The Impact of Technology on National Security: Examining Israel's Military Innovation Culture

Yaron Katz
Holon Institute of Technology, Israel

We live in a competitive global world led by countries that gain strategic advantages in innovation. Israel is a remarkable example for the ability to produce military innovation with limited resources. Its defense budget is less than one-thirtieth of that of the United States, although the "start-up nation" is leading the world in military innovations such as the Iron Dome missile defense system and the Trophy active defense system for armored vehicles. The research examines Israel's military innovation culture, which is based on a commitment to military technological superiority. It is argued that the enormous influence of high-technology start-ups on Israel's economy and its global competitiveness are related to security issues, as human resources are encouraged by government policy and the mandatory service in the army. The "security culture" which identifies the Israeli society can be explained in the role of Israel Defense Forces as the "people's army". The impact of technology is since the concept of national security, which the country is identified with since its establishment, has been under siege with the growing impact of digital military activity. The research found that the success of Israel's military innovation culture is with no proportion to its relative size, given the demands of national security and the cooperation between all parties – government, army and society – allowing it to maintain military superiority through the development of new technology.

Key words: Innovation, Military, Culture, Technology, Defense

Introduction

A rapidly changing world and competitive global environment have triggered intensive interest in the innovation, particularly in the defense sector. The research examines the relations between military and innovation, using the Israeli experience. The main issue that is at the core of the research is an analysis of how Israel, as a small country, transitioned its economy from a labor-intensive economy to become a nation with the second largest start-up ecosystem and perhaps the most innovative army in the world. As argued here, innovation is the main engine of Israeli economy, which is based on technology supremacy. The country revolutionized the global economy through innovation and start-up leadership, which became critical to competitive strategy. Although it is not surprising that Israel has become a leader in military innovation, given the demands of national security, it is notable that the characteristics of Israel's military and security production have transformed Israeli economy and revolutionized its military.

In the digital era, everything is rapidly and constantly changing, and military activities are based primarily of new innovations. The Israeli army (Israel Defense Forces – the IDF), is leading the world in innovations that protect civilian population and improve the military capabilities of its operations. The technological development of new era presents a new challenge to the IDF, similarly to all other militaries, with growing reliance on digital activity, and innovation enables Israel to strengthen its defense needs and ensure that the IDF's maintains its qualitative military edge. The research examines the success of the Israeli military in leading the world in innovation and empowering a new and modern military strategy, based on technology supremacy. It explores the connection between society and military and the links between military and technology.

Security Culture

To understand the importance of military supremacy and innovation, we need to understand first role of the army in Israel's society. The small country faces security challenges from its establishment in 1948, and requires of its citizens extended military service and service in the reserves. The Israel Defense Forces have characteristics of a "people's army," with conscripts and reservists strongly outnumbering long-time service professionals (Bick, 2010). The 'security culture' that characterizes the Israeli society was formed since the security subject is perceived the central issue of the national conscience and has central ramifications in all areas of life. Israel can be referred to as a society in which not only the army

but the public in general is ready for enlistment for the sake of what the government defines as a national interest. According to Melman (1993), Israel is considered to be "an enlisted society" where the entire public, and not only army personnel, is always ready to be drafted for a goal defined by the government as having national interest. The security issue takes a central place in the national consciousness, and the goal of the leadership is to create national consent and faith in the government and the state. Israel can be described as a "drafted society", where national insecurity leads to public loyalty in the army and its duties and military activities. During times of security tensions or military activities, the public turn into a "drafted model" consensus, which is based on the national interests, supporting the government and the army, emphasizing social solidarity and amplifying the dangers of terrorism or combat activities (form example: Sucharov, 2005; Peri, 2006: Maoz, 2007; Katz, 2012).

The unique "security culture" which identifies the Israeli society can be explained in the IDF's role as the "people's army" (Malchi, 2018). Israel's national security environment is extraordinarily volatile and characterized by an extremely high degree of uncertainty (Freilich, 2006). Falke (2016) suggests that the security culture is linked to the search for identity and cohesion. The aspects that are aimed at protecting national identity include according to Tarasiuk (2021) the image of the Jewish state and its security policy. As a result, the Israeli society has traditionally seen national security as more important that the need of the public to be exposed to sensitive information. It is commonly agreed that although Israel is a democratic state where freedom of speech and freedom of the press are cornerstones of its existence, in all that relates to security things should be different. The common view is that security needs are above the need of the media to publish and the need of the public to know, since Israel's security issues stand at the heart of its very existence and the common interests of the army are considered as an issue of national security.

One of the main dilemmas that Israeli society is dealing with is the role of the army in defensive and peace-oriented events. The intensity of the conflict in the Middle East are mounted by external forces and the nature of military conflicts that Israel is involved in modern times. The conflict is impacted by the involvement of political and global forces and gains a widespread and constant coverage by the international media, especially in times of military conflicts or peace initiatives. Markus (2018) explains that the uncertainty is related to increased risk of lower tolerance for large-scale military operations and the effect on the role of the army in society, the IDF's fighting spirit, and willingness to utilize reservist units. The uncertainty of the public has mounted since it is clear today that the actual combat is against terror organizations acting against the civilian population and not against an organized army of another country, as used to be in the past. The impact of technology is since the concept of national security, which Israel is identified with since its establishment, has been under siege with the growing impact of digital military activity. Berman (2012) argues that the IDF innovated effectively after military and civilian leaders similarly understood the importance of military innovation against threats of military conflict. Thus, the innovation superiority of the IDF is not only providing excellence in the fight against terrorism but also reassuring the Israeli public that the security culture that has it so long been identifies with, would continue to safeguard in the age of digital military defense.

Global Innovation Leadership

Innovation provides similar opportunities to all countries (Neibel, 2018), but countries that lead the world in generating advanced technologies and leveraging the full productive capacity of their economies can gain a strategic competitive advantage (Schwab, 2018). Innovation should be a catalyst for progress in any society and any country that seek to advance their competitive position through investments in technology, because the promotion of innovation needs to include increasing spending on research and development and investing in education (European Central Bank, 2019). Innovation is a major driver of productivity, economic growth and provides key development to boost productivity through investments in technology (Brand, 2017). Technology and globalization changed the way that the world operates in all fields - business, government, economic and social - in a way that creates global competition between countries for innovation. Advancements in information technology and the coming of competition between countries for innovation and new technology became crucial for global business strategy (Lawlor, 2007). Technology and innovation are fundamental to economic success and the struggle for markets in an increasingly competitive world. Digital technologies gained prominence as critical forces that determine economic growth, and these changes create new possibilities and raise new problems for consumers, businesses, and government agencies. In a modern economy, innovation is the key for financial growth, alongside with technology is openness to the world and deregulation of financial markets. In a global world, where global economy transpires - in contrast to economies that

were based on their own closed market - competition between countries is based on innovation. The result of the change in global economics is that countries that fall behind their rivals in technological development and secure economy become more vulnerable to exploitation (Chaudhry, 2006)**.** Global competition demonstrates that government support in targeting companies effectively improves their innovation performance, and strong government intervention leads to the concentration of resources in innovation (Wang, 2017).

Israel has become a global technological and entrepreneurial powerhouse. The Bloomberg Innovation Index, an annual ranking of countries that measures performance in research and development, technology education, patents and other marks of technological prowess, listed Israel at #5 in the world, after South Korea, Germany and Finland. In all that relates to innovation, Israel is an entrepreneurial powerhouse for technologies and the world's leading multinational companies have all choose to develop research and development centers in the country. They include companies like Microsoft, Motorola, Google, Apple, Facebook, Berkshire-Hathaway, Intel, HP, Siemens, GE, IBM, Philips, Lucent, AOL, Cisco, Applied Materials, IBM, J&J, EMC, and Toshiba. Also, many multinational corporates such as Tata, Kodak, Citi bank, and many others have established innovation centers in Israel (Minnen and Kirsch, 2016; Rosenberg, 2018; Katz, 2018; Ziskind and Brake, 2019).

The main reasons for the leadership in innovation are that Israel has managed to stay on top of technology in a variety of sectors and allows international players companies the opportunities and assistance to search for new innovation. Israel is ranked high in research and development expenditure per capita, investing about 4.8% of its GDP, whereas the average among the OECD is about 2% (OECD, 2018). Israel has a high quality educational system and is among the most educated societies in the world, with high percentage of engineers and scientists and one of the highest ratios of university degrees and academic publications per capita. Israel is world renowned as being the "start-up nation" and is the world leader for number of start-ups per capita, with small and medium-sized startup and high-tech companies and hosts large technology companies and multinational corporations with research and development centers (for example: Senor and Singer, 2009; Tabansky, 2016; Eldar and Fagerberg, 2017, Katz, 2019). The leading global status of Israel in innovation is supported by the government, since the Innovation Authority provides a variety of support programs and the Investment Law enables foreign companies to receive investment grants and pay a reduced corporate tax rate. Another incentive program offered by the government provides employment grants for research and development centers and large enterprises. The program offers a 4-year grant scheme covering on average 25% of the employer's cost of salaries for each new employee (Eldar and Fagerberg, 2017a; Israel Innovation Authority, 2022). According to Fischer (2018), the findings indicate that the main reasons for the successes of innovation projects have been the commitment of government policies and programs; the technological developments by elite military units; a military and business culture that embraces risk and entrepreneurship; the role of its universities in applied research and development; and the Russian Jewish immigration that brought a wealth of human capital.

Military Innovation Culture

The influence of high-technology start-ups on Israel's gross of national product is enormous, with no proportion to its relative size in the local or international context. Tabansky (2016) suggests that Israel demonstrated cyber power when applying various means towards achieving ends beyond enhanced cyber security. As Malach-Pines and Shade (2004) explain, the phenomenon of Israeli high-technology entrepreneurs raised great curiosity worldwide, as the unique relations between the Israeli-armed forces and the local hi-tech industry have been identified as a strong explanatory variable for the Israeli hi-tech boom. Shachmurove (2018) explains that Israel transitioned from a labor-intensive economy to become a nation with the second largest startup ecosystem in the world. According to the OECD (2018a), Israeli military intelligence unit drives country's hi-tech boom. Israel`s security needs have promoted the role of the IDF and the compulsory service requirement allows the intelligence unit to choose the best people to serve in technology based and cyber intelligence units. The IDF is leading the world in security development and expertise and serving in these units allows to develop leadership skills that can afterwards be applied to startup.

Perhaps the most important aspect of Israel's leading role in global innovation is related to the IDF. Due to the mandatory military service, young people receive advanced technical training during their military service and acquire a high sense of responsibility and success orientation. Military service is mandated by law but is also regarded as a privilege. Garyn-Tal (2019) found that combat experience, even including life-threatening situations, makes Israelis more willing to take risks in general, and

physical risks in particular, after their discharge from the army. As explained by Swed and Butler (2013), military service brings with it professional training, social ties, and social codes that influence the composition of the hi-tech workforce and hi-tech industry's organizational and functional culture. Examination of Israeli hi-tech workers' profiles reveals a very high proportion of military capital amongst the employees and an institutional preference for those who possess it. As such, the Israeli reality is that military service does not simply reproduce ethnic and class inequalities but rather, by molding the soldiers' conceptions of citizenship, is still a powerful mechanism of legitimizing a hegemonic militarized and class-differentiated social order (Levy and Sasson-Levy, 2008). The Israeli Army's intelligence divisions are known throughout the world for incubating some of the Start-up Nation's most successful high-tech ventures. Adamsky (2010) explains that the culture of military innovation offers a systematic, thorough and unique analytical approach that may well be applicable in other perplexing strategic situations.

The strength of Israeli economy is related to security issues, as human resources are encouraged by government policy and the mandatory services in the army. On top of the military service, Israel has experienced several immigration waves of academics from all over the world, with the result that Israel's creative, skilled, and ambitious workforce is one of the most obvious reasons leading executives turn to Israel to do business. In fact, Israel has an unusually large number of high-technology entrepreneurs and companies and it boasts one of the most highly educated, entrepreneurial and multi-cultural workforces, producing technologies, innovations, and research products adopted around the globe and across different sectors. Rothke (2018) explains that the success is related to military innovation culture that the job needs to be done: don`t worry about how the job is done, just get the job done. He explains that this approach trickles out into Israel's high-tech sector, where problem solving and fast innovation drive products to market. This anti-bureaucratic approach fuels innovation, as an IDF soldier serving and advancing in an IT unit controls a budget and operational responsibility equivalent to that of a mid-career IT executive twice his age employed by a US firm. As Google CEO Eric Schmidt explains: "Israel is booming in terms of entrepreneurship because you have a culture that allows you to challenge authority and question everything."

Innovation of the IDF

Over the years, the IDF has built a significant array of groundbreaking technology and many Israeli innovations are present in upgrades to U.S. Air Force fighters and Army equipment. Although Israel has become a leader in military innovation given the demands of national security (Sanders, 2000), Tariq (2020) argues that Israeli military and security would not have been attainable without the extraordinary official assistance and private investment from the United States. According to Swed and Batler (2013), the unique relations between the Israeli-armed forces and the local hi-tech industry, supported by aid for military innovation from the United States, have been identified as a strong explanatory variable for the Israeli hi-tech boom. As a result, the Israeli army developed technologies that protect the civilian population and improve the performance of IDF soldiers – thus continuously re-affirming its status as one of the best fighting forces in the world.

The most famous is the "Iron Dome" Air Defense System. The objective of the "Iron Dome" is to protect Israeli civilians from the constant threat of rockets launched at Israel from the Gaza Strip. It operates since 2011, after being developed by the Israel Aviation Authority and sponsored by American military aid to Israel. Each rocket is about $250,000, but its advantages are unaccountable for. With the Iron Dome, Israeli civilians have been protected from rockets in the last decade, including thousands of rockets that were launched during military operations carried by the army against terrorists in the Gaza Strip. As soon as a rocket is launched by the enemy, the radar station detects and tracks its course, and then immediately launches a missile to intercept and neutralize the enemy rocket before it causes damage to civilians or property.

A system used by air forces around the world is the F-16I "Sufa". The 'I' was added by Israel to F16 airplanes to adapt them the specific needs of the Israeli Air Force. To make the work of a pilot as easy and effective as possible, the F-16I has been equipped with a state-of-the-art weapons system, a specially constructed radar system, and a unique helmet system that allows the pilot to launch weapons at an enemy plane using only sight. Another system used by the Israeli Air Force is the drone, which is also called "the eyes of the IDF", since it allows to see without being seen. It has a wingspan of 85 feet, similar to that of the Boeing 737 aircraft. And is capable of carrying out long-range missions and has a 36-hour life in the air without interruption. The drone can withstand all weather conditions, since it is equipped with an automatic defrosting system and a take-off and landing system which can be integrated with many sensors. It operates on land and sea and doing a great job to control the enemy's

activities. Another important aerial system is the "Skylark I-LE", which is an unmanned aerial vehicle. It is small and almost undetectable. It is also light enough to be transported by one person and can be configured to fly in less than 8 minutes. The "Skylark" can handle 3 hours of unmanned flight with a live video day and night and in any weather condition.

Another unique Israeli development is the "Trophy" System, which aims to protect tanks. Because anti-tank missiles are able to damage tanks beyond repair, the "Trophy" System was built to counteract this threat. The detection system creates a 360-degree protective shield around the tank. When an enemy launches a missile against a tank equipped with a "Trophy," the system instantly detects and neutralizes the threat by firing a missile of its own to explode the enemy missile. Another Israeli made system to improve protection against tank damages is the "Merkava IV". This system includes an improved fire control system with the ability to defend against helicopter attack, a digital battlefield management system, and an unprecedented suspension and tracking system that enables movement even on the roughest of terrains that would force any other tank to its knees. It's not surprising that it's considered one of the best tanks in the world. Another system is the "Namer" (also called Leopard), which is a heavily fighting vehicle that has an advanced system that protects tanks and soldiers inside. It is considered the most heavily armored vehicle in the world of any type.

Other innovations improve ground military activity and protect soldiers. The "Tzefa Shirion" is a system that consists of a 394-foot-long chain propelled by a missile. When it falls to the ground, it explodes mines and allows clearing of roads up to 394 feet in length and 19-26 feet wide, consequently eliminating mines and creating open paths to advance through terrain. Another system, the "EyeBall", is a small black ball that transmits a 360-degree image to allow soldiers to stay outside of a room before they enter it without knowing what is waiting for them inside. With the EyeBall, they can see and hear everything that's happening inside and have all the information necessary to safely enter the building to arrest the terrorist. The "Spike" is a rocket launcher that was developed specifically for the needs of the IDF. The newest edition features a 40% reduction of weight from its previous design. It mounts to the shoulder and is the first of its kind with unique characteristics better equipped for ground operations. The "Spike" can be transported quickly and easily and can reach structures accurately from hundreds of feet away.

Conclusion

In examining the impact of technology on our lives, there is no doubt that the information age led to a revolution in the way that global communications interact between countries. Technology plays a large role in globalization on a cultural, political and economic level. It has become a fundamental vehicle for the development of every country, in areas such as the economy, politics, military and education. We live in a world of technology, which is improving at such a rapid rate, that we barely have time to learn the old technology before new technology comes out. This changes the way that people interact today and leads to debate of how our culture can adapt to such change and what affect it will have on society in the future. In the industrial age, the role of governments in technological development and economic growth has become crucial to the success of innovation policy.

In the information age policies must change to meet global competition and governments must formulate national innovation strategies. The global environment is dominated by a combination of technology, innovation and competition, with tremendous impact on the countries that have capitalized globalization and can benefit from investments global economy. The role of governments in advancing technology has become crucial for the global and economic development of countries since technological advances which cause the integration of the economies into a single market have become the determinant of the process of globalization.

The paper provides background on the role of innovation to the success of the Israeli economy and the importance of military innovation in a global economy. It describes the reasons and implications of the success of Israel's high-tech industry and the contribution of military innovation to the technological superiority of the country and its competitive position in the global economy. An important conclusion is that the core of success of military innovation is the result of cooperation between the government and the military, along with the adoption of an advanced military strategy of transforming the army to digital operation. This development emphasizes the unique situation of Israel, since the strategy of Israel Defense Forces is defensive while its operations and tactics are offensive and cut to the heart of national identity. The distinction between defensive values and offensive operations can provide the

means to understand the unique role of the IDF in Israeli heritage and society and the importance of cooperation between all parties – government, army and society – to maintain Israel's military superiority through the development of military innovation.

References

Adamsky, Dina (2010). The Culture of Military Innovation. The Impact of Cultural Factors on the Revolution in Military Affairs in Russia, the US, and Israel. Stanford University Press

Berman, Lazar (2012). Capturing Contemporary Innovation: Studying IDF Innovation against Hamas and Hizballah. Journal of Strategic Studies. Volume 35, 2012 - Issue 1

Bick, E. (2010). The Tal Law: A Missed Opportunity for "Bridging Social Capital" in Israel. Journal of Church and State, Volume 52, Issue 2

Brand, Gilad, State of the Nation 2017: A Macroeconomic Picture of the Economy in 2017, Taub Center, December 21, 2017. http://taubcenter.org.il/state-of-the-nation-report-2017-pr/

Chaudhry, Azam, and Garner, Phillip, Political Competition between Countries and Economic Growth, Review of Development Economics, Volume 10, Issue 4, November 2006. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-9361.2006.00341.x

Eldar, J., and Fagerberg, J. (2017). Innovation policy: what, why, and how. Oxford Review of Economic Policy, Volume 33, Number 1, pp. 2–23. https://people.uta.fi/~atmaso/verkkokirjasto/Edler_innopoli.pdf

Eldar, J., and Fagerberg, J. (2017a). Israel, where the public venture-capital fund Yozma has provided early-stage funding to some of the country's most dynamic companies. Oxford Review of Economic Policy, Volume 33, Issue 1, 1 January 2017, Pages 2–23 https://doi.org/10.1093/oxrep/grx001

European Central Bank (2019). How does innovation lead to growth? https://www.ecb.europa.eu/explainers/tell-me-more/html/growth.en.html

Falke, Simon (2012). Peace on the Fence? Israel's Security Culture and the Separation Fence to the West Bank. Journal of Borderlands Studies. Volume 27, 2012

Fischer, A. (2018). Inside the Israeli Innovation System: its origins, development and evolution (Unpublished doctoral thesis). University of Calgary, Calgary, AB.

Garyn-Tal, S. (2019). The impact of prior combat military service on Israeli women's self-efficacy and risk attitudes. Women's Studies International Forum. Volume 74, May–June

Israel Innovation Authority (2022). https://innovationisrael.org.il/en/contentpage/innovation-israel

Katz. Yaron (2012). "Examining the IDF Media Campaign on the Unilateral Disengagement Plan of Israel from Gaza Strip", GMJ: Mediterranean Edition. Volume 7, issue 1

Katz. Yaron (2018). Technology and Innovation in Israel: Advancing Competitive Position in a Global Environment. Open Journal of Political Science. Volume 8, issue 4

Katz, Yaron (2019). Technology, Society and the Digital Gap. Advances in Applied Sociology. Volume 9, issue 1

Lawlor, B. (2007). The Age of Globalization: Impact of Information Technology on Global Business Strategies. Senior Honors Projects https://digitalcommons.bryant.edu/cgi/viewcontent.cgi?article=1000&context=honors_cis

Levy, Gal; and Sasson-Levy, Orna (2008). Militarized Socialization, Military Service, and Class Reproduction: The Experiences of Israeli Soldiers. Sociological Perspectives. Volume 51, Issue 2

Malach-Pines, A. and Shade, A. (2004). The Making of Israeli High-technology Entrepreneurs: An Exploratory Study. The Journal of Entrepreneurship, volume 13, issue 1

Malchi, Asaf (2018). The "People's Army"? The Israel Democracy Institute.
https://en.idi.org.il/articles/24626

Maoz, I. (2006). The Effect of News Coverage Concerning the Opponents' Reaction to a Concession on Its Evaluation in the Israeli-Palestinian Conflict. The Harvard International Journal of Press/Politics. 11 (70).

Marcus, D. Raphael (2018). The Israeli Revolution in Military Affairs and the Road to the 2006 Lebanon War. Reassessing the Revolution in Military Affairs. Springer

Melman, Y. (1993). The new Israelis. Tel Aviv: Shoken Publications.

Minnen, Jonathan; and Kirsch, Gregory (2016). Israel: Small Country, Innovative Giant.
https://www.sgrlaw.com/ttl-articles/the-times-they-are-a-changin-copyright-law-and-the-business-of-music/

Niebel, T. (2018). ICT and economic growth – Comparing developing, emerging and developed countries. World Development, *104*, 197-211. https://doi.org/10.1016/j.worlddev.2017.11.024

OECD (2018). Embracing Innovation in Government Global Trends.
http://www.oecd.org/gov/innovative-government/embracing-innovation-in-government-2018.pdf

OECD (2018a). Economic Survey: Israel. https://www.oecd-ilibrary.org/economics/oecd-economic-surveys-israel-2018/inequality-and-poverty-remain-high_eco_surveys-isr-2018-graph5-en

Peri, Y. (2006). Generals in the Cabinet room: How the Military Shapes Israeli policy, Washington DC., United States Institute of Peace Press. http://www.tau.ac.il/institutes/herzog/generals.pdf

Rothke, Ben (2018). The Security Meltdown. https://www.csoonline.com/blog/the-security-meltdown/

Rosenberg, David (2018). How Israel is turning its high-tech into global political power.
https://fathomjournal.org/how-israel-is-turning-its-high-tech-into-global-political-power/

Sanders, Ralph (2000). An Israeli Military Innovation. https://apps.dtic.mil/sti/pdfs/ADA483682.pdf

Schwab, K. (2018). The Global Competitiveness Report. World Economic Forum.
http://www3.weforum.org/docs/GCR2018/05FullReport/TheGlobalCompetitivenessReport2018.pdf

Senor and Singer (2009), Start-up Nation: The Story of Israel's Economic Miracle, HACHETTE GROUP US

Shachmurove, Yochanan (2018). The Israeli Miracle: Innovation and Economic Growth
http://dx.doi.org/10.2139/ssrn.3261385

Sucharov, M. (2005). Security Ethics and the Modern Military: The Case of Israel Defense Forces. *Armed Forces & Society*. 31 (2).

Swed, Ori; and Batler, John Sibley (2013). Military Capital in the Israeli Hi-tech Industry. Armed Forces & Society. Volume 41, Issue 1

Tabansky, Lior (2016). Towards a theory of cyber power: The Israeli experience with innovation and strategy. Published in: 2016 8th International Conference on Cyber Conflict (CyCon)

Tarasiuk, Renata (2021). Geocultural Aspects of the Security Policy of Contemporary Israel.
https://bibliotekanauki.pl/articles/1807630

Tariq, Dana (2020). A Cruel Innovation: Israeli Experiments on Gaza's Great March of Return.
https://brill.com/view/journals/soi/8/2/article-p175_175.xml?fbclid=IwAR3LkfOLKAvp9kGNzwnNzMqcqNW6ygwQEuDeJCAZAEkOJagfHidx44NAWCI

Wamg, Jue. (2017). Innovation and government intervention: A comparison of Singapore and Hong Kong. https://www.sciencedirect.com/science/article/pii/S0048733317302147

Ziskind, Julie, and Brake, Annika (2019). From Israel's 'start-up nation', 4 lessons in innovation. World Economic Forum. https://www.weforum.org/agenda/2019/09/israel-start-up-nation-innovation/