Israel's Intellectual Capital: Key Factor for Its Competitive Edge in World Market

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In the absence of natural resources, reliance on human capital and knowledge has been the most fitting and natural choice for the Israeli economy. Education, R&D and technological innovation are the key success factors to the nation's economic and social development as well as the basis for its natural strength.

Japan and Israel have a common destiny to go through globalization by the above-mentioned intellectual capital. I hope that the following description of the Israeli intellectual capital as its key factor for competitiveness would encourage Japanese business society to cooperate with the Israeli intellectual capital community.

The intellectual capital of a nation is a combination of its market capital, process capital, human capital (all together symbolizing the present), and renewal & development capital (symbolizing the future).

Market Capital

Market capital reflects the intellectual capital embedded in Israel's relations with other countries. The intellectual assets in this area are derived from Israel's capabilities and successes in providing an attractive, competitive solution to the needs of its international clients.

Openness to globalization and the flexibility and adaptability of Israeli companies to the dynamic global market reflect the resilience of the Israeli economy and its core capabilities in market capital. All of these produce a basis for assessing the country's attractiveness in the eyes of international businesspeople and foreign investors.

The global market offers a great opportunity for companies and countries to tap into larger markets around the world. It means they can have access to more capital flows, technology and cheaper import and larger export markets.

Israel has exposed its domestic industry to foreign competition. Israel has concentrated on promoting exports, opening new markets and expanding existing ones. Israel's trade policy is enhanced by a wide range of trade agreements and commercial arrangements with countries and international institutions that enable Israeli exports to compete on the international market under fair conditions.

One of the most significant indicators used to examine a country's strength and stability is its flexibility and the extent of its adaptability to new challenges. Another important indicator is the resilience of its economy. Israel is highly ranked in terms of flexibility and adaptability of the actors within the economy when faced with new challenges. Israel has strong economic resilience to the economic cycle of busts and booms, as was shown in 2001 as well as these days of global crisis.

Process Capital

Cooperation and the flow of knowledge require structural intellectual assets such as information systems, hardware, software, databases, laboratories, national infrastructure and a management focus. Such structural intellectual assets sustain and increase the output of human capital.

Key process capital success factors for creation of know-how in Israel have been taken from various fields such as communications, education, agriculture, management, entrepreneurship, risk-taking, employment, immigration and absorption. These factors create the base of Israel's business infrastructure.

Israel has modern infrastructure:

- State–of-the-art telecommunications
- World-renowned research and educational institutions
- Highly advanced banking/financial sector
- Large volume of high-tech and science-based industry
- Supportive business environment
- Cutting-edge technology and scientific breakthroughs

Rapid and efficient communication makes it possible to shorten processes, receive information and knowledge in real time and quickly develop products and services. Unlike in many other business societies, Israeli companies are taking advantage of being able to access online information. Liberalization, deregulation, privatization and advanced technological development spurred the rapid growth of the telecom service sector in Israel.

Cyber security is an established discipline for computer systems used on business management. Cyber security for manufacturing and control systems includes protection against cyber or physical attacks on computer systems and their support. In Israel, there is high awareness of cyber security in organizations.

The Israeli government considers education an important measure for preparing the new generation for the future. Israel has world-class educational institutions. Research is carried out in Israel's universities, technical colleges and specialized research institutes. Six of the seven Israeli universities are ranked among the best in the world. There is strong collaboration between universities and industry, resulting in highly developed knowledge transfer between companies and universities.

The government offers generous incentives for entrepreneurs, including government funding for R&D projects, grants for foreign investment and tax deferment. In addition, Israel offers investors advantageous conditions that include an active capital market, a

strong banking system, a robust venture capital sector, relaxed currency regulations and comprehensive protection of trademarks, patents and other intellectual property. This legal environment and its support of technological development have helped develop an environment that supports scientific research. The government's supportive policy toward entrepreneurship is also evident by the simplicity of starting new businesses or start-up companies in Israel.

Israel is a member country in the ISO organization. Israel ranks within the top 10 in the number of organizations having certifications for medical devices satisfying the ISO 9001:2000 quality requirement. Israel is intimately aware of the need to conduct intensive research in the agricultural industry in order to generate new technological developments in this sector. Israel gradually started to invest more in technological agriculture products than in agriculture as a result of the country's limited natural resources such as water and fertile land.

As a result, there have been improvements in production technology and increases in farm yields despite the reduced significance of agriculture in the labor market and the diminishing availability of farmland. Israel's agricultural productivity in terms of GDP per person employed in agriculture is among the highest in the world.

Human Capital

Human capital includes knowledge, wisdom, expertise, intuition and the ability of individuals to realize national tasks and goals. This focal area also includes the values encompassed within the culture and philosophy of the nation. Human capital constitutes a population's total capabilities as reflected in education, knowledge, health, experience, motivation, intuition, entrepreneurship and expertise.

The human factor is the most important link in the process of value creation. Thus, the success of the process depends on the development and renewal of human resources. Israel has excellent human resources:

- A highly educated workforce
- A multilingual population with cultural, historic and business ties to almost every other nation.

Israel has a highly educated workforce along with first-class educational institutes. It has 140 scientists and technicians per 10,000 employees, more than any other developed country. Israel has 135 engineers per 10,000 employees, which is the most concentrated number of engineers in the world.

The Israeli vision rests on the principle of equal opportunity for all its citizens. The contribution of culture to the social climate and economy is having great importance. With a population of people from more than 100 countries, Israeli society is rich in cultural diversity and artistic creativity.

Health of the population as a component of human capital is measured by available resources for improving population's health. Israel stands in a respectable position compared to other countries of the industrialized Western world. The high life expectancy in Israel is a result of a number of factors including the general infrastructure of high-standard health services and the high quality of medical research and medical resources such as an exceptionally well-developed hospital network.

Photo: Embassy of Israel in Tokyo

Biotechnology is Israel's leading industury.

The medical system in Israel is rich in human resources, equipment and medical technology. The high level of health care and a relatively wide range of resources bolster Israel's policy of equality by enabling the country to provide a high level of medical care for all its citizens, including the poor.

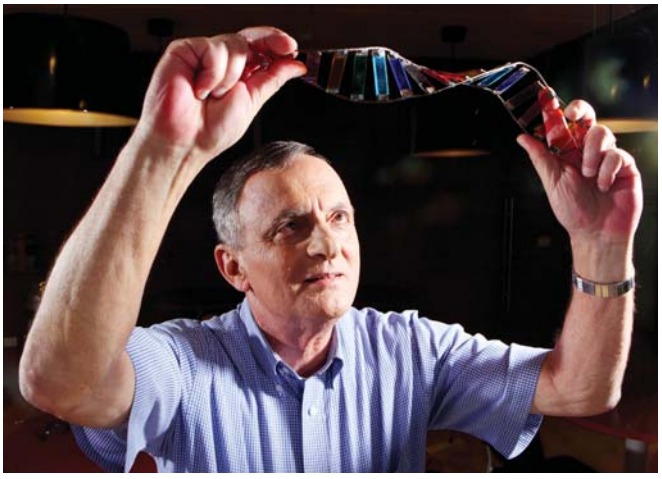
Renewal & Development Capital

Renewal and development capital refers to the nation's capabilities and real investments made in an effort to increase its competitive strength in future markets. Renewal and development assets include investments in R&D, patents, trademarks, start-up companies, etc. Renewal and development capital focuses on Israel's main potential for future growth.

In a dynamic environment, early identification of driving forces and their translation into business opportunities through scientific activity will lead to the country's future prosperity. During the years of its existence, Israel has made great contributions to scientific research and international cooperation.

Scientific research is one of the mainstays of Israel's growth. The country is one of the "laboratories" for brilliant ideas. This is evident

Photo: Embassy of Israel in Tokyo



Scientist and investor Dr. Benny Zeevi, watching a DNA model.

by the large number of Israeli companies (over 100) that are listed on the NASDAQ market. Israel is ranked second after Canada in the number of companies traded on the American Technology Stock Exchange.

Israel's competitive edge:

- Israel has been described as the "second Silicon Valley" in the world.
- Israel is one of the largest centers in the world for start-up enterprises, with more than 2,500 start-up companies.
- Israel's cutting-edge industries include agro-technology, biotechnology, computer-aided education, data communications, water technology, new energy technology and clean technology.

Israel has built a strong scientific community, dedicated to excellence and innovation. The extent and impact of active research in Israel is defined by two main criteria – the productivity of the scientific community and the quality of research as compared with the rest of the world.

Israel is ranked very high in the world in the number of scientific publications per million people, and this reflects productivity. Israel is ranked in the top 10 in terms of both productivity and quality in most of the scientific fields. Israel has developed national expertise in the most cutting-edge fields in science, and ranked in the top 10 in collaboration between its local academic institutions and industry in R&D.

Israel is ranked among the top five in terms of the number of patents per 10,000 people. This fact reflects also the knowledge transfer between academia and industry. Israel is also placed high in the rankings of European Patent Office (EPO) patent applications owned by universities. Utility of patents is measured by the number of patents for inventions. Israel ranks very high in the number of patents for inventions.

Israel is home to some of the world's leading biotechnology research centers. Between 150 and 200 new life science companies are established in Israel every year. Venture capital investment in Israeli life science companies is considered very high. There are 24 technology incubators in Israel, more than 20% of them involved in projects in the field of biotechnology. Israel is third in the world in terms of the number of biotechnology start-up companies.

In the last three decades, investment in R&D has led to a 30% increase in GDP. R&D is the key success factor in Israel's economic growth and the country's integration into the globalized world.

R&D is a vital, ongoing process in a knowledge-based industry. This process is capable of transforming new ideas into products of high added value within a short period of time. This innovation dynamic has the potential to shrink the balance of payments deficit, thus accelerating progress towards economic independence. Thanks to R&D, Israel enjoys a competitive edge in the world market despite its small size. The degree of innovation is a reflection of expenditure on civilian R&D. Israel was ranked first out of all developed countries in terms of national expenditure on civilian R&D as percentage of GDP, which in Israel is 4.55%

Israel's economic policy has created a climate that is conducive to venture capital investment by liberalizing foreign currency and by offering significant government incentives and tax breaks for investors. Israel is attractive to foreign investors because of its excellence in technology, particularly in the software, communications, security and biotech sectors.

Start-up companies and entrepreneurs with innovative but risky projects in Israel can easily find venture capital. Israel is ranked second in venture capital availability, preceded only by the United States. In the last few years, Israel has recognized the need to establish a system that includes entrepreneurs, venture capital funds, investors who furnish capital and a capital market in order to successfully attract risk capital. Therefore, professional investors are keen on investing funds in Israeli companies, and multinational companies seek to acquire technologies and companies in Israel.

The Israeli government supports more than 200 projects in government-funded incubators. There are 24 technological incubators in operation. A total of 1,000 projects graduated from these government incubators in the last decade, of which 57% have received further private investment. The government has also set up technology parks and implemented software development projects.

Israel has the third largest concentration of start-up companies in the world, preceded only by Silicon Valley and the metropolitan Boston area. These start-up companies provide Israel with its main potential for future economic growth.

It appears that the secret to the success of Israeli start-up companies lies in the quintessential characteristic of Israeli society — the ability to operate under conditions of uncertainty and rapid change, long a necessity of life in the country. Israeli entrepreneurs are blessed with traits vital to their trade such as willingness to take risks, the ability to make quick decisions, the ability to learn quickly and tremendous desire for success. As such, it is not surprising that Israeli companies are known for being innovative. **JS**

This article is based on the publication *"The Intellectual Capital of the State of Israel, 60 Years of Achievements"* published by the Chief Scientist Office in the Ministry of Industry, Trade and Labor, Jerusalem, 2008. You may acquire a free copy by contacting the Israeli Commercial Section in the Embassy of Israel, Tokyo (Tokyo@israeltrade.gov.il).

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