and general manufacturing (including metal fabrication, industrial machinery and equipment.

chain capabilities) were, on average, 46% more profitable than those with high global value chain complexity but weak value chain capabilities.

According to Deloitte Touche Tohmatsu (2005)[3] the supply chain cost structure is not of major attention, and supply chain network was optimized on a "local" basis, rather than "*redesigning the businesses from a global point of view*". The success of "complexity masters" along with low-cost sourcing and new market entry was attributable to "*early and ongoing optimization of the total network*", and if sourcing and design of the supply chain are not taken into account early in the product development, a manufacturer can lose 70-80% of its future cost reduction opportunities in the lifecycle of its product. However, the optimization process is subject to competitive drivers (demand and supply chains and product development), compliance drivers (regulatory issues, taxation, and etc) and infrastructure optimization (combination of people, organization, processes, and technology underpinnings).

GlaxoSmithKline moved from a country-based manufacturing approach to a global approach (fewer plants that are dedicated globally to specific parts of a drug's life cycle). The restructure of global network saved the company $500 million annually. Deloitte Touche Tohmatsu (2005)

Technology MNCs
The results of the 2007 Global Survey of CEOs in the Deloitte Technology Fast 500 (Deloitte Touche Tohmatsu, 2007), revealed that for those of them who were planning to expand abroad, North America was seen as the best opportunity. The highest scored factor as an engine of sustainable growth was cited "*high quality employees*". Offshore labor force was considered as "critical" or "very important" factor for the future growth of the company according to the 45% of the surveyed executives. *Off-shoring is changing its meaning from tapping into the cheapest available talent into the best talent.* Over the next 3 years, the high-growth potential sectors were expected to be Internet/IP related, wireless communication services, business software and life sciences. One of the biggest challenges for the growth of the fast technology companies was stated to be IP Protection issues.

FDI Destinations of Future
According to A.T. Kearney's year-end 2005 FDI confidence index survey (A.T. Kearney, 2006)[4] China and India were considered the most attractive FDI locations. The survey results reported that the investor's confidence level on Eastern European countries increased in comparison to the previous year's rankings. The rising cash reserves of the largest MNCs would bring into conflict the "*rationale for holding cash*" with "*overseas growth opportunities*". However, 54% of the respondents were planning to increase foreign investments. The investors preferred China, India, Brazil, Russia, Poland, and Mexico as manufacturing destinations over Western Europe.

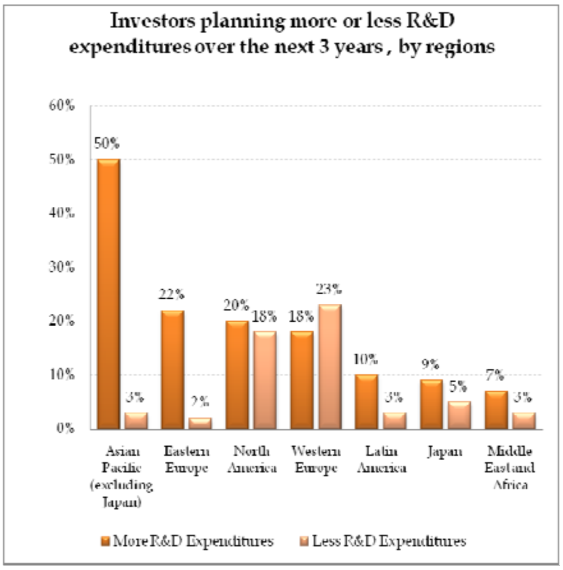
The companies' overseas investment in R&D was attributable to several factors such as lower cost, availability and quality of R&D labor, IPR, and reliable educational systems. Emerging Asian and Eastern European countries would continue to attract new FDI in R&D, while FDI in developed countries would increase at a less robust pace. About 1/3 of MNCs were planning to make FDI in R&D in Eastern Europe over the next 3 years. About 48% of MNCs were planning to expand their FDI budget over the next 3 years vs. only 3% planning to reduce spending. About 75% of the increased R&D budget would flow into Emerging Asian countries and Eastern Europe. More than

[3] According to the results of the research on efficient optimization of the global value chain, conducted by Deloitte Research (2005) and based partially on executives survey at about 800 companies (business units) executives from Asia-Pacific (10%), Central and Eastern Europe (10%), North America (34%), and Western Europe (44%) from the following industries: aerospace and defense; automotive; consumer products; life science; process and chemicals; high technology and telecommunications; and general manufacturing (including metal fabrication, industrial machinery and equipment.

[4] The survey was conducted among top executives/decision makers of the world largest 1,000 companies that generated 70% of the Global FDI The investors were asked to express their opinion on 68 destinations (more than 90% FDI recipient countries), and their future investment prospects.

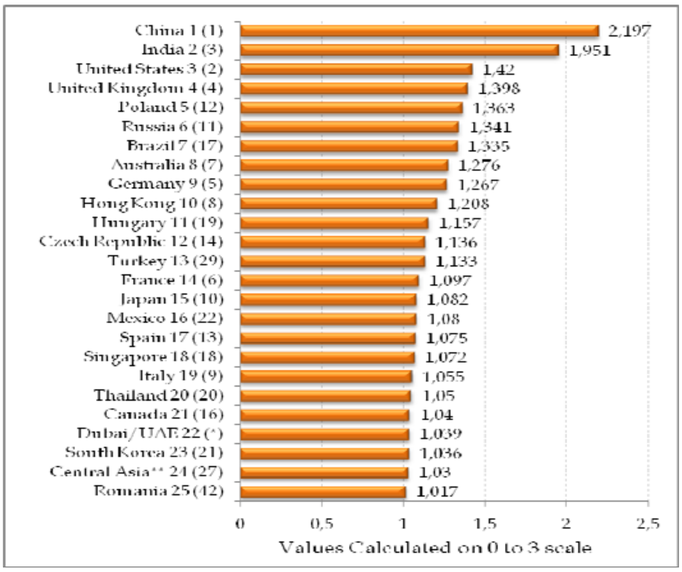
40% of investors were planning to make R&D FDI in China and India over the next 3 years. Eastern Europe and Russia were reported to be leading R&D FDI destinations. The US, UK, Japan and Germany would consider China and India as future R&D FDI locations. Roughly 80% of respondents were planning to allocate corporate functions (including IT and call centers, followed by business process, such as accounting, R&D, etc) abroad over the next 3 years, vs. 66% in 2004.

Figure 1. Investors plans for R&D spending



Source: A.T. Kearney 2006.

Figure 2. Investment Confidence Index: Top 25 destinations (December 2005)



Source: A.T. Kearney 2006.
Note: * UAE appeared for the first time, ** Azerbaijan, Belarus, Kazakhstan, and Turkmenistan; the rank in parenthesis are for the 2004

The survey of the MNCs (2005) conducted by the UNCTAD (Global Investment Prospects Assessment)[5] revealed a future rise of market-seeking FDI. From the perspective of the relocation of the elements of the value chain, 80% of all surveyed stated that production was the most likely component to be relocated, followed by logistics and support services. R&D was the least likely component to be relocated abroad. According to the survey, only 20% of MNCs considered this element as the most likely component of the value chain to be relocated overseas. However, in case of the developed countries, the 84% of the investment promotion agencies (IPAs) from developed countries consider the R&D as the most likely element of the value chain to be relocated to other developed countries. The separate survey results of top R&D spenders (UNCTAD, 2005) clearly stated the rise in foreign FDI in R&D by 2009 with major host destinations such as China, the US, and India.

The list of the most favored locations of the top 100 MNCs from developed and developing countries in 2005 (See Appendix 1, Table A.1.) identifies the same trend observed in the beginning of the 2000s (market oriented FDI coupled with the efficiency seeking strategies within the regional context), and that would likely continue at least in the short term. The rise of R&D FDI will continue over the short-run, and the high tech and medium high tech MNCs will move their higher value processing activities from the developed countries, and expand their presence in countries with a highly skilled technical/scientific workforce.

[5] The survey was conducted in the first half 2005 among 325 largest MNCs of the world generating 92% of the global FDI flow, 76 international experts and 152 IPAs with 71% of response rate (75% from developing countries and 70% from developed countries) and was aimed at figuring out the short term (2005-2006) and medium-term (2007-2008) prospects of MNCs regarding the pattern of investment, mode of entry, favorite locations, element of value chain to relocate abroad, etc.

III. MNC'S GLOBAL VALUE CHAIN ANALYSIS

Objective

The competition for attracting global MNCs is becoming fierce. Increasingly, countries hoping to attract MNC's are imitating successful countries. On one hand, Asian countries are considered the leading destinations for cost saving operations; on the other hand, there is a visible trend of MNCs allocating higher value processing units based on mostly "high-end" elements of business environment, sometimes regardless of the size of the economy and the rising wages, such as in the CEE countries. In this context, Armenia is currently in search of the most suitable, proactive and effective strategies with consideration of its severe economic constraints. That strategy should address the issue of investment targets, for example, what types of activities of which MNCs could be possible targets for attracting into Armenia. As a small, landlocked country, in conflict with two of its bordering neighbors, Armenia has few chances to attract market seeking FDI or to emerge as a regional hub for mass productions, in the case of efficiency seeking FDI. Thus, the broadest hypothesis of the study has been the following:

Hypothesis: *Armenia has a potential to attract significant investments of high-tech and medium high-tech companies for higher value processing and R&D activities*.

Methodology

The value chain activities of top-tier, high-tech, and medium high tech MNCs have been studied in order to test the hypothesis and to develop the key messages of the patterns of geographical distribution of value chain activities. For the purpose of the research, twenty global technology MNCs have been selected to trace the internationalization patterns of their global value chains.

The following four criteria have been used for the selection process of the MNCs for global value chain study:

1. *Industry focus* - high tech and medium high tech industries with potential interest in Armenia;
2. *R&D spending levels* – the largest global R&D spenders;
3. *Global sales levels* – the largest companies in terms of sales
4. *Armenia's expertise level* - both previous and current expertise in that specific sub sector;

The classification of industries into high, medium, and low tech has been assumed using an adapted methodology of the UNCTAD. This classification is based on the R&D intensity indicator presented in the Table 1.

Table 1. Classification of manufacturing industries by R&D intensity

Industry category	R&D intensity	Industries
High technology	>5%	Aircraft and spacecraft; pharmaceuticals; office, accounting and computing equipment; radio, television and communications equipment; medical, precision and optical instruments
Medium-high technology	1.5-5%	Electrical machinery and apparatus not elsewhere classified; motor vehicles, trailers and semi-trailers; chemicals excluding pharmaceuticals; railroad equipment and transport equipment not elsewhere classified; machinery and equipment not elsewhere classified
Medium-low technology	0.7-1.5%	Coke; refined petroleum products and nuclear fuel; rubber and plastic products; other non-metallic mineral products; building and repair of ships and boats; basic metals; fabricated metal products, except machinery and equipment
Low technology	<0.7%	Manufacturing, not elsewhere classified, and recycling; wood, pulp, paper, paper products, printing and publishing; food products, beverages and tobacco; textiles, textile products, leather and footwear

Source: United States, NSB 2004, Table 6-1.

Note: R&D intensity is direct R&D expenditures as a percentage of production (gross output).

The 2003 database of the top 500 European R&D spenders and the top 500 non-European R&D spenders of the Institute for Prospective Technological Studies (IPTS) have been used for the purpose of this study (IPTS, 2004). From that list, the companies involved in Electronic & Electrical, IT hardware, Pharma & Biotech, and Software & Computer Services sectors have been identified and ranked according to the R&D spending. Subsequently, a weight of 0.6 was assigned to the MNCs' respective rank. The same companies were separately ranked according to the net sales, and a weight of 0.4 was assigned to the MNCs' particular rank. These two scores were summed, and the MNCs with the highest total score have been selected for use. Table 2 provides the list of the 20 companies selected for the purpose of the research.

Table 2. List of selected global high-tech companies

Company	Country of origin	R&D investments, 2003 (m€)	Net Sales, 2003 (m€)	FTSE Sector
Siemens	Germany	5,511	74,233	Electronic & electrical
IBM	USA	4,011	70,663	Software & computer services
Matsushita Electric	Japan	4,285	55,331	Electronic & electrical
Pfizer	USA	5,653	35,825	Pharma & biotech
Sanofi-Aventis*	France	4,240	25,863	Pharma & biotech
Sony	Japan	3,278	55,286	Electronic & electrical
Johnson & Johnson	USA	3,714	33,188	Pharma & biotech
Nokia	Finland	3,978	29,455	IT hardware
GlaxoSmithKline	UK	3,961	30,429	Pharma & biotech
Hewlett-Packard	USA	2,895	57,923	IT hardware
Hitachi	Japan	2,751	63,858	IT hardware
Microsoft	USA	3,694	25,518	Software & computer services
Intel	USA	3,457	23,896	IT hardware
Toshiba	Japan	2,491	41,274	IT hardware
Samsung Electronics	South Korea	2,382	43,127	Electronic & electrical
Motorola	USA	2,990	21,452	IT hardware
Roche	Switzerland	3,055	20,012	Pharma & biotech
Philips Electronics	Netherlands	2,617	29,037	Electronic & electrical
Fujitsu	Japan	2,114	34,158	IT hardware
Novartis	Switzerland	2,978	19,712	Pharma & biotech

Source: EU Industrial R&D Investment Scoreboard, Institute for Prospective Technological Studies, European Commission's Joint Research Centre (JRC), 2004; http://iri.jrc.es/research/scoreboard_2004_vol2.htm (May 2007)

Note: In the original database, Sanofi and Aventis were presented as separate companies, since the databases contained data prior to merger of these 2 companies, the team summed up the R&D spending and net sales of the companies and presented the figures as the data of a single company of Sanofi-Aventis; GE wasn't included in the list because of the lack of data as well as extensive involvement in both low and high tech industries due to extremely high level of industry diversification.

Upon selecting the companies, the global value chain elements of the targeted MNCs have been thoroughly screened and analyzed. The main information sources were corporate web sites, news reports; annual corporate reports, the Thomson Gale Goliath Database, publicly available filings etc[6].

Grouping of value chain activities

Different operations/value chain elements of the selected companies were grouped into 8 broad categories presented in the Table 3. This grouping was done to combine similar functions/elements into one broad category for the purpose of the analysis, due to the fact that the

[6] The authors acknowledge that due to the scope of the research and unavailability of data, the number of the locations is incomplete, however the available information enables the team to trace the pattern of the internationalization strategy of the selected MNCs

selected MNCs specify or define differently the same value chain element/function (for instance, some MNCs present Assembly and Testing as a joint operation, while others separate them).

Table 3. Grouping of value chain elements/activities

No	Grouped value chain	Value chain components' definition
1	Operations	Global Headquarter; Regional Headquarter; Consumer products Headquarter; Holding company; Administration
2	Manufacturing	Assembly service; Assembly & Test; Communications (equipment); Manufacturing/Production/Fabrication; Toll manufacturing by third parties; Joint-venture (particularly in the area of manufacturing); Network Technology; Mobile devices and enhancement;
3	Sales & Marketing	Logistics; Sales & Marketing; Sales Support; After Sales Service; Distribution; Service; Other Support; Liaison Offices; Supply of telecommunications; Installation and maintenance; Transportation Service;
4	R&D	R&D; Clinical laboratories; Clinical Research Units; New Projected clinical research units; Network Research Lab; Technical Support; Technology Center; Design Center; Chip Design and Development; Engineering/ Service/Installation (adaptive R&D)
5	Financial services and business consulting (FSBC)	Finance; Insurance; Consulting; Business Services; Real Estate
6	Software development (SW)	Software Design; Computer Programming Service; A Division of Software; Software Development; ICT Services; Chip Design and Development; Software Development and ICT Services; Customer solution laboratories; ICT Services and IT solutions
7	Infrastructure	Outsourced BPO services (accounting, HR)
8	Other	Interactive Media Solutions Division; Media advertising; Publishing; Construction; Training centers; Financial Intermediation; etc

Internationalization of top 20 technology MNCs

The number of global value chain elements of 20 MNCs was considered as a proxy of internationalization. The geographical distribution of value chain elements of the MNCs of interest showed that these companies are following the global trend to reach new potential consumers by taping into the available talent worldwide to design new products and services, while trying to minimize production costs. Therefore, the MNCs expand globally by internationalizing global value chain elements worldwide to maximize profits. The most internationalized element of global value chain of the selected MNCs is Sales & Marketing. On average, in 76% of their worldwide locations (countries) the selected MNCs have set up sales representations/service centers. The second most internationalized value chain element is manufacturing, with on average of 51% of countries hosting production/fabrication, assembly & testing units, followed by R&D with an average of 25% of countries hosting such element of global value chain. This percentage is consistent with the latest developments in internationalization strategies of R&D activities worldwide, which started in the mid 1990s, and reflects the potential of a limited number of countries to host R&D subsidiaries/affiliates of the top MNCs.

Figure 3. Distribution of value chain elements by host countries for all selected MNC

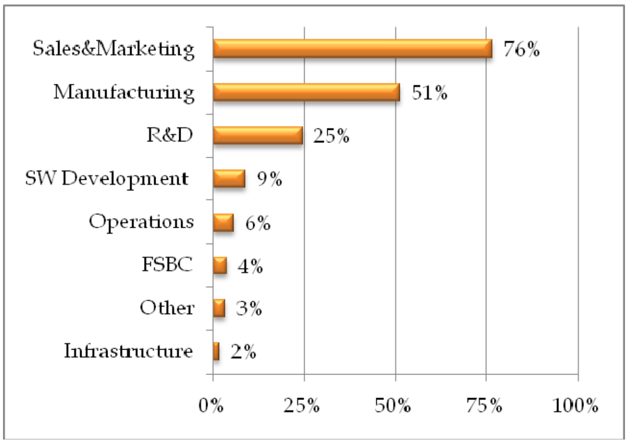


Figure 4. Worldwide presence of selected companies (number of countries)

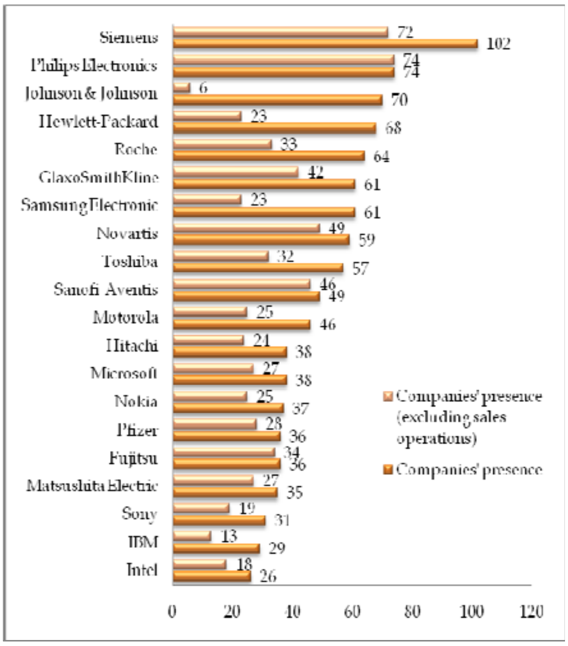
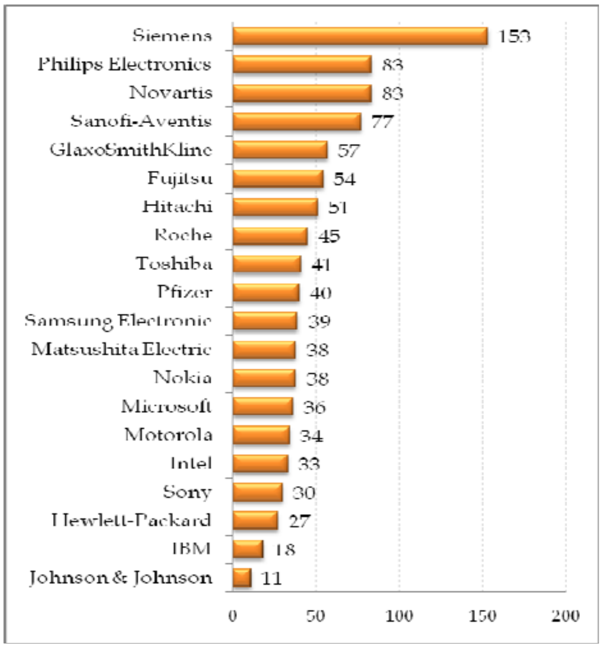


Figure 5. Number of value chain elements/ activities of MNCs distributed worldwide (excluding Sales & Marketing)



Siemens is the distinct leader in internationalizing its value chain (geographic distribution of value chain activities). The company's affiliates/subsidiaries are located in 102 host countries; however, excluding sales & marketing affiliates, the number of countries hosting non-sales subsidiaries/affiliates is 72, lagging behind Philips Electronics (74 affiliates). Although Siemens is the leader in R&D internationalization, it also incorporates adaptive R&D activities in countries that are not considered as traditional destinations for such type of investments (i.e. natural resource rich countries where large investments are undertaken to upgrade exploitation capacities e.g. for gas and oil).

The most internationalized sector from our sample of 20 companies is Electronic & Electrical. This phenomenon could be explained by the fact that these MNCs are diversified in terms of offering wide range of products that require different skills for each type of product. In case of low skill requiring assembly/manufacturing, MNCs can chose the particular destination based on low cost of the workforce, market size, regional perspective, etc. However, in cases of higher value processing activities and R&D activities, the availability and the quality of scientists/engineers becomes a critical factor. The second most internationalized sector was Pharma & Biotech, followed by IT hardware and Software & Computer Services. The least internationalized sector from our 20 company sample is Software & Computer, which could be explained by the fact that MNCs could conduct R&D activities through solution partners (e.g. Microsoft); and the global outsourcing (both near-shore and offshore) is growing worldwide (CBI, 2006; Gartner, 2006; Forrester, 2006).

Geographical distribution of the value chain elements

The developed world is the leader in attracting all elements of the global value chains of all studied MNCs. The large markets, sophisticated customers and suppliers, superior R&D capabilities, and human capital of the developed world provide still better sources for gaining competitive advantages for MNCs. However, emerging markets, cost considerations and a shortage of the highly skilled professionals in the developed world is supporting the rise of the developing world as an FDI destination.

Only 14% of value chain activities of selected MNCs were hosted by CIS, Middle East and CEE countries, while the remainer was hosted by developed and other developing countries. The CIS is considered the least internationalized in terms of hosting value chain elements of the MNCs of interest (2%). Central and Eastern Europe and Middle Eastern countries host 8% and 4% of global value chain elements/activities.

The United States and the United Kingdom are the leaders of hosting the most value chain elements/activities of the MNCs of interest. The leaders in the CIS are Russia, Ukraine and Kazakhstan, in the CEE, Hungary and Poland, and in the Middle East, Turkey and Israel.

Table 4. Top 10 leader host-countries in each group of countries

Developed countries		CIS		Central and Eastern Europe		Middle East		Other Developing	
USA	88	Russia	22	Hungary	41	Turkey	22	China	53
UK	60	Kazakhstan	6	Poland	30	Israel	20	Singapore	43
Japan	54	Ukraine	6	Czech Republic	18	Egypt	13	India	41
Germany	52	Azerbaijan	4	Romania	17	UAE	13	Brazil	39
France	45	Armenia	4	Croatia	11	Iran	6	Malaysia	32
Italy	40	Uzbekistan	3	Slovak Republic	10	Saudi Arabia	6	Mexico	31
Netherlands	37	Belarus	3	Slovenia	10	Lebanon	2	South Korea	30
Switzerland	34	Moldova	2	Bulgaria	8	Oman	2	Philippines	30
Spain	34	Kyrgyz Republic	2	Estonia	7	Bahrain	1	Argentina	29
Australia	33	Georgia	1	Lithuania	7	Jordan	1	South Africa	25

The operations which represent the core of the business activity are generally less geographically diversified, and are often carried out by the corporate headquarters located in the home countries of MNCs. The distribution of regional headquarters shows close relation to the large regional markets: Brazil (MERCOSUR), China, India, Korea and Singapore (South Eastern Asian region).

For the Manufacturing element of global value chain activities, the United States was the leader in attracting the largest number of MNCs (19), followed by France (15), Germany (16), Spain and Japan (12), and Canada and Italy (10) among the developed countries. Mexico (18) was the leader among other developing countries followed by Brazil and China (17), Singapore (14), and Malaysia and the Philippines (13) (See Appendix 2).

By the R&D element of value chain activities, the largest concentration is again observed in the developed countries. This is due to the availability of highly skilled scientists and researchers; however, the share of developing countries is notable, and is expected to grow (A.T. Kearney, 2006; UNCTAD, 2005). Many of the selected MNCs have set up their R&D centers in China, which along with India has emerged as a global R&D powerhouse. At the same time, Eastern Europe is gaining its place as an R&D Center. Hungary is the leader in this region, managing to attract the largest number of the selected MNCs (10), followed by Poland. These countries have also successfully positioned themselves as near-shore destinations for software outsourcing from Western Europe. Companies have demonstrated less interest in investing in R&D in the CIS (Russia is the leader with 4 companies that have set up R&D centers in the country. In Azerbaijan and in Kazakhstan, one MNC is conducting adaptive R&D activities).

VI. COUNTRY SUCCESS STORIES

The study of selected MNCs provided sound criteria to select benchmarking countries with possible implications for Armenia. Two countries have been selected: one from the CEE region (Hungary), and the other one from the Middle East (Israel). In the CEE region, Hungary is the distinct leader that has managed to attract 10 out of 20 selected MNCs first as a low cost destination but latter transforming itself as a higher value processing and R&D powerhouse in the CEE. Hungary was the leader in the region who has been the first to conform to western legislative standards in order to become a favorable destination for western MNCs. While Turkey is the leader in the Middle East in terms of the attracted number of selected MNCs and value chain activities, it is mostly attributable to its large domestic market. In contrast, Israel focused mostly on R&D and higher value processing FDI (the leader in hosting high concentrations of high tech first tier MNCs). Given the parallels with Armenia, Israel has been chosen as a benchmarking country.

Israel: R&D Powerhouse of MNCs

Population, 2007	*7,150,000 (CIA, 2007)*
Area, total, 2007	*21,920 sq km (CIA, 2007)*
Income category (WB)	*High Income*
Exports, 2006	*$42.86 billion f.o.b. (CIA, 2007)*
Main exports, 2006	*Machinery and equipment, software, cut diamonds, agricultural products, chemical, textile and apparel (CIA, 2007)*
Exports partners, 2006	*US 38.4%, Belgium 6.5%, Hong Kong 5.9% (CIA, 2007)*
GDP per capita, PPP, 2006	*$26.800 (CIA, 2007)*
GDP real growth rate	*4.8% (CIA, 2007)*
Inward FDI flows, 2005	*$5 587million (UNCTAD, 2006)*
Inward FDI as a percentage of gross fixed capital formation, 2005	*25.9 (UNCTAD, 2006)*
Inward FDI stocks, 2005	*$36 343 (UNCTAD, 2006)*
Inward FDI stocks as a percentage of GDP, 2005	*29.4 (UNCTAD, 2006)*
Major MNCs operating in Israel	*Intel, IBM, Microsoft, HP, Pfizer, Phillips, Siemens, Motorola, Oracle, ISAP, National Semiconductor, Boston Scientific, GE Medical Systems, Cisco, Sun Microsystems, VERITAS Software*
Ease of Doing Business (WB)	*26 (Rank, 2006)*
Index of Economic Freedom (Heritage Foundation)	*37 (Rank, 2007)*
Human Development Index (UNDP)	*23 (Rank, 2004)*
Global Competitiveness Index (WEF)	*15 (Rank, 2006)*
Innovation Capability Index (WEF)	*7 (Rank, 2006)*
Gross Tertiary Enrollment, 2005	*57.9% (WB, 2007)*
Education Index, 2004	*0.95 (UNDP, 2006)*

With the primary focus of building an innovative private sector that is internationally competitive in terms of scarce natural resources and hostile neighbors, the government policies towards building an innovation system, investments in R&D, and capital market reforms enabled Israel to emerge as an R&D power house of the top-tier technology MNCs in the second half of 1999. The government's heavy investments in education and vocational training, high civilian R&D spending (4.7% of the GDP or $6.3 billion in 2005[7]) and the building of necessary infrastructures (the technology incubators program and the venture capital business, coupled with an influx of engineers and scientists from the former Soviet Block in the late 1980s and early 1990s) positioned Israel as a higher value processing and R&D destination. In 2006, the employment of at least 110 foreign R&D centers reached 35,000 employees, with a rate of 140 scientists and engineers per 10,000 population vs. 80 in the US and Japan. The electronics and software output reached $18.7 billion, with 13% rise over 2005, while the industry export comprised about 86% of the output[8].

[7]http:// www.planetanalog.com/news/showArticle.jhtml?articleID=199601871
[8]http:// www.planetanalog.com/news/showArticle.jhtml?articleID=199601871

Investment Incentives and Capital Market Reforms
The Law for the Encouragement of Capital Investment (LECI) was adopted in 1959 with the purpose of boosting exports and increasing employment in least developed areas by providing government grants (up to 24% of tangible assets)[9] and tax benefits depending on the location and the size of the foreign ownership. The law was deliberately favoring foreign investors to attract high-tech multinationals. Capital market reforms increased the efficiency of the stock market, making it one of the most technologically-advanced stock markets in the world (Lopez-Claros et al., 2006).

The inflow of foreign investors intensified in Israel during the 1960s and 1970s, including high-tech global players, such as Motorola (higher value processing production), Intel (R&D), and IBM (R&D). Intel Israel was the leading exporter in Israel in 2005 (about 14% of the total Israeli electronics and information export)[10], and provided employment to more than 10,000 families directly and indirectly. In 2006, the second leading company in terms of R&D personnel was Motorola, followed by HP, Marvell, Cisco and SAP (LightSpeedAnalyst Insight, 2006).

Government Support for R&D
In the late 1960s the Office of Chief Scientist (OCS) was established. The Law for the Encouragement of Industrial R&D (LEIRD) was adopted in 1984. The purpose of the law was to trigger R&D intensive, export-oriented private initiatives by providing employment opportunities to a growing labor force through grants, loans and other incentives. The OCS implemented both national and international projects (pre-seed, generic and competitive R&D).

The Magnet Programme was initiated in 1993 to strengthen collaboration between academia and private industrial firms. A consortium of industrial companies and at least one academic institution were eligible for funding. Up to 66% of the proposed project budget was funded in case of private company/companies and 80% in case of academic institution[11]. In 2005, 31 consortia were operating in the Israeli market. (Other R&D initiatives and programs are presented in table 12)

R&D business expenditures by the US-based MNCs reached $889 million in 2002 (UNCTAD, 2005). In 2006, 592 projects of 371 companies were approved by the government covering 42 of the total approved budget of $517 million[12].

Education
Since the establishment of the state of Israel, a government priority was to establish world class universities and scientific research centers. In the early 1970s the leading Israeli scientific and education centers were the Technion-Israel Institute of Technology in Haifa, the Weizmann Institute of Science in Rehovot, The Hebrew University in Jerusalem, and Ben Gurion University in Beer Sheba. In the early fifties the Weizmann University developed and assembled the first Israeli computer, similar to the first computers developed in the US in the forties. In the early 1990s industry leaders initiated workforce development training at the universities for electronics and computer science graduates from the top universities. In 2004, the science and engineering enrolment ratio was 30% (WB, 2006).

Technology Incubators
In 1991, the Government initiated the Technology Incubator Programme to assist start-ups and immigrants from the former Soviet Union who were lacking business skills, knowledge of English and Hebrew, and needed funding to commercialize innovative ideas. In 2004, there were 24

[9] http://www.moital.gov.il/NR/exeres/9DF4F491-E41C-406F-8903-894F11A502E0.htm
[10] http://www.intel.com/cd/corporate/europe/emea/heb/290083.htm
[11] http:// www.moital.gov.il/NR/exeres/111E3D4556E4-4752-BD27-F544B171B19A.htm
[12] http:// www.planetanalog.com/news/showArticle.jhtml?articleID=199601871

technology incubators. Up to 85% of funding was provided by the government in the form of grants and soft loans, with the remaining funding provided by venture firms, the incubators, or the entrepreneur. The total Incubator Programme budget was $30 million in 2006. Each incubator is implementing 10 projects on average (Lopez-Claros et al., 2006).

Venture Capital Funds

The government played a significant role in establishing the venture capital industry. In 1990, two venture capital funds were operating in the industry ($59 million of available funding). In 1992, the OSC initiated the Yozma Programme to accelerate the venture capital market by providing $100 million to attract international venture capital funds to invest in high-tech firms. Ten new international venture capital funds were soon established. In 1995-2004, venture capital investments comprised 50% of exports and 65% of foreign investments (Lopez-Claros et al., 2006). Many leading international venture capital funds established branches in Israel. The Israel Venture Association was actively raising venture capital for Israeli start-ups worldwide.

In 2006, 76 M&A deals amounted to $10.58 billion in Israel[13]. Israel attracted the first tier MNCs such as IBM, Pfizer, Phillips, Siemens, and Sony, also set up corporate R&D centers.

[13] http:// www.planetanalog.com/news/showArticle.jhtml?articleID=199601871

Hungary: FDI-led economic transformation

Population, 2007	*9,956,108 (CIA, 2007)*
Area, total, 2007:	*93,030 sq km (CIA, 2007)*
Income category (WB)	*High Income*
Exports, 2006	*$67.99 billion f.o.b. (CIA, 2007)*
Main exports, 2006	*Machinery & equipment, other manufacturing, food, beverages & tobacco, fuels & electricity, raw materials (CIA, 2007).*
Exports partners, 2006	*Germany 29.5%, Italy 5.5%, Austria 4.8%, France 4.6%, (EIU, 2007)*
GDP per capita, PPP, 2006	*$17,600 (CIA, 2007)*
GDP real growt rate, 2006	*3.9% (CIA, 2007)*
Inward FDI flows, 2005	*$6,699 billion (UNCTAD, 2006)*
Inward FDI as a percentage of gross fixed capital formation, 2005	*26.5% (UNCATD, 2006)*
Inward FDI stocks, 2005	*61,221 (UNCTAD, 2006)*
Inward FDI stocks as a percentage of GDP, 2006	*55.9% (UNCTAD, 2006)*
Major MNCs operating in Hungary	*GE, GM, IBM, HP, Phillips, Siemens, Motorola, Bosch, Sanofi-Aventis, Ericsson, Nokia, Sony, Audi, Suzuki, Ford, Opel, Astra-Zeneca, Compaq, Panasonic*
Ease of Doing Business (WB)	*66 (Rank, 2006)*
Index of Economic Freedom (Heritage Foundation)	*44 (Rank, 2007)*
Human Development Index (UNDP)	*35 (Rank, 2006)*
Global Competitiveness Index(WEF)	*41 (Rank, 2006)*
Innovation Sub-Index (WEF)	*31 (Rank, 2006)*
Gross Tertiary Enrollment, 2005	*65.2%(WB, 2007)*
Education Index, 2004	*0.95 (UNDP, 2006)*

"Only Hungary can enter a revolving door behind you and come out in front… The Hungarians are indeed stealing a march on their rivals, leaving behind an economy based on low cost manufacturing. And in doing so, the country is busy turning itself into a centre for research and development (R&D) and for high tech industry" (BBC News, 2004).

Hungary managed to attract efficiency seeking first-tier MNCs in the first half of the 1990s due to lower cost (wages and salaries), geographical location/proximity to EU market, cultural and historical ties with 2 main neighbor investor countries (Austria and Germany), market opportunity, fiscal incentives, quality of physical infrastructure, and favorable initial conditions. In the mid-2000s, Hungary emerged as a higher value processing and R&D center, losing low skills requiring manufacturing/assembly business to lower cost destinations such as China in the early 2000s.

Economic Transformation into market-oriented economy

Hungary, ahead of its CEE counterparts, started economic reforms in 1963 to liberalize the national economy. Upon the fall of the COMECON block in 1989, Hungary introduced a privatization policy favoring foreign investors. Before 1989, Hungary managed to undertake legislative changes making the country a favored destination for FDI in the first half of the 1990s (See table 9).

Primarily foreign investors became the owners of the majority of privatized banks and companies rather than voucher type of "artificial" privatization efforts in other transition economies (Havas, 2002). Many state-owned companies were privatized by the foreign companies that had developed cooperation/partnership linkages with Hungarian counterparts. The privatization policy was favoring the sale of local companies to strategic foreign investors.

Regarding to the privatization of large state owned companies by foreign companies, the following three scenarios were observed:

- closure or reduction of production capacity (even in the case of greenfield FDI);
- development into an independent Hungarian subsidiary (e.g. in food industry);
- integration of the privatized/newly established companies into global value chains of the headquarters.

Table 5. Economic transformation, Policy Initiatives and FDI pattern

Stage 1	Policy Initiatives	MNC Involvement and FDI Developments
Road to Economic Transformation into market-oriented economy: 1968-1989	1963: Preparation for economic reforms; 1968: New Economic Mechanism to give more autonomy; 1972: Legislation allowing foreign ownership subject to approval of respective authorities was passed 1982: Industrial free-trade zones regime was introduced to attract export-oriented, high-tech FDI. 1987: Value-added and personal income taxes, as well as "two-tier" banking system were introduced 1988: 50% of foreign ownership was allowed without prior permission; full repatriation of earned profit as well. The law granted duty exempts in case of in kind contributions. Foreign owned companies were allowed to establish their own "custom-free zones" for imported machinery/inputs	1985: Hungary was the leading country in the CEE region in terms of attracting FDI, with $49 million. 1989: 1,350 Hungarian companies with foreign ownership
Market-economy transformation: 1990-1995	1990: Privatization of state-owned companies favoring sales to foreign investors. 1991: Specific tax incentives were introduced to encourage R&D FDI investments in selected regions and infrastructure. 1992: No prior permission was required for setting up a 100% foreign company	1995: the leading destination in the CEE region with $5.1 billion FDI inflow. (Source: UNCTAD) 1990s: Automotive and electronics MNCs established their subsidiaries (mostly greenfield investments) in industrial free-trade zones (GM, Suzuki, Philips, Ford, Audi, IBM, Nokia, United Technologies, Sony and others)
1996-2003	1997: granting of 20% of tax allowances for R&D activities 2000: granting of 100% of tax allowances for R&D activities	Mid-1990s-2000: Audi, Nokia, Philips, Siemens, GE, Knorr Bremse, ABB, and Ericsson established R&D facilities 1999: Co-operative Research Centre (CRC) program to strengthen cooperation/collaboration between university, other non-profit R&D units and business by setting up; Early 2000s: MNCs shift or close production units (IBM, Nokia, Philips, Kenwood)
2004-2007	2004: a special 300% tax allowance for R&D activities was introduced; corporate tax rates were reduced from 18% to 16%.	2006-2007: Philips, Samsung, Bosh, GE, IBM, Sanofi-Aventis, who moved their units from Western Europe to Hungary, increased production capacity, or established new facilities and R&D centers

Sources: OECD, 2000; Havas 2002; EIU 1997; Szanyi, 2002; NKTH; BBC News, 2004, ITD; Kiss, 2007

In the latter case, companies became specialized in certain types of production, and some business functions were cut back, and in some instances, R&D, own logistics, and training were terminated (Szanyi, 2002).

The liberalization of the economy and trade policies opened new opportunities for Hungarian companies to export to Western countries. Many Hungarian manufacturers became the subcontractors of MNCs in the early 1990s, and their share in the export reached 30%. However, this figure was reduced to 20% in the late 1990s due to an increasing share of greenfield investments with the subcontracting volumes remaining at the same level (Szanyi, 2002). Due to low quality of domestic supplies, MNC's started importing from high quality western suppliers rather than Hungary. In case of MNCs, a limited number of domestic suppliers could meet the requirements of the new investors, and they used established networks of suppliers to import industrial inputs/supplies. Due to precautions of the investors regarding economic transition and the political stability of the country, the typical entry mode was M&A. Once investors gained confidence, they increased their share in existing enterprises, and greenfield investments followed.

The Hungarian economy went through structural transformation with the rise of services sector share in GDP, and with the serious decline of agriculture from 1985-1996. The same pattern was observed in the employment structure. In 1996, the industrial production accounted for 34% of GDP opposed to 35% in 1985 and 28% in 1993 (EIU, 1997). In the late 1990s, Hungary experienced strong economic growth driven by the greenfield investments of MNCs. In 1996, the private sector contributed to 70-75% of Hungarian GDP vs. 29% in 1989, a figure that reached 90% by 2000 (EIU, 1997; Havas 2002). The total stock of inward FDI reached $94 billion (about 85% of GDP) in the first quarter of 2006. Since the mid 1990s, Hungarian economic growth was attributed to the rise of the manufacturing. By 2006, manufacturing accounted for 26% of GDP, while services accounted for 53% of GDP. The export of goods accounted for 78% of GDP, vs. less than 30% in 1990 (EIU, 2007).

Higher Education

In 1999, carmaker Opel reported that "the workforce at its component plant was significantly better educated than its counterpart in Germany, with more than half holding a degree or equivalent qualification" (EIU, 2000).

In the academic year of 1990-1991 only 8.5% of the population aged 18-22 was enrolled in degree programs, and only 36% of college applicants became enrolled in different universities. Government spending as percent of GDP decreased to 5.8% in 1998 vs. 7% of GDP in early 1990s (EIU, 2002, 2005,). The primary target of the government was higher education; a lot of resources were funneled to higher education at the expense of secondary and primary education. By 1998 the number of applicants admitted reached 53.8%. Also in 1998, within the framework of a $150 million World Bank loan, the government started consolidating state universities and colleges to maintain greater autonomy (EIU, 2000). The loan was provided for building renovation and construction, training university/college executives, and the implementation of a school loan program. In 1998 the government eliminated college tuition fees, making university education available for a greater number of applicants. In 2004 higher education enrolment reached about 60% (vs. 45% of OECD average) (EIU, 2007).

FDI distribution by sector, country of origin and the impact on the economy

In the late 1990s, the Czech Republic and Poland overtook Hungary's leading position (FDI inward inflow) due to privatization. After 1995, the amount of FDI into Hungary started to decline, a drop that deepened in 2000-2003 before regaining its momentum in 2004 and reaching the record high amount of $6.7 billion in 2005 (UNCTAD, 2006). In 1993, Germany, the Netherlands, Austria and the United States accounted for the 71% of the FDI in Hungary, and 65% respectively by 2003. Japan was the leader among the Asian countries. Of the total amount of FDI, 40-50% went to the manufacturing sector (Kiss, 2007). The majority of companies with foreign ownership were established in machinery (electronics, telecommunications (sectors that Hungary was specialized as a member of COMECON block) and automotive). The entrance of top-tier MNCs influenced other companies in their decision to invest in Hungary. Since Suzuki opened its Hungary car assembly plant in 1992, 14 of 20 top-tier automotive companies began operations in Hungary. The greenfield investments were settled in industrial free trade zones. A cheap and available labor force was the driver that drew these companies into Hungary in the 1990s. In 1989-2001 the productivity growth was the highest in the CEE region (7.68%), followed by Poland (6.65%) and Slovenia (3.17%) (Fink, 2006). In 2003, the 43% of value added were produced by the companies with foreign ownership (Kiss, 2007). The 30% of Hungary's manufacturing workforce was employed by companies with foreign ownership.

In the early 2000s, the companies that entered Hungary as a low-cost destination moved their production/assembly units to other locations due to the sharp increase in wages (IBM (hard-disk drive manufacturing); Philips (cathode-ray tube monitor production) moved to China, Nokia abandoned its greenfield FDI monitor producing plant; and Kenwood closed its factory) (BBC News, 2004; Szanyi, 2002, EIU, 2007).

However, in 2006 and the first half of 2007, Hungary was still considered an attractive destination for top-tier high and medium high-tech MNCs. Philips, Samsung, Bosh, GE, IBM and Sanofi-Aventis moved their units from the Western Europe to Hungary, increased production capacity, or established new facilities and R&D centers (ITD, 2007). According to EIU (2007) "*these same companies and many others continue either to move operations to Hungary or to expand their existing activities*". The number of Asian electronics companies relocated production capacity to Hungary to serve EU member states.

Emerging R&D Powerhouse for MNCs

In the 1990s R&D expenditures dropped tremendously, reaching 0.7% of GDP and remaining at that level until 1999 (Havas, 2002). However, the low amount of R&D spending wasn't reflected in the relatively strong innovation performance of Hungary. From 1996-2000, 196 patents were registered in the US (Havas, 2002), and in 2005, 45 patents were granted (WEF, 2006). In 1996-2000, the number of R&D units in universities increased by 27%, while the number of R&D units in businesses more than doubled (Havas, 2002). The R&D spending of MNCs accounted for 45% of the total industrial R&D spending in 1997 (Szanyi, 2002), and in 2003 the MNC affiliates business R&D spending accounted for more than 62.5% of the total R&D spending (UNCTAD, 2005).

The MNC's that entered Hungary as a cheap assembling destination went trough 2 phases: first, "*takeover or establishing the capacities*", accompanied by discovering R&D potential; and second, extensive use of the available potential starting from the mid-1990s. One of the factors affecting MNC's decisions was the quick adaptation to new/modern technologies by the highly skilled Hungarian workforce. The MNCs participated in workforce development initiatives, including own staff training and MNC-university collaborations, and started to increase R&D activities in Hungary (Szanyi, 2002).

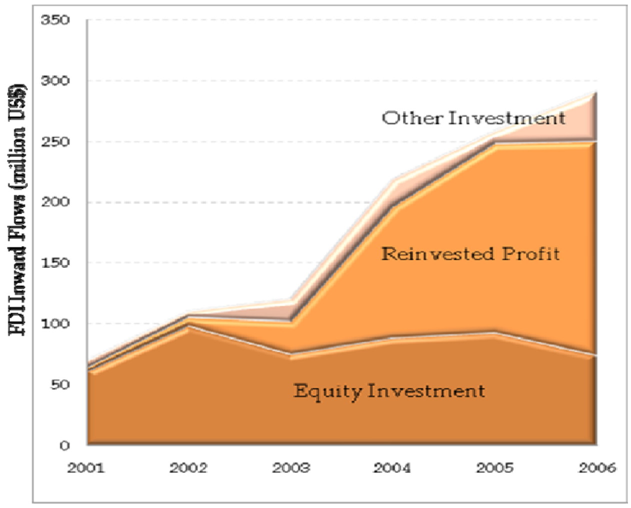
Conclusion

Although Hungary managed to attract efficiency seeking FDI of top-tier MNCs in the first half of the 1990s due to proximity to the EU, low costs, fiscal incentives reforms, and legal changes, these factors were no longer considered the main appealing factors for MNCs by the early 2000's. Hungary attracted higher value processing and R&D business due to a conscious shift to nurturing highly skilled technical specialists, engineers, and R&D institutes serving global MNCs. This was accomplished through financial incentives provided to MNC's by the state, and by a substantial improvement of the quality of higher education. As a result of these changes, Hungary has become a key destination for housing competence and expertise of global players and to a large degree hedge against throat-cutting cost-based competition.

IV. ARMENIA'S FDI STANCE AND PERFORMANCE AGAINST COMPARATORS

As predominantly a resource-intensive exporter[14], Armenia is currently facing the challenge to move to the investment-driven stage of economic development. Increasing the influx of domestic and FDI are considered to one of the main challenges facing Armenia. Despite the impressive economic growth in recent years, the structure of the growth reveals key fundamental economic issues. The growth has been mainly attained by substantial private transfers from abroad, and by large infrastructure building projects financed by international and Diaspora organizations. Massive private transfers fueled explosive growth in the construction sector, which has been supported by demand from the Diaspora. Import substitutions and export growth have played a lesser role. Though increasing the overall prosperity levels and supporting small domestic industries, these developments don't stimulate the growth of strong internationally competitive clusters. Given its small domestic market size and severe transportation and resource constraints, one of the key strategies for economic growth can become attracting technology-oriented foreign direct investments. During 2003-2006, the CAGR of FDI was 24.4%, although this was mainly driven by reinvestments (see Figure 7). Net inflow of equity investments didn't exceed $100 million in 2001-2005, and only a few new large entrants were observed.

Figure 7. FDI trends by components in Armenia, 2001-2006



Source: NSS, various years

From 1998-2006, the major FDI recipients were the Telecommunications (20%), Mining (16.9%) and Energy, Gas, and Water (15.8%) sectors[15]. If the current trends continue, Armenia will soon exhaust its potential to attract even resource-driven FDI in new spheres. Beyond other sectors oriented towards import substitution and specific niche markets such as food and beverages, the most promising sectors could be IT and R&D, which has recently experienced tremendous growth in terms of total revenues and FDI inflows. These sectors attracted $54 million from 1998-2006, about 3.5% of total FDI accumulated by all sectors of the economy. Without considering investment in infrastructure (telecom, electricity/gas/water and airport), IT and R&D is the fourth largest recipient of FDI after mining, food processing, trade and precision engineering. The high-tech and medium high-tech R&D spending MNCs could be considered the most likely targets for FDI in Armenia in the near future.

Table 6. FDI sectoral distribution in 1998-2006 (thousands of USD)

Industries	FDI inflow 1998-2006	Share in Total, %
Telecommunication	320827,4	20,4
Mining	266519,2	16,9
Electricity/Gas/Water Generation and Distribution	250985,8	15,8
Food/Beverage/Tobacco	173135,9	11,0
Wholesale and Distributive Trade	80495,6	5,1
Air Transportation Activities (incl. Airport construction)	69510,7	4,4
Precision Equipment[16]	58494,2	3,7

[14] In 2006, the share of resource-intensity of merchandise exports comprised 69.5% (Source: EV, 2007. "Armenian National Competitiveness Report", to be published in January, 2008)
[15] Source: National Statistical Service of Armenia (NSS)
[16] The biggest share in this investment counts for "Mars" company which was included in the equity swap deal with Russia in 2003.

Industries	FDI inflow 1998-2006	Share in Total, %
IT and R&D	53766,5	3,4
Hotels & Restaurants	43424,6	2,8
Construction	39007,4	2,5
Financial Intermediation	26539,7	1,7
Furniture	21376,4	1,4
Chemicals	16433,4	1,0
Metal Processing	13556,1	0,9
Other	140848,1	9,1
Total	1574921	100,0

Source: NSS, various years

Before the 2006 acquisition of the 90% of shares the Armenian national telephone company, ArmenTel, by the Russian mobile operator, Vimpelkom, from its Greek owner OTE, Greece was the first among FDI source countries in Armenia. At the end of 2006, Russian investments accounted for one third of FDI stocks, making Russia one of the main source countries of inward FDI, followed by Germany (11% of the total stock), attributable to the large copper mining investment deal with German Chronimet company. Other important source markets were the United States, followed by Canada, France, Greece, Argentina and the United Kingdom - countries with relatively strong, established and affluent Diasporan communities that play a significant role in generating and attracting investments. The investment climate and FDI regime in Armenia is described in Appendix 2.

Table 7. FDI home countries distribution in 1988-2006 (thousands of USD)

No	FDI Source Countries	1998-2006	Share in Total
1	Russia	558346	32,6
2	Germany	186673	10,9
3	USA	155185	9,1
4	Canada	144977	8,5
5	France	134222	7,8
6	Greece	85036	5,0
7	Argentina	72838	4,3
8	UK	65315	3,8
9	Cyprus	54973	3,2
10	Luxemburg	36129	2,1
11	Switzerland	28192	1,6
12	Lebanon	21277	1,2
13	Belgum	17473	1,0
14	Finland	16802	1,0
15	Italy	13741	0,8
16	Netherlands	13425	0,8
17	Other	105796	6,2
	Total	**1710398**	**100,0**

Source: NSS, various years

Benchmarking Armenia against Israel and Hungary

Methodology

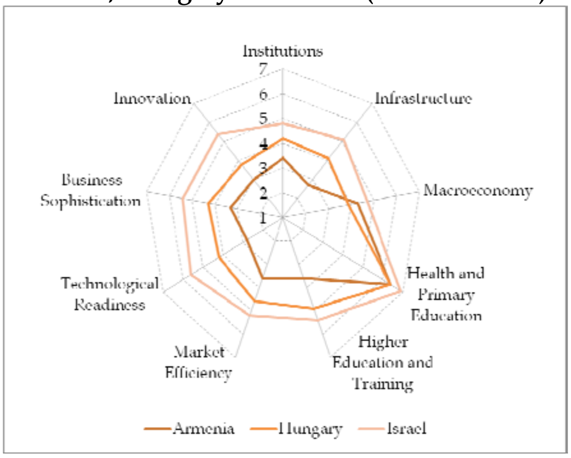
For the purpose of benchmarking Armenia's performance against Israel and Hungary, we used the policy dimension offered by the UNCTAD (2005) and adapted from Liang (2004) regarding national innovation systems and FDI in R&D. However, since the main emphasis of the research is attracting MNCs to Armenia and the stress is on the strengthening of the elements of the national innovation systems over the long-run, Armenia's performance against Israel and Hungary was benchmarked in areas that are considered the most crucial in attracting higher value processing and R&D FDI. For the benchmarking of Armenia's relative performance against its two main comparator countries, we used scores and indexes applied in calculating the Competitiveness rankings of individual countries by the World Economic Forum in the Global Competitiveness Report 2006-2007. These variables provide a holistic approach in our gap analysis, since scores and rankings are based on the executive opinion surveys conducted among CEOs of leading domestic companies and subsidiaries of MNCs operating in each host country.

Competitiveness Analysis

Compared to Israel and Hungary, Armenia performs well in terms of macroeconomy and health and primary education. However, Armenia lags behind its main comparators in higher education and training, technological readiness, and innovation. The comparatively poor performance in infrastructure is attributed to the lack of port facilities, communication and other types of infrastructure.

Since the one of the major factors affecting the decision of MNCs to attract higher value processing and R&D to a particular destination is the availability of skilled technical specialists and scientists, the higher education pillar was benchmarked again the main comparator countries.

Figure 8. Competitiveness assessment of Armenia, Hungary and Israel (Score out of 7)



Source: WEF, 2006

Table 8. School enrollment, tertiary (% gross)

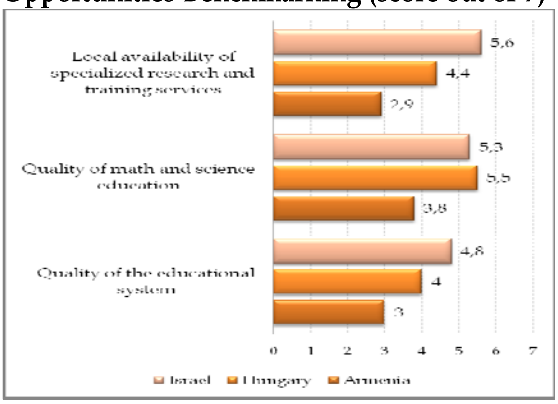
Country	1999	2000	2001	2002	2003	2004	2005
Armenia	23.7	23.6	24.9	26.4	25	26.2	28
Hungary	33.2	36.7	40.2	44.7	51.9	59.6	65.2
Israel	48.4	49.7	52.1	57.1	57	56.5	57.9

Source: WB, WDI-Online, October 2007

The gross tertiary enrolment ratio in Armenia has increased slightly from 23.7% in 1999 to 28% in 2005. In Hungary, the removal of tuition fees for first time students seeking bachelor degree paid off in tremendous rise of the number of students enrolled in university programs. In the early 2000s, the Israel tertiary enrolment ratio remained nearly at the same level. However in 2004, the highest science and engineering enrollment was reported in Israel (29.6% vs. 18.7% in Hungary and 6.5% in Armenia) (WB, 2007). This reflects the fact that Israel enjoys high concentration of high tech MNCs conducting corporate R&D in Israel (Microsoft, Oracle, Intel, SAP, National Semiconductor, Pfizer, IBM, HP, Boston Scientific, GE Medical Systems, Cisco, Sun Microsystems, VERITAS Software, etc).

Since the availability of the highly skilled engineers and scientists is one of the preconditions for a country to emerge as a higher value processing R&D powerhouse, the quality of educational system, especially math and science education, determines the success of each country in its efforts to attract high-tech MNCs. Hungary is the leader in quality of math and science education, which explains the rise of country as an R&D center in the last couple of years. To boost the innovative potential of their labor-forces, the governments of Hungary and Israel offer subsidies and tax incentives to employers in cases of cooperation with academia and

Figure 9. Quality of Education and Training Opportunities Benchmarking (score out of 7)

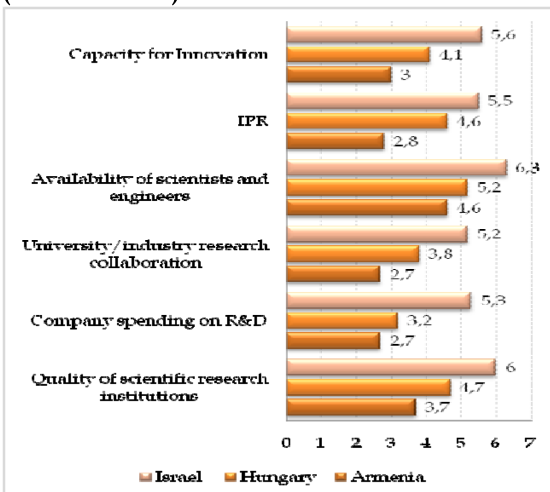


Source: WEF, 2006

trainings in workforce development initiatives thus creating demand for specialized research and training services (See Table 9).

Benchmarking Armenia's innovative performance against its comparators confirms the role of scientists and engineers in attracting MNCs. In case of Armenia, even though the executives reported that in Armenia engineers and scientists are available (mostly educated in the Soviet times), the quality of scientific institutions is far behind it main comparator countries (WEF, Executive opinion survey, 2006). The limited extent of research collaboration between academia and industry indicate that the knowledge generated by researchers is not absorbed by industry in Armenia. The low level of business sophistication, technological readiness and company spending on R&D results in insufficient demand for innovation. Scarce R&D financing, Armenia's aging academic population, and extensive brain-drain during last decade negatively affects the quality of R&D in the country. In addition, Armenian scientists and engineers lack necessary infrastructure and skills for technology commercialization and patenting abroad to raise venture capital. The state support in this field is insignificant. The law on State Support of Innovation Activities was adopted only in 2005, but the amount allocated in the state budget is quite low ($570,000 for 2007)[17]. In Hungary, CEOs reported that local companies are not spending much on R&D vs. MNCs operating in Hungary. Israel is a distinct leader in patent development, with 137.9 utility patents per million people in 2005. This can be attributed to high R&D investments amounting to 4.7% of GDP in 2005 (Planetanalog, 2007).

Figure 10. Benchmarking of Innovation Factors (score out of 7)



Source: WEF, 2006

In Armenia, both the number of researchers and spending on R&D has decreased tremendously. In 1990, a 2.5% R&D spending to GDP ratio made Armenia the second largest spender after Russian Federation (about 3%) among former USSR republics. About 25,000 scientists and engineers were involved in R&D activities. In 2005, R&D spending comprised 0.23% of GDP (UNESCO Statistics Division, 2007), employing about 6,700 people (Arzumanyan, 2006). Despite very small R&D expenditures and a small number of people involved in R&D activities, Armenia was ranked 55th among 125 countries in terms of US utility patents registration (WEF, 2006). In selected fields such as physics, information technologies and biotechnologies, Armenia still has a potential which is mostly utilized through bilateral or multilateral international research projects (International Science and Technology Centre, US Civilian Research and Development Foundation and its Armenian affiliate National Foundation of Science and Advanced Technologies, NATO Science Programme, INTAS, and others) (Arzumanyan, 2006).

MNCs consider Intellectual Property Rights (IPR) as an important factor in determining the location of R&D investments (A.T. Kearney, 2005; UNCTAD, 2005). The benchmarking of Armenia's performance found that the IPR in Armenia is weak. However, this factor is not prohibitive for attracting R&D FDI as proven by China, where IPR is one of the lowest in the world but the country attracts considerable FDI in R&D areas.

In terms of tax/R&D incentives and workforce development, Armenia seriously lags behind Israel and Hungary, both of which offer a wide range of incentives and subsidies to companies by stimulating private investments in R&D and workforce development. Table 12 provides a list of incentives, subsidies, and other initiatives undertaken in Armenia, Hungary and Israel.

[17] Government decree on 2005-2010 program for innovation system creation adopted in 2005

Table 9. Armenia vs. Hungary and Israel

Factors	Israel	Hungary	Armenia
Incentives	**Investment Incentives** Approved or Beneficiary enterprise status based on the location investment area to be eligible for getting grants of up to 24% of tangible fixed assets, and or reduced tax rates, tax exemptions, and other benefits. **R&D Incentives** • *Conditional grants of up to 50% of the R&D cost* • *Bi-national funds* Company is granted of 50% of Industrial R&D project full cost and overhead; in case of universities 100% of the additional costs and 20% of overhead • *Global Enterprise R&D cooperation Framework* Financial assistance of 50% of the Israeli company's R&D approved costs • *The technological Incubators* Grants of up to 85% of the approved cost • *The Heznek Seed Fund* Grants of up to 50% of the approved work program • *The Tnufa Program* Grants of up to 85% of the approved expenses for a maximum of $50,000 for each project to support individual entrepreneur • *The Magneton and Noffar Programs* Grants of up to 66% and 90% of the approved cost to support applied academic research • *The Magnet Program* Grants of up to 66% of the approved budget to support the formation of consortia of individual firms and academic institutions.	**Tax incentives** • In January 2004, the corporate tax was lowered from 18% to 16%. • Cash subsidy (approved and granted by the government decision) The subsidies are provided in case of investments amounted to at least €10 million (2.5 billion HUF) in manufacturing, R&D, and Regional service centers. The subsidies are provided in case of employment generation projects. The amount of the subsidy is subject to the government decision. • Development tax allowance Investment volume and job creation potential The investor is granted an 80% tax exemption effective within 10 years after the completion of the investment project in cases of €12 million investments, or in preferred regions, investments of €4 million. **R&D Incentives** • 100% RTD corporate tax allowance (applicable in case of subcontracted R&D activities carried out in partnership with a public/non-profit research site) • 300% RTD tax allowance (in case of R&D activities carried out in the corporate lab at the premises of the public R&D institution or University) up to 50 million HUF • IPR tax allowance • Investment tax credits: up to 25% of value of material assets • Depending on the size of the company, investment and location tax credits on investments were granted, (including R&D investments) • In case of hiring PhD, MSc or MBA students for educational and research activities the company was granted tax free employment (up to the official minimum wage). • Tax allowances were provided to companies donating	**Tax Incentives** Corporate tax deduction (100% for first 2 years and 50% for next 8 years) for companies with more than 1,5 million USD foreign investment (to be eliminated in 2009). Customs duty exempt for imported goods intended for increasing statutory capital **R&D Incentives** **R&D grants** Enterprise Incubator as a local institutional of the Science and Technology Entrepreneurship Program launched by the U.S. Civilian Research and Development Foundation, started providing small grants of up to $5000 for micro-venture-scientist R&D cooperation program

<table>
<tr><th>Factors</th><th>Israel</th><th>Hungary</th><th>Armenia</th></tr>
<tr><td></td><td></td><td>
to organizations contributing to R&D activities (20% of net turnover)
Upon creation of intellectual property, granting of tax credit from personal income (up to 50,000 HUF)
EU co-funded tenders
Subsidies are provided for
Start-up investments
Corporate R&D center development
Logistics and service center development
Regional support center development

</td><td></td></tr>
<tr><td>Educational/ Workforce Development Initiatives</td><td>
Training support program
Plant Class-the government supports the training of workers in specific skills if the employer hires at least 50% of the class.
Training and Placement Class- the government fully covers the cost of running training for workers in specific disciplines and professions if the employers hire at least 50% of class graduates with 6 months upon completion of the class.
Internal Plant Training- the government supports on-the-job training program in the workplace by covering about $300 per worker
First-class Universities
Creation of first-class educational and scientific research establishments upon founding of the state of Israel.
</td><td>
Training Subsidy Program
The Hungarian government grants individual subsidies depending on the size of the company and the type of training (general (accredited); and designed for company needs) plus additional incentives in case of trainings in different regions (preferred and non-preferred) and for the disabled.
Large company
<table>
<tr><td>50%</td><td>General (accredited) training</td></tr>
<tr><td>25%</td><td>Specialized (company-tailored) training</td></tr>
<tr><td>+10%</td><td>Training of disadvantaged employees (pro rata)</td></tr>
<tr><td>+10%</td><td>Outside Budapest and Pest County*</td></tr>
<tr><td>+5%</td><td>In Budapest and Pest County</td></tr>
</table>
SMEs
<table>
<tr><td>70%</td><td>General (accredited) training</td></tr>
<tr><td>35%</td><td>Specialized (company-tailored) training</td></tr>
<tr><td>+10%</td><td>Training of disadvantaged employees (pro rata)</td></tr>
<tr><td>+10%</td><td>Outside Budapest and Pest County*</td></tr>
<tr><td>+5%</td><td>In Budapest and Pest County</td></tr>
</table>
Source: ITDH
Tertiary enrolment boosting initiatives
The post-1998 government cancelled tuition fee for first time students obtaining their first degree.
</td><td>
Workforce Development Initiatives
The National Foundation of Science and Advanced Technologies was established in 1997 (funded by international donors) to promote and develop the scientific and technological potential of Armenia by providing grants. The Foundation initiated the following programs
University Centers of Excellence Program 2007: the objective is to make research a part of academic curriculum, and to provide students and junior scientists with access to modern lab facilities
Graduate Research Support Program 2006: 12-month support of up to $5000 to post graduate students for career advancement
</td></tr>
<tr><td>Infrastructure</td><td>
Technology Incubators
24 technology Incubators with $30 million budget, each conducting on average 10 projects (2006)
</td><td>
Industrial Parks
More than 160 operating industrial parks. Companies that operate in the parks undertake R&D initiatives, and
</td><td>
Business Incubators
Enterprise Incubator Foundation
Funded by the World Bank Enterprise Incubator
</td></tr>
</table>

Factors	Israel	Hungary	Armenia
	Venture Capital Yozma Program (1992)– triggered the establishment of venture capital market. Major US/EU venture capital funds operating their braches in Israel (Silicon Valley Bank, Accel, Benchmark, Apex, Advent, Alta-Berkley, etc) and contributing to over 65% of the total FDI from 1995-2004.	cooperate with universities and academic institutions of Budapest, Miskolc, Debrecen, etc. **Science & Technology Parks** **Innotech Innovation Park of the Technical University** The Park promotes technological advancement based on intellectual potential available at the Budapest University of Technology and Economics. The Park functions as a business incubator for the start ups as well. **InfoPark** The Park invests in the training and developing of the next generation of scholars, functions as a business incubator, and initiates cluster building activities. The tenants of the InfoPark are HP, IBM, and Panasonic **Pécs Industrial Park** In 2001, started the construction of the Institutional Centre, a multifunctional building hosting Innovation and Technology Development Centre of the region, and functioning as a business incubator.	Foundation, it was established in 2002 to support IT companies of Armenia and increase their competitiveness in the global market, and to strengthen business-research collaboration and promote business start-ups **ViaSphere Technopark** ViaSphere was established in 1998 as an incubator headquartered in Sunnyvale, California. Founded on the base of former Soviet large "Transitor" company by the Diasporan investor, it provides space and infrastructure to companies operating in high-tech and software development field**.**

Source: http://www.moital.gov.il/NR/exeres/B0B48981-357D-446F-AFAC-91A358E93C87.htm
http://www.investinisrael.gov.il
http://www.iva.co.il/content.asp?pageId=44
http://www.itdh.com/engine.aspx?page=investment_incentives
http://www.itdh.com/engine.aspx?page=Itdh_IndustrialParks
http://www.nkth.gov.hu/main.php?folderID=891&articleID=3943&ctag=articlelist&iid=1
http://www.innotech.hu/eng/frame.html
http://www.infoparkrt.hu/modules.php?name=Content&pa=showpage&pid=6
http://www.pip.hu/en/index.html
http://www.nfsat.am
http://www.viasphere.com
Lopez-Claros, Augusto; Mia, Irene, 2006. "Factors in the Emergence of an ICT Powerhouse", World Economic Forum, "The Global Information Technology Report 2005-2006: Leveraging ICT for Development", Hampshire: Palgrave Macmillan

IV. CONCLUSIONS AND PROPOSED MEASURES

The competition for attracting FDI is getting tougher and tougher. FDI incentives, targeted promotion are becoming widely used by new countries striving to become attractive FDI destinations. The standard measures of improvement of business environment and commonly used incentives are only necessary pre-conditions for attracting FDI. However, nations which succeed have offered unique features and attractions to global players that create high value products for global markets.

Armenia still has to match its competitors in providing comparable business environments and incentives, and on the same time it must strive to create unique, differentiating elements of its holistic value proposition to get better bargaining position for attracting high value added elements of MNCs global value chain. Therefore, the necessary measures aimed at attracting global technology MNCs can be divided into two groups or layers of activities titled here as Matching the Best Practice and Creating Unique Proposition. Layer One measures shall aim at creating comparable to other alternative destinations attractive conditions for MNCs, while Layer Two measures shall create set of factors, resources and competences that may be specific to Armenia and will differentiate it from other destinations.

Layer Two	Creating Unique Proposition
Layer One	Matching the Best Practice

Layer One Measures: Matching the Best Practice

Incentives:

1. Provisions for tax incentives or tax exemptions for high tech companies involved in innovative product design and production.
2. Provisions for R&D grants and subsidies for high-tech companies. Even though the law on the State Support for Innovation Activities was passed in 2005, it currently doesn't offer any notable R&D incentives for private sector. The state budget now supports only outdated academic research institutions that do not meet the urgent need of the private businesses.
3. Provisions for joint grants and tax credits to initiate cooperation between academia and private enterprises to encourage university and private sector R&D partnership programs.

Infrastructure:

4. Create free industrial zones or science & technology parks with necessary infrastructure.
5. Create educational centers for equipping scientists and engineers with knowledge of modern management, marketing and other disciplines to register patents in foreign countries and eventually commercialize the inventions.

6. Upgrade the quality of public schools, improve the quality of math and science education, create modern science (physics, chemistry, biology) labs in secondary schools to stimulate the interest of students in natural sciences.
7. Create technology/science vocational training centers for science graduates to equip them with modern knowledge of the field.
8. Create a state supported innovation fund aimed at investing in prospective technology oriented start-ups. The fund may be open also to private money. The fund can stimulate the formation of the venture capital industry in Armenia by providing co-financing and risk sharing, as well as technical assistance through other mechanisms of state support. The successful ventures may become potential targets for MNCs, especially in R&D fields.

Layer Two Measures: Creating Unique Proposition

1. Develop the current labor pool of scientists/engineers in targeted areas and equip them with unique competences through:
   - Creating technology/science vocational training centers for science graduates.
   - Creating world-class laboratories at technology/science departments at leading Armenian universities.
   - Upgrading the university science/engineering curriculum with the involvement of leading Diaspora scholars and specialists.
   - Providing scholarship and tax incentives to the employers who conduct training for university graduates who later would be hired at the same companies.
   - Investing in the training of university professors.
2. Actively involve the networks of the Diaspora executives and professionals to gain access to top executives of targeted MNCs. Armenia is uniquely positioned to use its global Diaspora network in different countries for more proactive FDI attraction. The Diaspora can also be involved in upgrading the university curriculums, developing the faculty skills, and other measures of the Layer One.
3. Form an alliance of MNCs currently operating in Armenia to help promote Armenia in foreign countries.
4. Accelerate the negotiations with Iran to move to free trade agreements to provide Western MNCs with access to the large, but currently protected Iranian market in selected areas.

Armenia needs very proactive, even aggressive promotion of Armenia in other countries. However, the promotion should be very focused and targeted. This requires new sets of skills and institutional capacities. The institutional framework of FDI promotion needs a fundamental upgrade in terms of attracting experienced managers with international experience and relationships with key decision makers, the creation of representations abroad, provisions for necessary resources and competencies, and the overall coordination with other state institutions in Armenia.

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BBC News: http://news.bbc.co.uk/1/hi/business/3662785.stm

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Forrester: http://www.forester.com

Gartner: http://www.gartner.com

Corporate web sites of the selected MNCs

APPENDICES

Appendix 1

Table A.1. Most-favoured locations of top 100 MNCs from developing and developed countries lists

For largest world MNCs		For largest developing-country MNCs	
Economy	**Location intensity***	**Economy**	**Location intensity**
United States	92.0	United States	50.0
United Kingdom	91.0	Hong Kong (China)	33.9
Netherlands	89.6	United Kingdom	33.7
Germany	87.4	China	30.0
France	83.5	Singapore	26.4
Italy	81.4	Netherlands	25.0
Brazil	81.0	Japan	22.5
Belgium	80.0	Malaysia	20.3
Switzerland	79.4	Canada	16.2
Mexico	78.0	Australia	15.0
Canada	77.3	Germany	15.0
Spain	76.4	Cayman Islands	13.7
Singapore	73.7	Taiwan Province of China	13.2
Poland	72.0	Virgin Islands, (UK)	12.5
Japan	70.3	Bermuda	11.2
Czech Republic	70.0	France	11.2
Australia	69.7	Brazil	10.4
Argentina	68.0	Belgium	10.0
China	66.0	Mexico	9.5
Hong Kong (China)	65.6	Poland	8.8
Austria	64.0	Czech Republic	7.5
Portugal	64.0	Italy	7.5
Denmark	61.0	Spain	7.5
Finland	55.1	Korea, Republic of	6.7
Hungary	55.0	Austria	6.2
Sweden	54.5	Colombia	6.2
Luxembourg	54.0	Denmark	6.2
Russian Federation	54.0	Panama	6.2
Malaysia	53.5	Sweden	6.2
Norway	53.5	Switzerland	6.2
Venezuela	52.0	United Arab Emirates	6.2
Turkey	50.0	Argentina	5.0
Korea, Rep. of	49.5	Chile	5.0
New Zealand	49.0	Hungary	5.0
Taiwan Province of China	49.0	Nicaragua	5.0

Source: UNCTAD, 2006; *total number of MNCs with at last one affiliate in a hoist economy divided by 100 and minus and minus the number of MNCs from that country listed in top 100

Appendix 2

Table A.2. List of countries that attracted most R&D and manufacturing units of selected MNCs

No	Countries	Number of MNCs having R&D center in the country	No	Countries	Number of MNCs having Manufacturing units in the country
1	USA	18	1	USA	19
2	China	17	2	Mexico	18
3	Japan	16	3	Brazil	17
4	UK	15	4	China	17
5	India	11	5	Germany	16
6	Germany	10	6	France	15
7	Hungary	10	7	UK	15
8	Israel	8	8	Singapore	14
9	France	6	9	Malaysia	13
10	Italy	6	10	Philippines	13
11	Switzerland	6	11	Japan	12
12	Poland	6	12	Spain	12
13	Malaysia	6	13	India	12
14	Australia	5	14	Venezuela	12
15	Belgium	5	15	Ireland	11
16	Netherlands	5	16	Argentina	11
17	Hong Kong	5	17	Korea	11
18	Singapore	5	18	Canada	10
19	Canada	4	19	Italy	10
20	Spain	4	20	Hungary	10
21	Russian Federation	4	21	Indonesia	10
22	Brazil	4	22	South Africa	10
23	Korea	4	23	Thailand	10
24	Taiwan	4			

Appendix 3.

Investment climate and FDI regime

Investment regime

The government of Armenia is promoting foreign investment and carrying out an "open door" policy. The main law regulating the field of FDI is the Law on Foreign Investment adopted in 1994. With small changes it is still considered the main regulatory act. This law and other FDI related provisions of Armenian legislation, complemented with bilateral and multilateral international investment agreements, comprise an investment regime for foreign investors that is quite liberal and includes the following incentives:

- Equal treatment for both foreign and domestic investors
- 100% foreign ownership is permitted
- No limitations on size and type of foreign ownership (except for the rights to own land by foreign citizens)
- Special investment incentives for foreign investors (corporate tax and customs duty exemptions)
- Alternative dispute resolution mechanisms for foreign investors (ICSID)
- Guaranties for legislative changes (five-year "grandfather-clause")
- No restrictions for capital and revenue transfer and repatriation
- Liberal regime on employment of foreign workforce.

Fiscal incentives: if the investment exceeded the threshold amount of 500 mln. AMD, the investor is corporate tax exempt, while providing locals with no such incentives. Foreign investors were granted

The Armenian Government has signed investment protection and promotion treaties with 37 countries including the USA, Germany, Russia, and France, providing additional guaranties to foreign investors/investments. Additionally, to avoid the double taxation of income and property, Armenia has signed bilateral treaties with 24 countries.

Business stimulation / subsidies

According to the Armenian legislation, the tax privileges are provided only by the law. There are very few tax incentives and subsidies (e.g. customs duty exempt for imported goods intended for increasing statutory capital; subsidized gas prices). Currently, the Armenian Government's support to the private sector is provided under SME development and innovation promotion schemes. However, the allocated resources are still limited and targeted to the small and medium businesses in the rural areas and a few innovative companies in Yerevan.

Administrative infrastructure

The Armenian Government has successfully implemented reforms to make the regulatory framework more business friendly. Recently simplified state registration and licensing procedures have significantly reduced the time and efforts spent by companies. For standard cases, state registration can be done within a day, and a business license can be issued and granted within three days. The number of procedures to get a license has been dramatically reduced for the investors registering a company in the fields of telecommunications, transportation and construction services, food processing, health care services and pharmaceuticals, banking and insurance, energy generation and utilities.

Although law enforcement has also improved, it is still far from being satisfactory. Private businesses have complaints about cases of bureaucratic delays, non-efficient and impartial court decisions, red tape, and unfair treatment by tax inspectors and the customs house.

Monopolies and market regulation

The competition in the local market varies across industries. Beyond the natural monopolies regulated by the Public Services Regulatory Commission (PSRC), there are sectors where a few large players control the market, including import of petroleum, sugar and wheat, and production of salt, tobacco, cement, and mobile telecom services. However, the majority of sectors, especially services and export-oriented, are benefiting from strong competition in the market. While the legislative (Law on Protection of Economic Competition adopted in 2000) and institutional framework is quite developed (State Commission on Protection of Economic Competition), there has been limited success in enforcing/implementing measures aimed at promoting competitive environment in some industries.

Physical infrastructure

The physical infrastructure in Armenia, especially roads (with funding from major international and Diaspora-funded programs), electricity supply, telecommunications and air transportation, has improved significantly over the past 10 years. Mobile telecom has been booming since the monopoly on mobile services was removed in 2004 and a new mobile operator entered the market. However, there are still considerable bottlenecks, such as a low Internet penetration rate, an inadequate railroad infrastructure, as well as limited number of ground transportation routes to major exporting destinations (Armenia is connected to the world only through ground transportation routes via Georgia and Iran).

Trade regime and regional economic cooperation

Armenia has a liberal foreign trade regime with a simple two-band import tariff (0% and 10%), no taxes on exported goods/services, and no restrictions on exported and/or imported volumes. Import, export and domestic production licenses are required only for meeting health, security and environmental standards/requirements. There are no limits or restrictions on hard currency exports. Excise taxes are charged (different rates applied to different products) on imported luxury goods and in cases of their domestic production (alcohol, tobacco, caviar, petroleum, precious stones and furs).

Armenia became a full member of WTO at the end of 2003. Armenia enjoys a free trade regime with CIS countries. Within the framework of the EU Neighborhood policy, Armenia is in the process of receiving a favorable trade regime GPS+ for domestic producers exporting to EU markets.

Although the customs legislation is, in general, compliant with WTO requirements, there are still loop-holes in the administration of the regulations in cases such as customs valuation of imported goods (the invoice value is applied in very rare cases).

The share of regional neighbors in Armenia’s foreign trade turnover is remaining negligible due to geopolitical and tight relations with its neighbors. From 2001 - 2006, this share decreased slightly from 12% to 10%. These factors, coupled with a small domestic market size, has eliminated Armenia’s chances to be considered as a regional hub in case of market seeking FDI.