

Israel - Technology Hub of the Future

How Israel is revolutionizing
itself as a technological and
entrepreneurial powerhouse

THOUGHT LEADERSHIP

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Pioneering the Way Forward

When speaking about high-tech hubs, Israel rarely comes to mind when compared to countries like the United States, China, and the European Union. Nevertheless, that has changed as the country is steadily establishing itself as a country that is on the right path of conquering global technology and becoming an entrepreneurial powerhouse (Cohen, 2019).

In fact, Israel is listed by the Bloomberg Innovation Index at position #5 globally as a technology destination in research and development, patents, technology education as well as other accolades that signify technological superiority (Weinberg, 2019). Finland, Germany, and South Korea are in the fourth, third and first positions respectively with the United States occupying the sixth position (Weinberg, 2019). Additionally, in research and development, Israel is at position two and number four in the category of a country with a higher number of top researchers as well as post-secondary education (Weinberg, 2019). For quite some time, the country has maintained its top ranking position with regards to the number of corporations that are listed in the NASDAQ (Korbet, 2019).

Israel's ability to maintain steady growth in research and development compared to powerful nations like the United States and China is more astonishing when you remember that Israel is a country of only 8 million people (Korbet, 2019). Understanding the reasons behind Israel's success requires a focused view on its ability to leverage its commitment towards research and development.

II. Background Information of R&D Development in Israel

The information, communication, and technological advancement in Israel emanates from the country's desire to fulfill its geo-political needs. The research and development in Israel's Department of Defence made tremendous contributions to the beginning of the industrial sector and revolutionized education in higher learning institutions, especially in science and engineering, ICT industry workforce composition as well as the general research community (Korbet, 2019). There were also large capital allocations by the government towards development of equipment and capabilities solutions for the defence. Consequently, there was a massive accumulation of engineers and scientists with greater skills and experience that pushed the allocation of public resources to institutions of higher learning and research (Korbet, 2019). There was also improvement of the curriculum that these institutions taught to match the shifting market needs in the technology industry.

It is also prudent to note that not all R&D emanates from the department of defence. There are also numerous multilateral corporations that play significant roles in the advancement of the R&D in information technology in Israel (Rodman, 2019). The country is host to multinational companies such as IBM, Motorola, Intel, Apple, and Philips alongside a host of other companies. The Foreign Direct Investment that these corporations pump into the economy helps Israel prioritize its technological development needs. These corporations have also imported

their skilled manpower and technology that individually and collectively work towards enriching the technology talents of the local population (Rodman, 2019).

There are also massive incentives from the government that are further enhanced by the presence of more skilled and experienced human capital. This improved human capital has made the country one of the most sought after R&D destinations in the world (Rodman, 2019). Various reports from the Organization for Economic Co-operation and Development (OECD), for instance, indicate that the current proportion of the Israel's foreign multinational investment is approximately 50.7% in comparison with the gross expenditure on R&D of the country (Rodman, 2019). The same trend is reported by the Central Bureau of Statistics of Israel with an additional 45.3% investment from the Israeli business expenditure on R&D (Rodman, 2019).



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III. Factors Influencing R&D Development in Israel

Economic Ties Between the United States & Israel

A mutual relationship with the United States is one of the major driving forces for the advancement of the research and development in Israel. In fact, when one walks along the highway that connects Tel Aviv, it is easy to confuse it with Silicon Valley (Carrillo, 2019). Most of the locals refer to the place as “Silicon Wadi” since almost every building belongs to one of the United States’ major technology companies (Carrillo, 2019). Intel, to be specific, constitutes one of the largest employers of IT professionals in Israel, with numerous labour surveys reporting that over 10,000 Israeli engineers and scientists work there (Maggor, 2020). In fact, Intel has established its largest R&D centre in Israel, second only to the one in the United States. Apple has also established its first ever R&D centre in the Herzliya region and is said to have provided approximately 1,000 job opportunities for people living in Israel (Maggor, 2020).

There are also other major announcements of acquisition of Israel-based, information technology incubation centres by major technology companies that are not limited to Microsoft, Intel, Philips, Google, GE, Medtronic, Cisco, HP, Motorola, and Qualcomm (Maggor, 2020). This implies that most of the innovations will be undertaken in Israel before distributing to other countries of the world. Other innovations resulting from the friendship between Israel and US includes capsule endoscopy development that could assist in taking higher resolution images of the digestive system was developed by Medtronic (Maggor, 2020). To resolve the challenges of limited parking spaces in public areas, Unitronics developed robotic parking garages and successfully implemented them in the United States (Maggor, 2020).

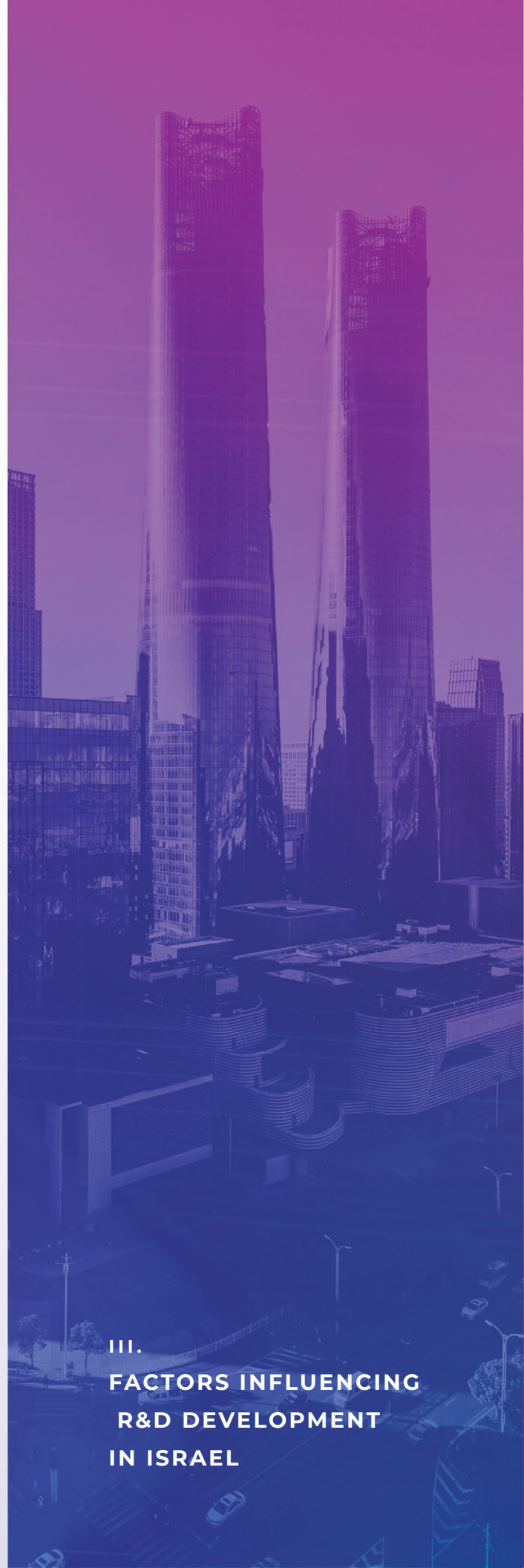
Moreover, most of the Israeli innovations involve upgrading United States Air Force fighter planes. The helmet-mounted system of display intended to for the new F-35 Joint Strike Fighter, for instance, was the innovation of Elbit (Baram & Ben-Israel, 2019). Additionally, a contract to construct the new light multi-purpose combat military vehicle intended to replace the renowned Humvee was awarded to Israel's Plasan, one of the major subcontractors of Oshkosh Corporation (Baram & Ben-Israel, 2019).

Only in Israel has famed US investor, Warren Buffett, pursued investments outside of the United States. Through his Berkshire Hathaway firm, Buffett purchased 20% of toolmaker Iscar's stock, injecting a total of \$2 billion into Israel's economy (Baram & Ben-Israel, 2019). A private investor showing such great trust in Israel clearly indicates its goodwill amongst investors and solidifies its place as a major technology hub in the world (Baram & Ben-Israel, 2019).

Additionally, as part of the market analysis, you will want to consider what that means for your products or services. Some markets will require businesses to adapt their existing products or services, change pricing, etc. to meet local preferences and spending potential. With something like food, it's safe to say mochi ice cream parfaits are going to be more desirable in Asian nations than in South American nations. You must be realistic about product changes that you will have to make, as well as the cost to make them. What is the comparison in total between changing your service and the potential earnings of selling in that new market? Sometimes, the cost to change what you are offering is higher than the payout, which should tell you right now to stop in your tracks.

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Sound Government Policies & Incentives

Since 1969, the Office of the Chief Scientist (OCS) in the Economy Ministry has been tasked with R&D development and building the high-tech industry that Israel currently enjoys (Baram & Ben-Israel, 2019). Outside of higher learning institutions, the OCS makes the most policies in the country and has various functions, like providing funds to aid innovations and research like the R&D fund, Consortia program, and the Technical Incubator Program (Baram & Ben-Israel, 2019). There are also other frameworks of operations, including the Directorate of the Israel-Europe R&D that's responsible for the Seventh Framework Program for R&D for Israel, Israeli Industry Centre for R&D, and the Horizon 2020 (Maggor, 2020).

The country has also relied on progressive liberalization in the general IT subsectors allowing for privatization through the sale of government stake in major public corporations. There was, for instance, sale of government stake in the Bezeq, the incumbent fixed wire line service provider of the country (Maggor, 2020). The country also adopted a regime that was favorable to a multi-operator environment and allowed for realignment of the competitive local exchange carrier license for improvement of the technological infrastructure, telephony and broadband services and transmission. In addition, two new infrastructure-based operators also entered the Israel technology market following the floating of a wireless tender in 2010, resulting in the broadening of the wholesale fixed communication Regulatory functions (Maggor, 2020).

The 1982 Communication Law gives the communications minister authority to create legislation that governs all the appropriate telecommunication services and equipment,

including type approvals and technical specifications (Maggor, 2020). This type of regulation has reduced the bureaucracy that normally accompanies technological market liberalization efforts and thus provides better opportunities for R&D development (Maggor, 2020).

In March 2008, a statement on intellectual property protection in Israel was submitted to the United States Trade Representative as a portion of the yearly Special 301 evaluation process (Maggor, 2020). The submission determined the Israeli government's intellectual property law was adequate, effective, and pursuant to the entire applicable intellectual property watch list recommended by the United States Trade Representative. The Israeli government wants the country's intellectual property law to ensure that intellectual property rights enforcement, acquisition, and maintenance is not only modern but also surpasses the uniform minimum standards as outlined in the various multilateral treaties that regulate most elements of the intellectual property standards (Maggor, 2020). Such a law is also promoted by the state as it gives monopolies time and scope constraints pursuant to inventions, copyright works, and inter alia (Maggor, 2020).

Stronger ICT Ecosystem for Israel's Entrepreneurship Spirit

Israel's national research and innovation system is dominated by the OCS in the Economy Ministry and is tasked with formulating and governing policy for the Committee of Planning and Budgeting of the Higher Education Council and industrial R&D (Baram & Ben-Israel, 2019). Engagement with the Ministry of Finance is a milestone achievement that has helped the country's R&D achieve more due to enhanced

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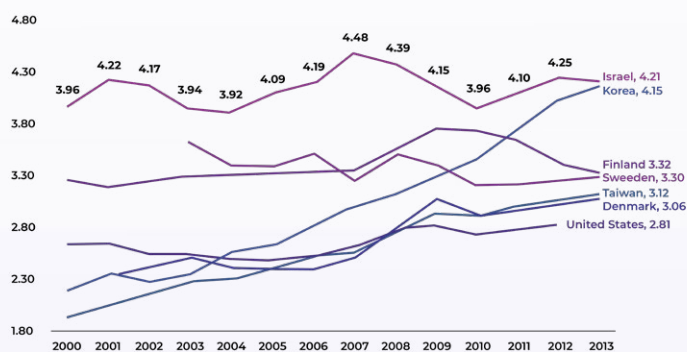
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Increased budgetary allocation to R&D

The Israeli government has also realized that the ICTs may constitute the economy's growth engine. As a result, incentive laws adoption, aiding VC funds creation and the establishment of the Office of the Chief scientist in the Economy Ministry has greatly supported the construction of the R&D ecosystem (OECD, 2015). Consequently, the country attained a higher score in Gross Domestic Expenditure on research and development as demonstrated in the figure below.



Work sourced: OECD, "Main Science and Technology Indicators" retrieved www.oecd-ilibrary.org/science-and-technology/data/oecd-science-technology-and-r-d-statistics/main-science-and-technology-indicators_data-00182-en

The spread of ICT has greatly impacted society, particularly amongst its socioeconomically deprived members. For instance, real-time information has guaranteed massive benefits to developing countries with regards to commodity prices, weather updates and most importantly, the easy transfer of money (Savrul & Incekara, 2015). Government effectiveness has also increased twofold due to the improved ability to advance effective and efficient citizen-centric digital services in addition to elevated citizen involvement in the day-to-day governance of the country. The increased budgetary allocation has also become a

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major motivator for business, creation of job opportunities as well as productivity growth. For the aforementioned reasons, increased investment in R&D is one of the most significant potential contributors for comprehensive growth and enhancing the country's economic competitiveness (Savrul & Incekara, 2015).

In the Global Competitiveness Index Report of 2014, Israel maintained its 27th position from the previous year regarding expenditure on R&D (Savrul & Incekara, 2015). Its major strength was its capacity to innovate, which can be attributed to the availability of numerous businesses that are supported by the presence of numerous research institutions that enjoy funding from public coffers (Savrul & Incekara, 2015). This IT development prowess is also partly linked to intense government support and sound public procurement policies characterized by a conducive financial environment that assists start-up businesses.

Network Readiness Index

- 2015 position: 27
- 2014 position: 27
- 2013 position: 26

Retrieved: Dutta, S., Geiger, T., & Lanvin, B. (2015). The global information technology report 2015. *In World Economic Forum.*

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Furthermore, most of the IT programs being implemented by Israel are projected towards 'sector neutrality,' implying that the winners were not picked by the government. The Technical Incubators program, for instance, is a clear demonstration of what sector neutrality means as the state continues to provide funding and support to various enterprises in the early pre-seed phase where the initial capital requirement is normally one of the major hindrances that is most likely to prohibit much growth or even investment by the private actors or venture capitalists (Dutta, Geiger & Lanvin, 2015). It is also important to note that the market-friendly approach of the Israeli government has allowed the evolution of specific policies and instruments over the years that have addressed some of the prevailing IT needs of not only Israel but the rest of the world. The consideration of the market at the time was also another factor that spurred development in R&D in Israel (Dutta, Geiger & Lanvin, 2015). Essentially, Israel is not endowed with many natural resources, so for the country to experience a stronger comparable advantage, it needed to shift its focus to more qualified human capital. Additionally, there was a constrained national market that could not sustain national industries amid prevailing political conditions that prohibited engagement in business transactions with neighboring countries. Availability of unfavorable structural indicators triggered the development of an industry that will not be dependent on the adverse political geography and the size of the market (Dutta, Geiger & Lanvin, 2015).

The 2015 ranking of the best 50 countries of the world in technological innovation by Bloomberg places Israel at the 5th position (Lorenzen & Mudambi, 2015). Bloomberg is a yearly ranking of nations that measures their research and development achievements to determine which country has better plans for its R&D needs. It relied on six areas in its rankings,

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including manufacturing, total number of high-tech companies available in every country, R&D, the student population joining institutions of higher learning, PhD professionals employed in R&D and most importantly, the number of patents per capita (Trajtenberg, 2002). The takeaway is that Israel is an emerging IT destination for persons interested in career and professional growth.

Education

Israel has continued to experience tremendous growth in student enrollment with approximately 30% of students receiving degrees across the country's 21 academic institutions (Engel & del-Palacio, 2011). The Central Bureau of Statistics also reported that 60% of young adults from Israel proceed to first degree studies, representing a 48% increase in the 2000 statistics (Engel & del-Palacio, 2011). Such an increase in student enrollment in higher learning institutions gave trained workers and managers a good opportunity to expand rapidly in the high-tech industry due to an assured supply of highly educated potential employees and innovators. There have also been efforts to reprioritize numerous professional streams in the higher education of Israel. In the beginning of the 1990s, leaders in the IT industry heavily retained graduates who were interns, turning them into full-time employees from leading universities in computer science and electronics (Engel & del-Palacio, 2011). There have also been efforts to mainstream career work streams to match the prevailing needs in the IT industry, especially in the high-tech sector due to the anticipated potential of growth and overall contribution to the country's gross domestic product (Engel & del-Palacio, 2009).

The Ministry of Education has also formulated the International Association for the Evaluation of Educational Advancement ventures which is

solely linked with exploring the best strategies instructors can use in teaching students literacy on computer and information technology (Engel & del-Palacio, 2009). Literacy is mostly concerned with an individual's ability to effectively utilize computers in undertaking research through creativity and advanced communication in households, schools, and the community at large.

Immigration

The development of Israel's state has been dominated by immigration, with populations of Jews from different countries traveling back to their home country and bringing with them numerous talents as well as technological capacities, creativity, and motivation. This movement has established growth potential for Israel in terms of research and development and was enhanced by the disintegration of the Soviet Union alongside the explosion of information communication technology at the end of the 1980s (Swan, 2015).

Secondly, between 1990-2009, there were a total of 1.25 million immigrants to Israel, 80% of whom came from the former Soviet Union (Swan, 2015). A majority of these immigrants were in possession of advanced degrees and training in technical courses. They brought with them aspirations, creative problem solving skills and, most importantly, formidable scholastic culture. The upsurge of immigrant population led to a rise Israel's population by a fifth which in turn re-energized the country's overall level of education. Various surveys report that these immigrants included over 100,000 engineers and scientists that helped pushed the population of engineers per capita globally i.e. 140 for every 10,000 employees (Swan, 2015). Such a proportion was double that of the United States and Japan, which are the second and third ranked countries in the world. The influx of scientists and engineers was so overwhelming that the



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country was unable to absorb it initially. In order to mitigate that fact, the state rolled out business development programs to enhance entrepreneurial skills to these skilled graduates. Through such incentives and bolstered by their higher technology education backgrounds, the immigrant populations opted to use the acquired entrepreneurial skills to engage in business start-ups rather than look for traditional employment (LOPEZ-CLAROS & Mía, 2006). Due to rapid IT industry expansion in Israel, the country quickly integrated the skilled immigrants into its R&D development plans which in turn attracted more skilled and highly trained Israeli engineers, a majority of which went to look for greener pasture in Europe as well as the United States (LOPEZ-CLAROS & Mía, 2006).

Provision of Work Permits

Working in a foreign country requires a person to have certain qualifications. Israeli laws require a foreigner to obtain a work permit known as the B-1 work visa as well as relevant visa of entry before entry into the country (LOPEZ-CLAROS & Mía, 2006). The Interior Ministry outlined the procedure that is required of a foreign expert possessing or in need of engaging in a profession that requires higher academic education such as research and development engineers, Auditors, and Senior Executives. Obtaining a work permit B-1 entails four simple steps:

1. Providing a comprehensive work permit application to the Interior Ministry with an elaborate description of the project, employment conditions, and need for expertise.
2. A B-1 work visa application to the local Ministry of Interior office will then be cabled for processing from the consulate of Israel to the applicant's country of origin.

3. Provision of an interim B-1 work permit by the consulate of Israel to the applicant's country of origin before making entry into Israel.
4. Issuance of B-1 work visa following entry of the applicant into Israel to cover the whole work permit period, a procedure that is accomplished at the border control station of Ben Gurion Airport or even in the line ministry after entering the country. This type of work permit is generally active for a one-year period from the date on which the application was approved. Nonetheless, an extension of the period can be requested by the employer for a further duration. Generally, a person can stay or work in Israel for a maximum period of 5 years and 3 months upon starting work in the country.

Additionally, the B-1 work permit only covers a single entry and it is thus up to the employer to organize for multiple entry permits.

Even though the above requirement for a work visa applies across the borders of any country, Israel has relatively flexible minimum requirements when compared to other countries like the United States that is characterized by intense bureaucratic procedures. The bottom line is that Israel is creating an environment that attracts persons as well as multinational corporations to broaden the R&D of the country.

Reforms in Capital Market & Investment Incentives

Israel has worked continuously to attract foreign as well as domestic investors into the country. The investment incentive package traces its beginning from the Law for the Encouragement of Capital Investment (LECI) of 1959 (LOPEZ-CLAROS & Mía, 2006). The major intent of such legislation is to encourage private investment in the regions of the country that have witnessed

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little or no economic growth. Even though the law was revised to consider prevailing economic developments in information technology, it nonetheless failed to explicitly favour high-tech sectors. Instead, the law motivated investment in high value-added and marketing capabilities in the markets in the local and international arenas (LOPEZ-CLAROS & Mía, 2006).

The significance of the legislation covered new as well as emerging projects with major variations regarding the specific geographical zone (LOPEZ-CLAROS & Mía, 2006). Other than the LECI's stated objective of enhancing private initiative as well as internationally competitive products, the soft market strategy approach by Israeli law is evidenced in its effort to woo private investors and share higher risks linked with venture expansion and development (LOPEZ-CLAROS & Mía, 2006).

Moreover, the law intentionally favored international investors through preferential tax treatment compared to domestic investors. The state believed that by providing a conducive tax environment along with the availability of skilled human resource engineers and scientists, they would definitely heighten the level of attractiveness of Israel as an Information Technology destination for foreigners interested in venturing in R&D (LOPEZ-CLAROS & Mía, 2006).

The rationale for the policy was that international corporations will not only create job opportunities for the locals, but will also encourage greater innovation and technological breakthrough, new procedures of operations, or even import channels that will work towards enhancing the general wellbeing of the nascent Israeli population. Put differently, the intention was to exploit the advantages that such multinational corporations will inject in the country in the expansion of the high-tech industry in Israel (LOPEZ-CLAROS & Mía, 2006).

International Corporations with R&D in Israel

The various government strategies created a favourable business environment and entrenched the goodwill that investors have in Israel, which is clearly evidenced by the increasing establishment of several high-tech giants including Intel, IBM, and Motorola. This has also led to reforms like deregulation, reduction of numerous restrictions and interventions, and above all, disengagement of capital market funds from financial institutions. The influx of major high-tech companies can also be attributed to the reserve requirements that amounted to above 30% at the end of 1980s. By the end of 1990s, it had dropped to 4% (LOPEZ-CLAROS & Mía, 2006). Consequently, interest rates greatly lowered, and a further reduction of the mortgage credit allocated by the state from 70% in the mid-1980s to less than 25% at the end of 1990s (LOPEZ-CLAROS & Mía, 2006).

A drastic drop in the obligatory share investment was also witnessed in government bonds by provident as well as pension funds. Provident funds were, for instance, given the opportunity to inject huge percentage of their holdings in the economy of Israel which they invested in equities alongside other financial assets. In line with such commitments, streamlining as well as stock market modernization through continuous trading and reduced periods of clearing worked effectively in a background of fairly viable regulation of securities. Policies are also in advanced stages of implementation that will widen the variety of financial instruments that the public can have access to so as to equalize tax treatment of various investor categories and motivate more long-term savings. Financial sector modernization, to be precise, is believed to have played a central role in ICT industry development.

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The foreign investors in Israel's technology industry also have two alternative approaches in establishing their dominance in the country; direct operations or using mergers or takeovers of various business start ups by the local populations and turning them into larger corporations or technology incubator centres (LOPEZ-CLAROS & Mía, 2006). The first establishment of an R&D by Microsoft other than in the United States is in Israel. The same is true for Cisco with the R&D of Motorola being its largest across the globe. The bottom line is that these foreign multilateral corporations want to leverage on the available skilled engineers in Israel as well as the country's track record for solving problems and innovation (Engel, 2015). It has been argued that the aforementioned competitive advantages have provided mixed blessings for the country's economy (Engel, 2015). The reason is that major research facilities make little contribution to job creation or manufacturing exports, instead functioning as a brain drain enterprise that deprives local corporations access to skilled IT personnel (Engel, 2015).

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*Summary of Companies That Have Been
Established R&D Centres in Israel*

R&D Center	R&D Center Sector (IVC Classification)	Number of R&D Centers in Israel	Est'd Year in Israel	Number of Employees in Israel	Key Innovations, Products & Technologies
<i>Apple</i>	Semi-conductors	3	2011	500	Development of hardware chips for iPhone & iPad
<i>General Motors</i>	Misc. Technologies	1	2011	60	Autonomous vehicles, human machine interface, connected vehicle
<i>Yahoo!</i>	Internet	2	2008	50	Time Traveler Application; smart advertising (market segmentation)
<i>Google</i>	Internet	2	2007	250	Google Auto-complete; Live Results; Google Related; Google Instant; Google Analytics
<i>SanDisk</i>	Semi-conductors	3	2006	700	Trusted flash technology; digital cameras (with Zoran); sold state drivers
<i>Samsung</i>	Semi-conductors; communications	2	1999	250	Galaxy Camera; eye-tracking system for Galaxy S4 smartphone
<i>HP</i>	Misc. Technologies	4	1994	5,700	Enterprise Swarm; automatic print quality inspection; semantic automation from screen capture; HP Indigo Photo Enhancement Server
<i>Qualcomm</i>	Semi-conductors; communications	3	1993	260	Wi-Fi technology, next generation of wireless local-area network connectivity; mobile enterprise security technologies; Qualcomm Snapdragon Mobile Development Platforms; digital pen and gestures based on ultrasound technology

Source: Lemarchand, G. A., Leck, E., & Tash, A. (2016). *Mapping Research and Innovation in the State of Israel* (Vol. 5). UNESCO Publishing.

**Summary of Companies That Have
Been Established R&D Centres in Israel
Continued**

R&D Center	R&D Center Sector (IVC Classification)	Number of R&D Centers in Israel	Est'd Year in Israel	Number of Employees in Israel	Key Innovations, Products & Technologies
<i>Microsoft</i>	IT & Enterprise Software	2	1989	800	Business intelligence in the Cloud & Office; XBOX Analytics; building a real-time recommendations platform for the Microsoft entertainment business
<i>Intel</i>	Semiconductors	5	1974	10,500	Premium M mini-processor Sandy Bridge & Ivy Bridge family of processors
<i>IBM</i>	IT & Enterprise Software; Semiconductors	3	1949	1,000+	ECO-2000 Optimized Crew Scheduling System; Web Sphere Content Discovery Server; mobile shopping app

Source: Lemarchand, G. A., Leck, E., & Tash, A. (2016). *Mapping Research and Innovation in the State of Israel* (Vol. 5). UNESCO Publishing.

On top of development of top-ranking R&D centres, there are also manufacturing facilities that multilateral companies such as Intel and Motorola have established and have grown to become some of the largest private companies and equal opportunity employers for the Israelis. Intel, for instance, absorbed approximately 6,000 employees in its various facilities and tech-hubs across the country in 2003 alone (Lemarchand, Leck & Tash, 2016). Towards the end of 2014, Intel had an approximate employee base of over 10,500 and exported goods worth US \$4.5 billion. The company has also become one of the leading exporters in Israel with 2003 reports indicating that Intel exported goods amounting to US \$1.6 billion which is equal to about 13% of every electronic export that Israeli takes to other international markets (Lemarchand,

Leck & Tash, 2016). Such a statistic exposes a relatively strong connection and level of trust between Israel and other companies since it is only in a favourable economic environment that investments by foreign multinational companies can translate into investments that run into billions of dollars every year (Lemarchand, Leck & Tash, 2016).

Technology Incubators

The Public Technological Incubator Program was initiated by OCS in 1991 following the increasing population of immigrants from the former USSR majority who were in possession of greater scientific and engineering skills. The idea was to jump start a market failure situation which was caused by higher initial capital requirement to start Information

Technology enterprises in an environment of inadequate human capital (Lemarchand, Leck & Tash, 2016). Put differently, the technology incubators constitute an organization with the sole mandate of offering entrepreneurs who lack adequate experience a chance to come up with their own innovative technology ideas with the aim of establishing their own businesses for profit (Branstetter, Glennon & Jensen, 2019). The ultimate objective of these incubators is to provide novice enterprises with the requisite support at the pre-seed stage. Every incubator is designed to handle between 10 to 15 projects at the same time while offering support in areas that establish the technological as well as the commercial viability of the generated idea, coming up with a detailed plan for R&D followed by R&D team organization, lobbying for funding and undertaking marketing preparation, and most importantly, providing secretarial and administrative service alongside accounting and legal advice to such start-ups (Branstetter, Glennon & Jensen, 2019).



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Small, But Mighty

Despite the fact that Israel is basically a country of approximately 8 million people, it is steadily positioning itself as one of the countries with a clear strategy on R&D. The government is committed in ensuring that economic ventures in R&D are properly funded. The country is unique in that it extends its financial aid to multinational corporations working in the country which not only gives the country the much-needed impetus for growth in R&D, but also works to market the country as a technology destination.

- Baram, G., & Ben-Israel, I. (2019). The academic reserve: Israel's fast track to high-tech success. *Israel Studies Review*, 34(2), 75-91.
- Branstetter, L. G., Glennon, B., & Jensen, J. B. (2019). The IT Revolution and the Globalization of R&D. *Innovation Policy and the Economy*, 19(1), 1-37.
- Carrillo, M. (2019). Measuring and ranking R&D performance at the country level. *Economics and Sociology*, 12(1), 100-114.
- Cohen, E. (2019). How globalisation impacted Israel and India differently in the 1990s. *Economic Affairs*, 39(1), 115-126.
- Dutta, S., Geiger, T., & Lanvin, B. (2015). The global information technology report 2015. In *World Economic Forum* (Vol. 1, No. 1, pp. P80-85).
- Engel, J. S. (2015). Global clusters of innovation: Lessons from Silicon Valley. *California Management Review*, 57(2), 36-65.
- Engel, J. S., & del-Palacio, I. (2009). Global networks of clusters of innovation: Accelerating the innovation process. *Business horizons*, 52(5), 493-503.
- Engel, J. S., & del-Palacio, I. (2011). Global clusters of innovation: the case of Israel and Silicon Valley. *California Management Review*, 53(2), 27-49.
- Korbet, R. (2019). Start-up Nation Central: Finder Insights Series–The State of the Israeli Ecosystem in 2018. Start-up Nation Central.
- Lemarchand, G. A., Leck, E., & Tash, A. (2016). Mapping research and innovation in the State of Israel (Vol. 5). UNESCO Publishing.
- LOPEZ-CLAROS, A. U. G. U. S. T. O., & Mía, I. (2006). Israel: Factors in the Emergence of an ICT Powerhouse.
- LOPEZ-CLAROS, A. U. G. U. S. T. O., & Mía, I. (2006). Israel: Factors in the Emergence of an ICT Powerhouse.
- Lorenzen, M., & Mudambi, R. (2015). Clusters and global innovation: The role of connectedness and connectivity. *The Handbook of Global Science, Technology, and Innovation*; Archibugi, D., Fillpetti, A., Eds, 212-227.
- Maggor, E. (2020). Politics of Innovation: The Entrepreneurial State and the Making of Israel's 'Start-Up Nation' (Doctoral dissertation, New York University).
- OECD (2015), "Main Science and Technology Indicators" retrieved www.oecd-ilibrary.org/science-and-technology/data/oecd-science-technology-and-r-d-statistics/main-science-and-technology-indicators_data-00182-en
- Rodman, D. (2019). Israel: Island of success.
- Savrul, M., & Incekara, A. (2015). The effect of R&D intensity on innovation performance: A country level evaluation. *Procedia-Social and Behavioral Sciences*, 210, 388-396.
- Shachmurove, Y. (2019). Determinants of economic growth in Israel. In *Economic Miracles in the European Economies* (pp. 99-121). Springer, Cham.
- Swan, A. (2015). New Evidence on Technology, Trade And Adjustment to Immigration in Israel. Development Policy Centre Discussion Paper, 38.
- Trajtenberg, M. (2002). Government support for commercial R&D: Lessons from the Israeli experience. *Innovation policy and the economy*, 2, 79-134.
- Weinberg, C. (2019, August). Entrepreneurial Ecosystems in Israel: The Changing Role of Government Support: A Historical Perspective. In 2019 Portland International Conference on Management of Engineering and Technology (PICMET) (pp. 1-3). IEEE.



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