THE ISRAELI HIGH TECHNOLOGY ECOSYSTEM

1. OPEN ECONOMY STRONGLY ANCHORED IN WORLD MARKETS

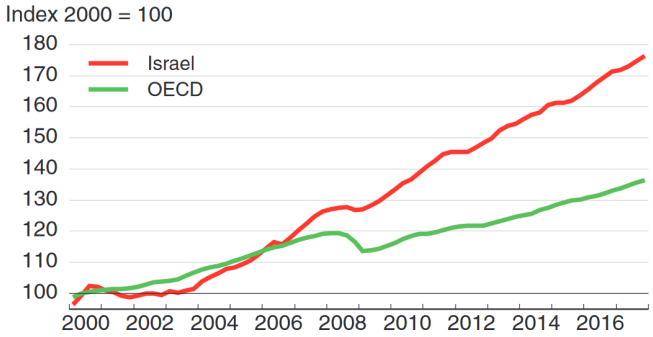
The strong trade and investment ties outside of the Middle East have insulated Israel's free-market economy from regional political instability.
Since its creation in 1948, Israel has seen remarkable developments, emerging from a low-income, and high-inflation developing economy in the 1970s to a medium to high-income advanced economy while at the same time being increasingly integrated into the world economy in trade and finance.

Trade is significant for Israel's economy; the combined value of exports and imports equals 57 percent of GDP. Israel has many free trade agreements with countries or group of countries;
The EU, the USA, EFTA, Mercosur, Turkey, Mexico, Canada, Jordan, Egypt.

Financial institutions offer a wide range of services. Capital markets are evolving as part of Israel's effort to reinvent itself as a regional financial hub.

Israel's economy is performing strongly and continues to register remarkable macro-economic and fiscal performance. Growth is strong and unemployment low. With low interest rates and price stability, financial policy is prudent, and public debt comparatively low and declining.
The external position is solid, thanks to a dynamic high-tech sector. The average standard of living is improving, mainly due to higher employment rates. Continued accommodative macro policies and planned investments in the offshore gas fields in the coming years will spur further growth. Against this backdrop, Israelis remain on average more satisfied with their lives than residents of most other OECD countries.

Real GDP developments

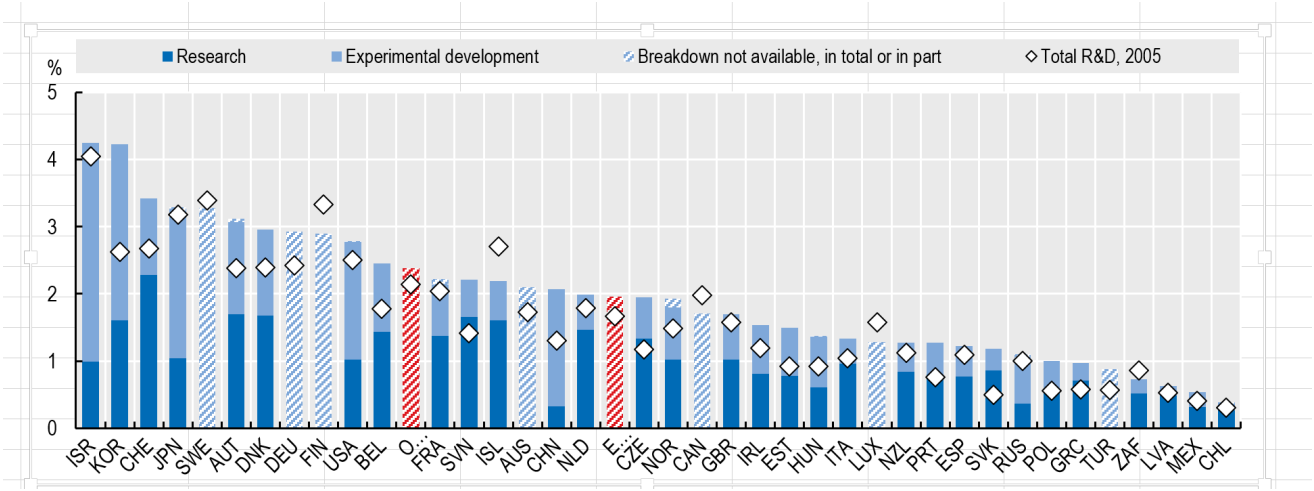


Source: OECD, Economic Outlook Database.
StatLink http://dx.doi.org/10.1787/888933672743

2. INTENSIVE RESEARCH AND DEVELOPMENT

Israel is ranked #1 in private R&D expenditure as percentage of GDP – about 4.3% (as of 2016), of which 84% comes from the private sector – the highest among OECD countries, reflecting the prospering private sector innovation ecosystem.

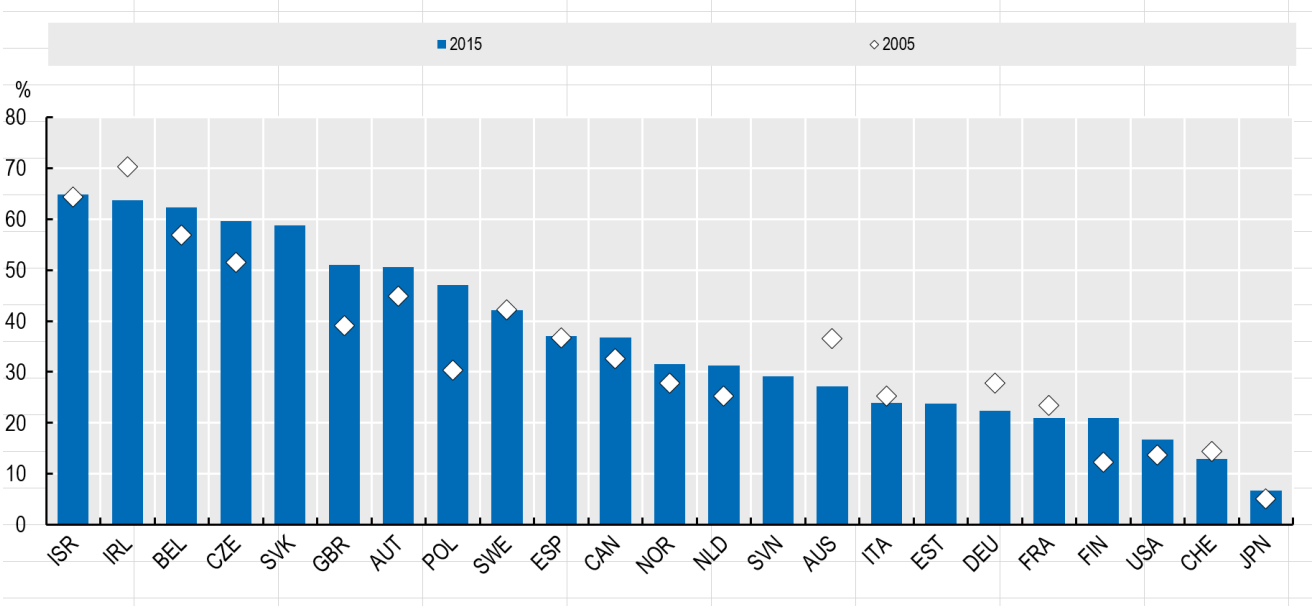
Expenditure on R&D as a percentage of GDP



Israel is also ranked #2 at the Innovation Index of the Global Financial Forum (Global Competitiveness Report, 2016-2017), that includes parameters such as scientific research institutions, business sector R&D expenditures, academy – industry cooperation, scientists and engineers pool and the number of patents in ratio to the size of the population.

Funds from abroad underpin a considerable part of business R&D; over 50% in Israel where 65% of business R&D is performed by foreign-controlled affiliates

Business R&D expenditures by foreign-controlled affiliates, selected countries, 2005 and 2015 or latest available year



Source: OECD

Involvement of multinational corporations

There are currently some 300 R&D centers in Israel, operated by leading international companies such as Apple, Google, Intel, Microsoft, HP, IBM and eBay. The extent of R&D by multinational companies in Israel is unprecedented.

These R&D centers account for about 50% of the business enterprise R&D expenditure.

Over the years, the multinational corporations who operate R&D centers in Israel acquired a total of 100 Israeli companies. A number of them, such as – Intel, Microsoft, Broadcom, Cisco, IBM and EMC acquired over ten local companies over the span of their operation in Israel.

In 2017, Israeli start-ups were sold for $23 billion in 112 deals.
Here are some of the biggest deals over the last few years:
*2018: electronic parts manufacturer **Orbotech** is bought up by KLA Tencor for $3.4 billion*
*2017: , **NeuroDerm** , a developer of pharmaceuticals for treating nervous system disorders was bought by Mitsubishi Tanabefor for $1.1 billion.*
*2016: social media gaming platform **Playtika** was bought by Giant Interactive in 2016 for $4.4 billion.*
*2013: **Waze**, the driving navigation app, was acquired by Google in 2013 for $1.3 billion*
*2012: $5 billion, video software unit **NDS** was acquired by Cisco in 2012. (Cisco is now said to be seeking a buyer for the unit.)*
*2006: **M-systems**, developer of the USB flash drive is acquire by SanDisk for $ 1.5 billion*

The presence of foreign companies in Israel has contributed greatly to economic growth and has a positive impact on employment, productivity, and knowledge flow, as skilled employees switch to local companies. Foreign companies also promote overall investment in R&D.

3. STRONG GOVERNMENT SUPPORT

The government of Israel is strongly focused on creating an R&D support network through various grants and incentive programs. The **Israel Innovation Authority** (formerly the Office of the Chief Scientist) is responsible for the country's innovation policy. It is an independent public entity whose role is to nurture and develop Israeli innovation ecosystem, while creating and strengthening the infrastructure and framework needed to support the entire knowledge industry.

To this end, it provides a variety of practical tools and funding platforms based on the specific stage and needs of the company, and grants range from 30% to 85% of the approved R&D expenses.

A research conducted by Prof. Shaul Lach of the Hebrew University in Jerusalem's (2008) examined the impact of government support on innovative R&D in the business enterprise sector. This research indicates that the direct result of governmental support in R&D is the creation of new research of up to two or three times higher value than the amount of the initial governmental grant, even in the industrial and software markets. This research further indicated that governmental support creates an added value to the industry which is five to ten times higher than the governmental investments, and that these investments do not push private investors away, rather create a significant and separate addition to the Israeli R&D.

<u>Grants for generic R&D</u>
(Subject to the R&D Law, non-royalty bearing)

The **Generic Program** - large companies with annual sales scopes in excess of US$ 100 million which employ more than 200 R&D professionals in Israel or with an R&D budget in Israel that exceeds US$ 20 million are eligible for grants for generic (pre-competitive) R&D expenses of up to 20% of their annual R&D budget.

The **Magnet Program** supports the formation of consortia of individual firms and academic institutions to jointly develop generic, pre-competitive technologies by offering grants of up to 66% of the approved R&D budget for companies and up to of 80% of the R&D budget in a research institution.

The **Magneton** and **Noffar** programs are designed to support applied academic research in all areas and especially in biotechnology and nano-technology in order to promote the transfer of the technology to the industry. Grants are up to 66% and 90% of the approved expenses respectively.

The **Nitzan Fund** - for encouragement of innovative technological collaboration between the research institutes and Israeli companies in the fields of Agriculture. The objective of Nitzan fund is to elaborate the applied research, in the different Agriculture fields, which haven't been acknowledge by the industry as having commercial potential.

Competitive R&D financial aid
(Subject to the R&D Law, royalty-bearing after commercialization)

The main OCS' program (the **R&D Fund**) supports R&D projects of Israeli companies by offering conditional grants ranging between 20 and 50% of the approved R&D expenditure. The duration of an approved development program is generally up to one year. If the project is commercially successful, the company will be under an obligation to repay the grant by royalty payments.

The **Traditional Industry Program** is designed for companies in the traditional industries such as plastic, rubber, metal, glass, ceramics, hardware, textile, wood, leather, paper, metalwork and food which are interested in upgrading their coping capacity in the local and global markets by conducting innovative R&D.

Tnufa Program is designed to encourage and support an individual entrepreneur in his initial efforts to build a prototype, register a patent, design a business plan, etc. Grants are up to 85% of the approved expenses for a maximum of $50,000 for each project.

Pre-seed Companies Program -
Pre-seed companies that have yet received any OCS support (other than in the technological incubator programs or the TNUFA Fund) and that have raised relatively small amounts of capital from private investors are eligible for support at a rate of 50% of the approved budget.

Technological Incubators -
The technological incubator program, created in 1991, offers a support framework for early-stage R&D by giving fledgling entrepreneurs an opportunity to develop their innovative technological ideas and set up new businesses in order to commercialize them. The incubator operators are selected through competition which evaluates, among others, the nature and experience of the operator's team, the quality of the business plan and the available financial resources.

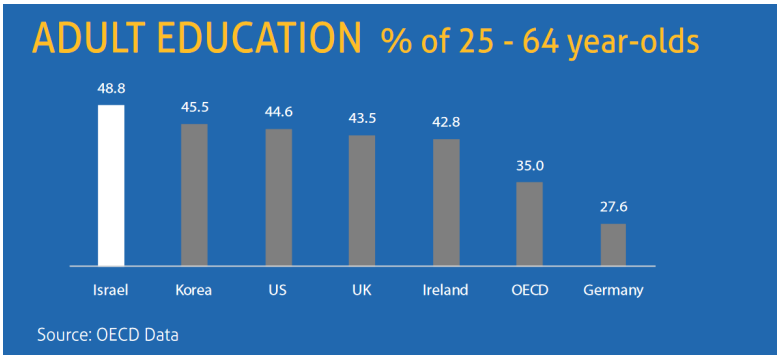
Kidma
Kidma is an aid program designed for cyber-security companies which offers preferred competitive terms that include a grant of up to 50% of the approved budget and participation in marketing expenses. Budget approval may be obtained for this program for a maximum period of 24 months.

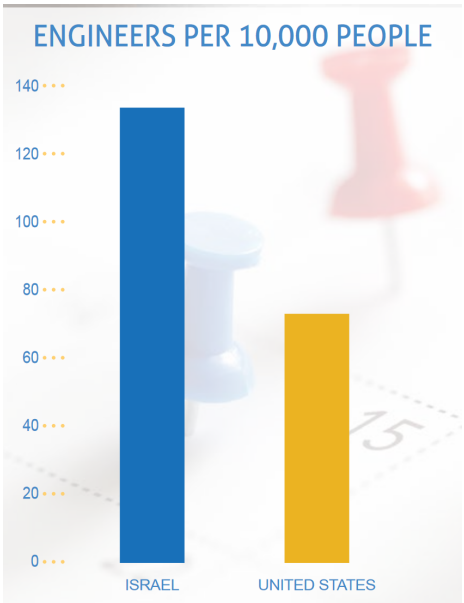
The Space Program - is designed to encourage R&D for finding various space related technological solutions such as business space R&D and development or upgrading of space related products.

4. ACADEMIC EXCELLENCE

Israel's academic institutions have contributed greatly to establishing and developing the local technology market. According to OECD data, Israel ranks second worldwide in percentage of the population with academic degrees: 49% of the population has an academic degree and approximately one-third of these graduates hold degrees in engineering and technological fields.

Israel is ranked third for the quality of its scientific research institutes and leads the category for percentage of researchers (number of R&D scholars in relation to the population). The flow of knowledge from the academic institutions, combined with the migration of excellent students and researchers from the academic institutions to the private-commercial sector, guarantee the success of the industry.
Israel counts 140 scientists and technicians per 10,000 employees, one of the highest ratios in the world. In comparison, there are 85 per 10,000 in the United States and 83 per 10,000 in Japan.





5. THRIVING ENTREPRENEURSHIP

Israel's thriving technological entrepreneurial activities draws investors and mega companies from all over the world who are at the forefront of global technology. Israeli entrepreneurs are known for their creativity, high skills, audacity, and multidisciplinary thinking.

Osnat Lautman, an Israeli consultant on cross cultures describes the general lines of Israeli business culture based on the word ISRAELI *(http://olm-consulting.com/five-things-make-israelis-entrepreneurs/)*

-**Informal**: casual dress in the workplace, egalitarian expression of opinions among employees at different levels in the organization, familiarity with foreign guests.

-**Straightforward**: direct style of speech, rapid shifts from one topic to another, easy simple and clear communication
-**Risk-Taking**+:
-**Ambitious**=
-**Entrepreneurial**: courage, sophistication, innovativeness, creativity, perseverance
-**Loud**: emotional temperament, noisy body language, high volume, and more emphasis on talking, less on listening.
-**Improvisational**: thinking outside the box, continually thinking, initiating and changing until the desired goal is reached

6. VALORIZATION OF R&D THROUGH STRONG TTOS

The role of commercialization companies (TTOs) is to seek out, develop, and market the knowhow accumulated in public institutions such as hospitals, colleges and universities, in order to turn patents into commercial products, as well as assisting in creating startup companies. Commercialization companies with these activities substantially contribute to the growth of the economy by increasing the income of the institutions they represent.

TTOs play a major role in the life sciences industry in Israel, as many patents, new start-ups and licensing agreements in the field originated from the eight research universities and eleven research institute and hospitals located across the country.
A 2017 survey by the Central Bureau of Statistics shows that TTOs filed 635 patent applications in 2016 and were also involved in setting up 34 startup companies, and 6,425 patent applications were filed in 2016.

7. DYNAMIC VENTURE CAPITAL MARKET

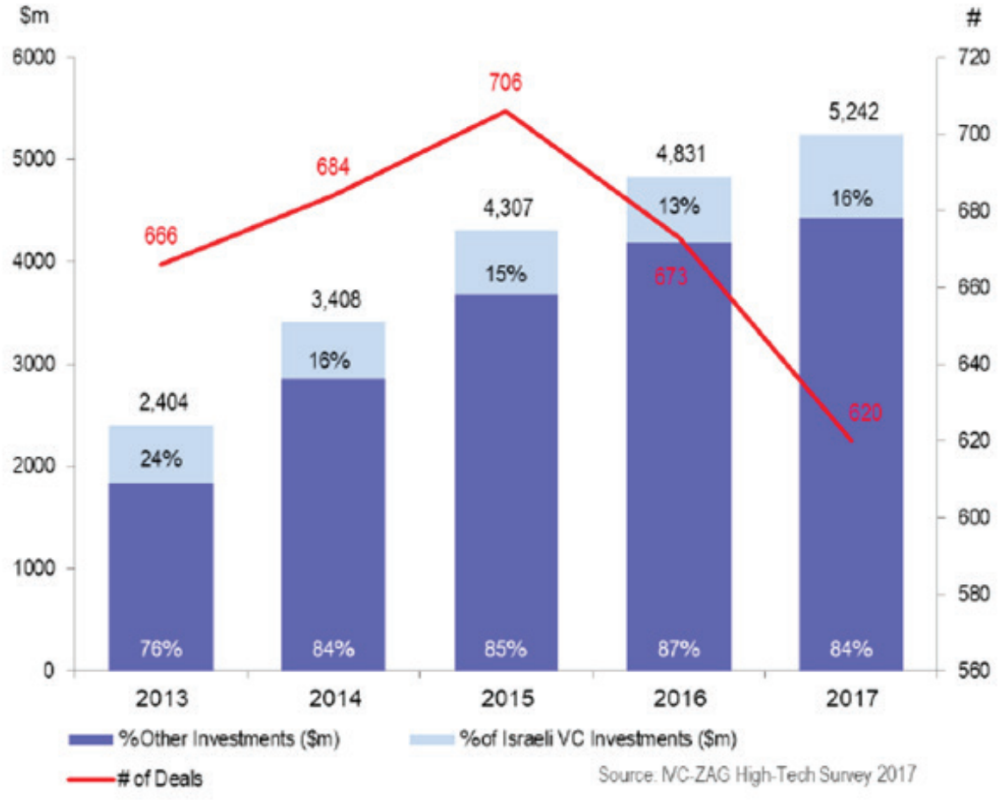
Israel is ranked #1 in Venture Capital investments as percentage of GDP. Some 5,000 Startup companies are active and a net of 600 more are launched on an annual basis. In 2006, Israeli high tech firms raised $4.8 billion from venture capitals and other investors. Israel is ranked #3 in the number of companies listed on NASDAQ, following superpowers such as the USA and China.

The Israeli high tech industry has several sources of funding: the Israel Innovation Authority, Israeli and foreign venture capital funds, micro-funds, foreign or Israeli investment companies, corporate investors, IPOs (mainly the NASDAQ and other foreign stock-exchanges) and angels.

Israeli high-tech companies raised an all-time annual high of $5.2 billion in 2017, spread over 620 deals, up 9% from $4.83 billion in 2016 (673 deals). The main reason for the increase was four large deals of over $100 million each (Cybereason, Via, Lemonade and Skybox), representing 12% of the total amount raised.
The amount of funds raised has been growing since 2013.
The decrease in the number of deals continues in 2017, including a decrease of 17% in the number of deals in seed stage companies. As a result, the average financing round has grown to $8.5 million in 2017 and is in constant increase since its 2013 level ($3.6 M).
Since 2015, companies in mid and late stages of growth have attracted the largest chunk: $3.9 billion in 2017 (vs. $3.4 in 2016). Mid-stage companies increased their share to $2.1 billion in 2017 compared ($1.8 in 2016). Seed and early stage companies raised $1.36 billion ($1.43 billion in 2016)

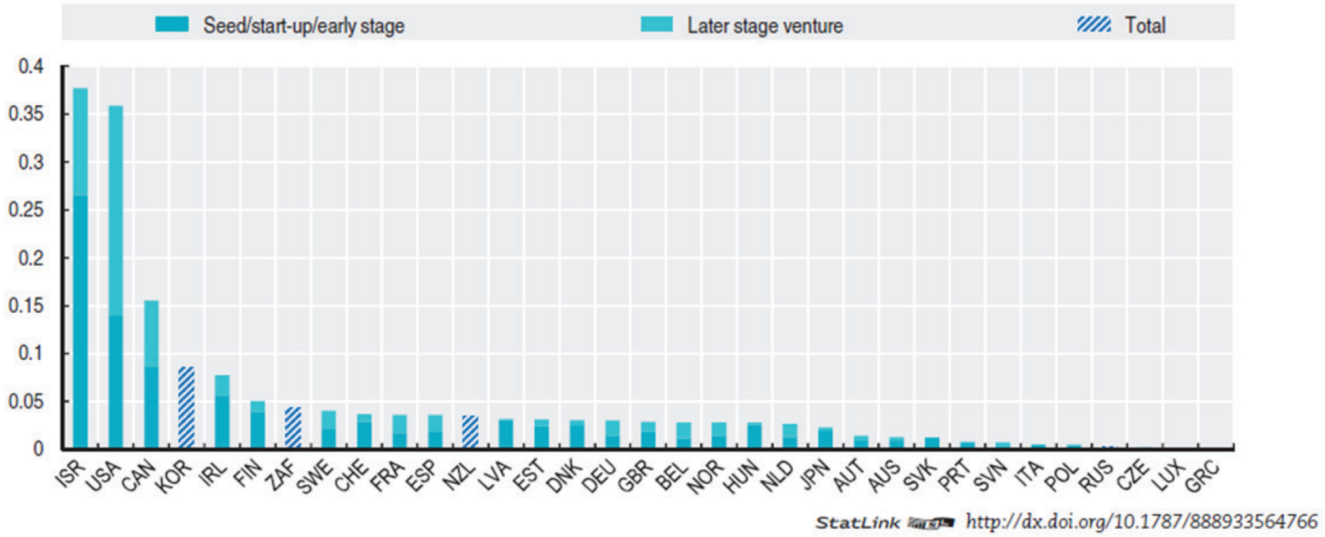
Israeli venture capital funds invested $814 million in 2017, the highest sum since 2013, and up 25% from $651 million in 2016.

Capital raised by Israeli High-Tech Companies



The Israeli market is unique in the level of expenditure of VC investments. While in the majority of OECD countries, venture capital represents a very small percentage of GDP (usually less than0.05%), Israel's level of expenditure by VC investments in 2017 was the highest among the OECD, with more than 0.35% of GDP.

Expenditure by VC as a % of GDP (2016, or latest available year)



Source: Entrepreneurship at a Glance 2017, OECD

8. INTEGRATION INTO THE EU RESEARCH AREA

In 1975, a Free Trade Agreement was signed between Israel and the countries of the European Union.

In 1995, an "Association Agreement" was signed, and entered into force in 2000.
The main features of the agreement include regular political dialogue, provisions on freedom of establishment and liberalization of services, the free movement of capital and competition rules, the strengthening of economic cooperation on the widest possible basis and cooperation on social matters, supplemented by cultural cooperation.
An Association Council is foreseen which will meet once a year at ministerial level. This is to be supported by an Association Committee has also been set up, with responsibility for implementing the Agreement. The Agreement reinforces the arrangements for trade in industrial products which have been in force since the late 1970s

Israel has been a full member of the EU's framework programs and later on the Horizon 2020 program. Israel is a member of Galileo, the Euro-Med Agreements and the GLP Agreement with the EU. Israel joined the OECD in 2010.

9. USEFUL LINKS

Startups and Venture Capital in Israel - Geek Time Annual Report 2017:
https://files.geektime.co.il/wp-content/uploads/reports/2017/geektime-annual-report-2017.pdf

No Camels Israel Innovation News**: http://nocamels.com/2018/06/tel-aviv-tech-hub-world/**

Israel Advanced Technology Industries: **http://www.iati.co.il/**

Start-Up Nation Central: **https://www.startupnationcentral.org/**

Israel Science and Technology Directory: **https://www.science.co.il/**