

The Success of Israeli Tech in the COVID Pandemic

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*This paper was first published in Chinese in the "Israel Blue Book: Israel Development Report (2021)" on March 23, 2022.

Abstract: The outbreak of COVID-19 sent shockwaves across the globe, creating a host of new social, economic, and geopolitical challenges. Despite the profound challenges catalyzed by the spread of the virus, Israel's innovation technology ecosystem in the year 2020 managed to achieve a record-breaking year. The authors of this paper sought to identify and examine the factors that facilitated this marvelous achievement. They conclude that Israel's innovation ecosystem overcame the immense stress caused by the pandemic largely due to government support, pandemic opportunities, geopolitical competition, human capital, and the culture of chutzpah.

Introduction and Background

Before the onset of the novel coronavirus, Israel's economy had experienced stable growth, averaging around 3.5% per annum. Israel's GDP per capita had also risen at a steady pace. Moreover, The country boasted among the lowest unemployment rates in the world, sitting at around 5%.¹ Much of Israel's economic success has been attributed to the emergence of its flourishing innovation technology ecosystem. Back in 1979, high technology manufacturing accounted for a mere 14% of all Israel's industrial exports. In recent years, this figure has risen to more than 50%.² The Jewish State has emerged as having the second-highest R&D expenditure as a percent of GDP (4.3%) - double the average of members of the Organization for Economic Co-operation and Development (OECD) - representing the highest R&D intensity in the entire organization.³ Since its founding in 1948, Israel has become one of the leading countries in the global innovation race.

Bloomberg innovative index 2020 has ranked Israel as the 6th most innovative nation in the world, second in researcher concentration per capita, and seventh in patents per capita.⁴ According to The Annual Israel Tech Review published by the IVC research group in February

¹ <https://innovationisrael.org.il/en/contentpage/strategy-and-policy>

² <https://ec.europa.eu/assets/jrc/events/20140120-tto-circle/jrc-20140120-tto-circle-zetelny.pdf>

³ https://www.oecd.org/sdd/08_Science_and_technology.pdf

⁴ <https://www.bloomberg.com/news/articles/2020-01-18/germany-breaks-korea-s-six-year-streak-as-most-innovative-nation>

2020,⁵ between 2010 and 2019, an impressive 10,866 high-tech companies had been established across the country. With roughly one active startup per 1,400 people today, Israel has earned the moniker of “Startup Nation.” However, as COVID-19 swept across the globe, grinding air travel to a halt, upending global supply chains, and devastating economies worldwide, Israel was not left unaffected.

As governments worldwide scrambled to react to the coronavirus pandemic, Israel responded decisively. After declaring a state of emergency on March 19, 2020, the government gradually ramped up lockdown measures restricting citizens’ movements.⁶ Beginning March 25, Israelis were not allowed to travel further than 100 meters away from their homes for non-essential purposes, a measure that remained in force through early May.⁷ Partial lockdowns were also instituted on religious holidays - in Jewish towns and cities during Passover and the High Holidays and in Muslim ones during Ramadan. A further nationwide lockdown was instituted in December in response to the global surge in infections. The initial economic consequences were brutal.

The Israeli economy contracted by 7.1% in the first quarter of 2020, the steepest decline in 20 years.⁸ Over one million workers - constituting nearly 25% of the Israeli workforce - applied for unemployment benefits in March 2020 alone, as economic activity imploded and firms in the private sector placed huge numbers of workers on unpaid leave.⁹ However, Israel’s economy managed to bounce back, weathering the COVID-19 pandemic better than most nations. Compared to other OECD countries that, on average, contracted by 5.5% in 2020, Israel’s economy shrunk a mere 2.4%. While the strict lockdown measures and rapid vaccine rollout contributed to this trend, demand for Israeli technology emerged as a critical factor in Israel’s ability to overcome the crisis.¹⁰

As 40% of the world’s startups reported major disruptions due to the novel coronavirus, Israel’s innovation ecosystem not only adapted but came to thrive. According to PriceWaterhouseCoopers (PwC), Israeli acquisition deals and Initial Public Offerings (IPOs) recorded an impressive \$15.4 billion in 2020. This represents a 55% increase from 2019’s \$9.9

⁵ https://www.ivc-online.com/Portals/0/RC/Magazine%20&%20YB/IVC_ANNUAL_ISRAELI_TECH_REVIEW_FEB_2020/mobile/index.html

⁶ [Israeli coronavirus surveillance explained: Who’s tracking you and what happens with the data](#)

⁷ [Ministry of Health](#)

⁸ [Israel’s economy shrinks 7.1% in Q1 amid virus, sharpest decline in 20 years](#)

⁹ [Israeli unemployment exceeds one million: 24.4% of workforce](#)

¹⁰ <https://www.reuters.com/article/us-israel-economy-gdp-idUSKBN2AG14I>

billion. The largest recorded IPO for the year 2020 was that of JFrog, an Israeli company that developed the world's first universal artifact management platform at \$3.9 billion. The second largest was Lemonade, which specializes in insurance powered by artificial intelligence and behavioral economics, at an offering of \$1.6 billion. At least six other acquisitions were valued at over \$500 million. According to IVC data, venture capital saw 578 deals inked at a total investment of \$9.9 billion. The Tel Aviv Stock Exchange also fared well throughout 2020, recording a 43% rise in daily trading volume along with 27 IPOs - the highest since 2007. Market trading results reflected some declines, including TA-35 and Tel Aviv Real estate indices which dropped by 15.4% and 12.5%, respectively. Those that fared better were the TA Tech-Elite index, which grew 35%, and the TA-Technology index which rose 31%.¹¹ All considered Israel's innovation technology ecosystem fared pretty well under the profound strain caused by the novel coronavirus. Economic growth is expected to rebound in 2021, with the Bank of Israel projecting a 6.3% rise, conditional on maintaining the swift rollout of vaccines. Meanwhile, Goldman Sachs has estimated Israel's 2021 growth will reach 7.5%.

Following the Q1 slump, Israel's innovation ecosystem displayed a remarkable degree of resilience, agility, and flexibility in the face of significant adversity. After conducting a thorough literature review of primary and secondary source materials, the Authors of this paper have identified at least five factors that helped explain this phenomenon: Government intervention; pandemic opportunities; geopolitical competition; human capital; and culture.

1. Government Intervention

In response to the crisis, government agencies announced a slew of economic measures aimed at supporting struggling Israeli businesses. First was a 50 billion NIS package to aid small and medium businesses, defined as having an annual turnover of up to 100 million NIS. The package included government loans, the postponement of filing and payment deadlines for tax and corporate listings, as well as grants to support new businesses and cover fixed expenses such as rent and utilities.¹² These loans were provided to businesses under fantastic conditions: Up to 20 million NIS or 40% of the company's annual turnover with 85% government financing, no interest payments for a year, collateral limited to 5%, and bank turnover of up to 7 business

¹¹ <https://www.ipost.com/israel-news/2020-the-ups-and-downs-of-israels-economy-amid-covid-19-653750>

¹² [Auren](#), [KPMG](#)

days, to be repaid within 10 years with an additional grace period of two years.¹³ For large domestic businesses (defined as having an annual turnover greater than 200 million NIS, employing at least 100 workers in Israel, and registering at least 50% of their capital assets or intellectual property in Israel), the Finance Ministry established a 14-billion NIS fund for loans of up to 8% of annual turnover (or 8% of annual expenses for tech companies) and not more than 100 million NIS with 75% government financing and 5% collateral, to be repaid within 5 years with an additional year's grace period.¹⁴

The Israeli Finance Ministry also introduced a number of financial aid measures aimed at assisting individuals affected by the COVID-19 pandemic. The primary measure was several one-time and continuing stimulus payments to small businesses and self-employed individuals who experienced significant decreases in turnover as a result of the pandemic. Other steps included expanding unemployment benefits to older workers and those placed on unpaid leave, childcare grants, and an extension of unemployment benefits for all workers.¹⁵ The government also paid employers up to 7,500 NIS for each employee who returned to work in the months of May and June 2020.¹⁶

Where the Israeli government diverged from other countries' pandemic responses was in several programs specifically aimed at bolstering innovation. In early April 2020, the Israel Innovation Authority (IIA) established three grant programs for projects supporting the pandemic response. These included grants for both early-stage R&D and later-stage development and execution of projects addressing pandemic-specific challenges, as well as supporting R&D in products intended for government COVID-19 prevention, treatment, and management. The IIA also dedicated 600 million NIS to over a thousand expedited innovation grants focusing on projects with technological innovation and commercial potential and taking companies' financial capabilities into account. The rationale behind these measures was explained by the head of the IIA, Aharon Aharon: "The [Ministry of the] Treasury also understands that Israel's hi-tech industry is the key to emerging from the financial crisis in the day after the pandemic. The high-tech industry mostly relies on private capital. From past experience, this source of funding decreases significantly in times of crisis [...] The role of the government, using the IIA, is to increase funding

¹³ [קרבן סיוע ייעודית לעסקים בעקבות התפשטות משבר הקורונה](#)

¹⁴ [Ibid.](#)

¹⁵ [Israel - Measures in response to COVID-19 - KPMG Global](#)

¹⁶ [Knesset passes stimulus bill to pay businesses thousands to bring back workers](#)

of projects during this period, and enable good companies to weather the crisis.”¹⁷ Despite Aharon’s grim prediction, however, Israeli startups managed to raise more money than ever in 2020, though M&A transactions plunged by \$6.4 billion, or 45%, compared to 2019.¹⁸

These programs are part of a long-standing collaboration between Israel’s government and its tech sector. The referenced IIA was established in 1965 as the Office of the Chief Scientist in the Ministry of Economy and is tasked with supporting R&D at promising Israeli companies, including bi-national funding with foreign governments.¹⁹ Over the years, the IIA has steadily grown as the main government sponsor of R&D, and in 2020 had a budget of 1.9 billion NIS.²⁰ R&D is a huge sector in Israel, consuming 4.9% of Israeli GDP in 2019, the highest figure in the world and nearly twice as high as the OECD average.²¹ In addition to R&D, the Israeli government also turned Israel into a highly lucrative target of venture-capital investment. *Yozma* (“Initiative”), a government program launched in 1993, established favorable tax policies for foreign companies investing in Israel and promised to match foreign investment with government funding, catalyzing the explosive growth of venture-capital investment in Israeli start-ups. The government also established Israel’s first technology incubator in the 1990s, paving the way for the subsequent establishment of many others, and provides employment grants for foreign companies who establish R&D centers in the country.²²

2. Pandemic Opportunities

The COVID-19 pandemic brought hardship and tragedy to every corner of the globe. Alongside the painful human costs, unprecedented public-health measures signaled upheaval in every industry and sector of the global economy. Suddenly, millions of workers around the world were required to work from home, instantly boosting demand for remote work solutions in an exponential manner.

With this massive transition to a virtual work environment, the demand for cybersecurity products and services also increased exponentially, as hackers attempted to take advantage of newly exposed software weaknesses and other vulnerabilities. In March 2021, *Fortune* reported

¹⁷ [רשות החדשנות תזרים מיידי 650 מיליון ₪ להייטק - כמענה ראשוני להתמודדות עם המשבר](#)

¹⁸ [Israel's startup ecosystem powers ahead, amid a year of change](#)

¹⁹ [IIA - Strategy and Policy](#)

²⁰ [רשות החדשנות בעשור האחרון | תקציב רשות החדשנות בעשור האחרון | Israel Innovation Authority](#)

²¹ [OECD - Gross domestic spending on R&D](#)

²² [The Israeli technological Eco-system](#)

that the global cybersecurity market grew by 7.6% in 2020 and predicted that it would only continue to grow even faster in coming years.²³ This was no distant international phenomenon, either. According to a report by American cybersecurity firm F5 Networks, Israel was by far the most popular target for hackers, attracting approximately 180,000 cyber attacks in a 3-month period in mid-2020. Indeed, Israel and the United States alone were the targets of roughly as many attacks as the next seven countries combined.²⁴ Israel's own cybersecurity watchdog confirmed reports by civilians of over 9,000 such incidents in 2020, a 50% increase from 2019.²⁵

The pandemic was also concurrent with a number of important and unrelated developments in the cybersecurity world. In December 2020, Reuters uncovered that foreign hackers, suspected to be Russian, were behind a significant breach at IT firm SolarWinds.²⁶ The firm's clients included the U.S. Treasury Department and Department of Homeland Security, triggering U.S. sanctions against Russian intelligence officials and increasing awareness of cybersecurity measures employed by institutions around the world. The increased scrutiny of the social network app TikTok, owned by Chinese firm ByteDance, by the U.S. government throughout 2020-2021 has also contributed to increased awareness of the importance of cybersecurity for both firms and individuals.²⁷ All these events further served to boost demand in the cybersecurity industry.

This massive boom for the cybersecurity industry was a windfall for the Israeli economy, as Israel is a world leader in cybersecurity. Unlike other players in the field, the Israeli cybersecurity sector relies heavily on a group of shadowy offensive and defensive cyber units in the country's military providing extensive professional training to many of its young citizens before entering the labor market. Thus, many Israelis join the workforce in their early and mid-twenties with significant training and real-world experience in the field of cybersecurity, as firms are eager to recruit veterans of elite IDF cyber units who often go on to start their own successful companies. This unique phenomenon, a product of Israel's lengthy universal military conscription, has become a well-established pipeline over the years and has garnered significant media attention around the world.²⁸ Indeed, a human resources director at cybersecurity firm Guardicore is quoted in an

²³ [Cyber Security Market Size, Share, Growth | Trends \[2021-2028\]](#)

²⁴ [Recent Cyberattacks: 2020 Application Protection Report, Vol. 3](#)

²⁵ [INCD - סיכום שנה 2020](#), p. 25

²⁶ [Suspected Russian hackers spied on U.S. Treasury emails - sources](#)

²⁷ [Do you really need to worry about your security on TikTok? Here's what we know.](#)

²⁸ [Inside Israel's Secret Startup Machine](#)

Israeli newspaper as saying that “the IDF does the vetting process for us for potential hires,” a sentiment echoing the hiring practices of many firms in the field.²⁹

The data show that Israeli firms were well positioned to capitalize on the increased demand for cybersecurity solutions. According to data from the Israeli National Cyber Directorate, Israeli cybersecurity firms raised \$2.9 billion in 2020, an increase of 70% compared to 2019, exported \$6.85 billion worth of products and services, and were part of over 20 mergers and acquisitions, totalling approximately \$4.7 billion.³⁰ 2020 also set a seven-year record for venture-capital investments in Israel, with 620 first investments by Israeli and international funds.³¹ This success has continued into 2021, with Israeli firms raising \$1.5 billion and producing more unicorns than all of 2020 in the first quarter alone.³² As of April 2021, Israeli firms accounted for 33% of the world’s cybersecurity unicorns and attracted 31% of global investment in cybersecurity, second only to the United States.³³ The most significant increases were unsurprisingly in fields related to the global transition to remote work: investment in application security increased by 140% in 2014, while cloud security investment rose by an incredible 200%. Not only did total funding of Israeli cybersecurity companies increase, but so did the number of companies funded - 64, an increase of 5% from 2019 - and the average seed size, which hit an all-time high of \$5.2 million.³⁴

The virtual work environment of the COVID-19 pandemic aided the Israeli tech industry in an additional way. Israel is geographically relatively isolated both from the world’s other major technology centers and from global financial centers in the United States, Western Europe, and East Asia. With investors and entrepreneurs working from home across the globe, however, their relative physical locations suddenly became much less critical. For an overseas venture-capital firm, therefore, meeting with the executives of an Israeli start-up required the same amount of effort as meeting with a domestic firm, thereby negating a former comparative advantage of domestic firms in larger markets. These gains will likely remain in place in the medium and long term as firms adjust to doing business virtually, but some firms are already seeking to establish physical presences in Israel for the post-pandemic era. Most notably, this includes Blackstone,

²⁹ [מ-8200 לחברות הסייבר: כך מגויסים אלפי חיילים למשרות נחשקות](#)

³⁰ [INCD - סיכום שנה 2020](#), p. 46

³¹ [|VC 2020 Most Active Funds Report](#)

³² [As cyber wars escalate, Israeli tech gains an edge | Ctech - CTech](#)

³³ [Cybersecurity attacks surge during pandemic as Israel startup industry thrives](#)

³⁴ [2020 was a record year for Israel's security startup ecosystem](#)

the world's largest investment firm, which announced in April 2020 that it would open an office in Tel Aviv.³⁵

3. Geopolitical Competition

Israel has also benefited from external circumstances entirely unrelated to the coronavirus pandemic, most notably by taking advantage of strategic competition between the world's largest economies. The most obvious arena in which this has taken place is the global semiconductor industry, where Israel has attempted to walk a fine line between East and West.

In 2015, the Chinese central government published "Made in China 2025", a multi-trillion-dollar strategic plan for reducing China's dependence on foreign producers and dramatically increasing its foothold in advanced manufacturing industries. A key element of this plan has been the production of semiconductors, crucial to the development of next-generation digital technologies, for which the plan has outlined a highly ambitious goal of producing 70% of domestic demand by 2025.³⁶ In the interim, Chinese manufacturers must import roughly \$300 billion of chips a year, the largest amount spent on any single product, despite a government plan to invest roughly 1 trillion RMB in domestic production.³⁷

Troubled by the potential economic and security implications of China realizing this goal, the United States and its allies have set limitations on access to high-end chips for the Chinese semiconductor industry. This has forced Chinese semiconductor manufacturers to diversify their supply chains and search for ways around American sanctions. A Rhodium Group report on Chinese investment in the U.S. has stated this as "an unprecedented buying spree of assets along the semiconductor supply chain in Asia, Europe and North America" by both private and government actors.³⁸ Perhaps surprisingly, one major target of this buying spree has been Israel, a close U.S. ally. In 2019, Reuters reported that Israeli exports of semiconductors to China had increased by 80% from the previous year, with the majority of the total volume originating from American chip giant Intel's Israel plants.³⁹ This tremendous growth helped China overtake the United Kingdom as Israel's second-largest trading partner in 2018, though it remains far behind

³⁵ [Blackstone Hires Israeli Tech Executive Yifat Oron; Announces Opening of New Office in Tel Aviv](#)

³⁶ [Semiconductor Dependency | US-China Institute](#)

³⁷ [China Revs Up Grand Chip Ambitions to Counter U.S. Blacklistings](#)

³⁸ [Chinese Investment in the United States; Recent Trends and the Policy Agenda](#) (p. 77)

³⁹ [Exclusive: Israel's chip sales to China jump as Intel expands](#)

the United States, which trades with Israel at an almost fourfold volume.⁴⁰ Gu Wenjun, chief analyst at ICWise, a China-based semiconductor consulting firm, put it clearly: “Because of the trade war, China and Israel’s cooperation is closer than it has been before.” He indicated that Israel-China semiconductor trade had not yet reached its saturation point, adding: “Israel has the technology and China has the market – the space for cooperation is big.”⁴¹

Since China’s major challenge in its pursuit of semiconductor independence is expertise, Chinese firms have sought to obtain manufacturing technology from Israeli firms. In 2016, Chinese tech titan Huawei purchased Toga Networks, an Israeli company involved in semiconductor R&D.⁴² This was followed by the 2019 purchase of Israeli chip technology producer ADT, which manufactures specialized equipment required to produce the very small microchips China seeks to produce independently, by the Chinese fund Neng Yang.⁴³ Chinese conglomerates and funds such as Xiaomi, Baidu, Ping An, Fosun International, Shenjing 360, and the Yongjin Group have all made significant investments in Israeli tech companies or venture capital funds involved in semiconductor R&D and production in recent years.⁴⁴ As of 2018, China still trailed the U.S. by a factor of twelve in terms of high-tech capital investment in Israel. Notably, companies in Israel are not required to report all foreign investments, this means that Chinese investment in Israel could be greater than the figures suggest.

American officials have grown wary of the ties China is establishing with their close military ally in the Middle East. They have repeatedly voiced their concerns about the involvement of Chinese conglomerates in several high-profile infrastructure projects in Israel, such as the construction of the Tel Aviv light rail system and a desalination plant near sensitive defense installations. A contract awarded to China’s SIPG for the expansion and future operation of the Haifa port, in proximity to facilities where the U.S. Sixth Fleet docks when in Israel, has been made a contentious issue by US officials. In this context, it is important to note that Haifa is not an operational facility for the U.S. Navy, which already operates large operational bases in close proximity to Chinese-controlled ports both in Italy and even in Seattle.⁴⁵ Despite this, the deal

⁴⁰ [Israel Trade - WITS](#)

⁴¹ [Exclusive: Israel's chip sales to China jump as Intel expands](#)

⁴² [Huawei reportedly acquires Israeli IT networking company Toga Networks for \\$150 million](#)

⁴³ [Chinese Fund Neng Yang Acquires Israeli Dicing Equipment Company ADT | Ctech](#)

⁴⁴ [Chinese Investment in Israeli Technology and Infrastructure: Security Implications for Israel and the United States](#)

⁴⁵ [The Haifa port-China conundrum in context | Dale Aluf | The Blogs](#)

prompted a visit from Former Secretary of State Mike Pompeo at the height of the pandemic in May 2020, who went as far as to indicate that leaving Israeli infrastructure vulnerable to Chinese interference could hamper intelligence and security facility sharing between the countries.^{46,47} The U.S. Coast Guard also offered to conduct a security review of the deal, an offer which Israel politely declined. Despite this pressure, however, the Israeli government did not back out from the contract, and has worked to allay American concerns over it.⁴⁸ With this precedent, China's efforts to fulfill its semiconductor requirements through Israel might well come to attract heightened American scrutiny and pressure in the future. Like other countries with warm relations with both major powers, Israel could find it increasingly difficult to maintain its delicate balancing act between its two major export destinations who find themselves on opposite sides of a technology trade war. Nevertheless, Jerusalem seeks to continue expanding economic cooperation with Beijing to the highest possible extent.

4. Human Capital

Israel's tech industry has been able to take advantage of the country's demographics, an area in which the country's comparative advantage shone through particularly well during the pandemic. The first relevant demographic in this context is higher education. Israeli high school students consistently rank towards the bottom of the developed world on the international PISA exams and have even been trending downwards in some disciplines, but the country boasts excellent higher education statistics.^{49,50} Despite lengthy military conscription and large sectors of society who reject secular life, Israel has the third-highest proportion of college graduates in the world, behind only Japan and Canada, as well as the highest numbers of scientists and engineers per capita.^{51,52} This was established by a large influx of well-educated immigrants from the former Soviet Union in the 1990s, but continues through maintaining highly affordable tuition at public universities and a traditional Jewish commitment to pursuing education.

⁴⁶ [Pompeo presses Israel to distance from China; US-China-Israel Relations: Pompeo's Visit – The Diplomat](#)

⁴⁷ [Pompeo: China Is Threat to Intelligence Sharing Between US and Israel](#)

⁴⁸ [רוצים ללמוד פרטים על הפרויקט הענקי בנמל חיפה? חפשו בסין](#)

⁴⁹ [Major drop for Israeli students on international test, exposing growing gaps within society](#)

⁵⁰ [PISA 2018: Insights and Interpretations](#), pp. 6-11.

⁵¹ [Israel ranks as world's third most educated country](#)

⁵² [The Israeli technological Eco-system](#)

In comparison to other developed economies, Israel also boasts a fantastically bottom-heavy age pyramid. 28.4% of the country's population is under the age of 15, the highest proportion of any developed country and 60% higher than the OECD average (2018).⁵³ This is sustained by a high fertility rate of 3.1 children per woman, again higher than any other developed country and almost twice as high as the OECD average (2018).⁵⁴ Admittedly, this age breakdown has been sustained by very high fertility rates in the country's Arab and ultra-Orthodox Jewish (*Haredi*) communities, who are tremendously underrepresented in the tech sector.⁵⁵ Arabs form a mere 4% of the Israeli tech workforce, well under their 21% share of society, and earn between 25-50% less than Jews on average (depending on demographic).^{56,57} Arab women form a paltry 0.1% of the tech workforce, which explains why as of 2017, only one in 140 employed Arab women was employed in the tech sector.^{58,59} Haredim do somewhat better, making up 3% of the tech workforce and 12% of the population, but earning average salaries less than half as high as non-Haredi workers.^{60,61} Part of this is due to these groups' exemptions from the draft in Israel, limiting their access to the natural pipeline feeding veterans of IDF intelligence units to tech companies, and part is due to myriad cultural and social factors restricting their exposure to technology and secular and higher education.

Either way, some progress is being made, driven by Israeli firms' insatiable appetites for labor. The Israeli government has launched a national initiative to train more Haredi tech workers, and the data are encouraging.⁶² The number of Haredi graduates of tech-related degree programs grew 11-fold from 2008-2018,⁶³ and programs have been started to train young Haredi man and women for employment at tech companies.⁶⁴ Data collected by Israel Advanced Technology Industries (IATI), a tech nonprofit, show that the number of Haredi tech workers increased by 52%

⁵³ [Demography \(OECD\) - Young population](#)

⁵⁴ [Demography \(OECD\) - Fertility rates](#)

⁵⁵ [Israel's high-tech industry has a diversity problem. Here's why](#)

⁵⁶ [דו"ח חדש: ערבים מהווים רק 4% מכוח העבודה המקצועי בהייטק](#)

⁵⁷ [מגמות בשילוב החברה הערבית בישראל בתחום ההייטק](#), p. 11-12

⁵⁸ [דו"ח חדש: ערבים מהווים רק 4% מכוח העבודה המקצועי בהייטק](#)

⁵⁹ [מגמות בשילוב החברה הערבית בישראל בתחום ההייטק](#), p. 11

⁶⁰ [2020 שנתון החברה החרדית בישראל](#)

⁶¹ [IATI Haredi Hi-Tech Report 2020](#)

⁶² [המיזם הלאומי לשילוב חרדים בהייטק](#)

⁶³ IATI

⁶⁴ [ממוצע השכר של חרדי בהייטק נמוך ביותר מחצי; השכר הממוצע בענף](#)

in the years 2014-2018, with the number of women growing by an impressive 90% during this period.⁶⁵ Arabs have also been integrating into the tech sector in much larger numbers and their salaries have risen.⁶⁶ The government, in cooperation with Arab civil society organizations, has also approved a plan to increase the number of Arab tech workers from 8,000 to 20,000 in five years through secondary and higher education programs and opening new high-tech parks in Arab towns and cities.⁶⁷ To be sure, this trend has much more to do with an urgent need for tech workers than with equity concerns. The tech industry employs nearly 10% of the Israeli labor force, and labor shortages are becoming a serious issue, with the latest report from the IIA estimating that there were 13,000 open positions in December 2020.⁶⁸ Assaf Rappaport, co-founder and CEO of Wiz, a cybersecurity firm currently valued at \$1.7 billion, told an Israeli newspaper that every startup would like to hire more workers than are available and “Israeli tech’s glass ceiling isn’t money, but manpower.”⁶⁹

In such a labor market, it is no surprise that an external shock like the coronavirus pandemic did not have a particularly adverse impact on the Israeli tech sector. While firms in other industries had to reduce the number of their employees to cut costs in the face of reduced demand, many Israeli startups facing the same issue were likely already understaffed and thus could avoid terminating workers. Israel’s young population also contributed to minimizing the overall economic effects of the pandemic. As of writing this, the death rate in Israel from COVID-19 is 71 per 100,000 citizens, lower than most Western countries with older populations (apart from Scandinavia).⁷⁰

5. Culture

Combined with its human capital, Israel’s famous “start-up” culture has been a critical component of its ability to innovate and remain on the cutting edge of technological advances. A highly fraught security situation, geographic isolation, a dearth of natural resources, a highly educated society, and a large global diaspora all contributed to a culture of innovation, creativity, and pragmatism. This culture is at the foundation of Israel’s remarkable growth over the past 30

⁶⁵ IATI

⁶⁶ [מגמות בשילוב החברה הערבית בישראל בתחום ההייטק](#), p. 13

⁶⁷ [מהתמחויות ועד "בוסתנים": התוכנית להגדלת מספר הערבים בהייטק](#)

⁶⁸ [2020 HIGH-TECH HUMAN CAPITAL REPORT](#)

⁶⁹ [Israel's tech industry suffers from a chronic employee shortage, report warns | Ctech](#)

⁷⁰ [Mortality Analyses - Johns Hopkins Coronavirus Resource Center](#)

years, with GDP per capita (PPP) growing at an average rate of nearly 3.5% per year, nearly three times the OECD average.^{71,72} According to American researcher George Gilder, a full 70% of Israel's growth in the 1990s can be attributed to the tech sector, the highest share in the world.⁷³

Much has been written about the *chutzpah* culture of “Silicon Wadi” which makes Israel's entrepreneurs bold, impatient, and prone to taking significant risks in a calculated manner. Much of this can be attributed to Israel's security reality as a country which has had to fight for its very existence and legitimacy since before its establishment. This has resulted in both the conscription described above, with all its material gains for the technological sector, as well as a national mentality of facing challenges head-on, managing risk, and moving past failure quickly. During a global crisis, this attitude pays dividends. In a 2020 interview with *Forbes*, Jon Medved, CEO of OurCrowd, a major Israeli venture investment platform, described this attitude: “We have a longstanding tradition of turning curses into blessings. We don't have huge natural resources, so we have worked hard to develop our skills-base in the country. [...] There is a certain mentality that leans towards risk acceptance here [...] and people develop that from a young age.”⁷⁴

This “start-up” culture can also be seen in the traditional tendency of Israeli entrepreneurs to rapidly grow their start-ups and then sell them to larger companies at the first lucrative opportunity. Israel has the third-largest number of companies listed on NASDAQ, yet it has only ever produced two Forbes Global 2000 tech-related companies - Teva Pharmaceuticals and Check Point Software (which is also on the NASDAQ-100) - and never a Fortune Global 500 company in any sector.^{75,76} In recent years, however, these tendencies have started to shift rather significantly, with the numbers of both tech unicorns and tech companies completing large fundraising rounds of over \$50 million and \$100 million rising steadily year after year.⁷⁷

During the pandemic in particular, Israeli tech companies shifted their focus away from early-stage “exits” and towards maturation and IPOs. This is no minor shift, either: between 2010-2019, Israeli tech IPOs totaled \$10 billion, while for 2020-2021, that figure has already reached \$60 billion.⁷⁸ The data also show that Israeli companies were well-poised to capitalize on the behavior

⁷¹ [GDP per capita, PPP \(current international \\$\) - Israel | Data](#)

⁷² [GDP per capita \(constant 2010 US\\$\) - OECD members](#)

⁷³ [Silicon Israel: How market capitalism saved the Jewish state](#)

⁷⁴ [How Israel Became A Technology Startup Nation](#)

⁷⁵ [How Israel Became The Startup Nation Having The 3rd Most Companies On The Nasdaq](#)

⁷⁶ [The Global 2000 2021](#)

⁷⁷ [Israel transforms into scale-up nation - Globes](#)

⁷⁸ [Covid-19 led to the Israeli tech sector's rapid maturation | Ctech](#)

of markets during the pandemic. While the value of Israeli tech companies traded in the U.S. dropped from \$65 billion in late 2020 to \$51 billion in the early stages of the pandemic, by February 2021 it had shot up to an all-time high of \$226 billion, including the aforementioned newly-issued companies.⁷⁹ By entering the American stock market, Israeli entrepreneurs also took advantage of the uniquely opportune conditions for dynamic tech companies present at that time. The combination of all-time low interest rates and trillions of dollars of economic stimulus provided by the U.S. government tremendously increased the amount of money private investors were placing in the market, and fast-growing tech companies in pandemic-concurrent fields (as outlined in Section 2) were a particularly lucrative investment target. The local Tel Aviv Stock Exchange (TASE) also became an attractive option for tech start-ups, with 27 IPOs - the highest figure in 13 years - and strong annual performance in tech indices for 2020.⁸⁰ This contributed to TA Tech-Elite, the primary TASE technology index, outperforming the American NASDAQ in the first half of 2020, despite relatively low exposure to domestic investment.⁸¹

Conclusion

Despite the profoundly complex social, economic, and geopolitical pressures catalyzed by the novel coronavirus in the 2020 year, Israel's innovation technology ecosystem not only rose to meet the challenge but ended up having a record-breaking year. While the broader economy still contracted, the tech sector helped absorb the shock. The country's tech sector outperformed 2020's panic-stricken expectations by almost all metrics, maintaining its upward funding trend for the 7th year in a row. Institutions across the Israeli government, including the Finance Ministry and Innovation Authority, implemented a slew of economic measures and programs to keep Israeli businesses afloat, spark innovation, and minimize disruptions in capital flows. As the world transitioned to online work, the pandemic created unparalleled demand for digital services and cybersecurity solutions. As a global leader in all things digital, especially in the cyber domain, Israel was well-positioned to capitalize on these pandemic opportunities. At the same time, the massive shortages in advanced tech such as semiconductors sparked by heightened geopolitical tensions and supply chain disruptions also played to Israel's tech sector's advantage. None of this

⁷⁹ Ibid.

⁸⁰ [2020: The ups and downs of Israel's economy amid COVID-19](#)

⁸¹ [TASE - Is the Grass Really Always Greener on the Other Side?](#)



would have been possible if Israel lacked the human capital to keep up with the increased demand. Add to the equation that the people of Israel are born of a culture that has a knack for overcoming adversity, an inclination to take risks, it is perhaps not surprising that the Startup Nation sought opportunity in these troubling times.