

VC Funding Elements in US-Israel Case and Application to China-Korea

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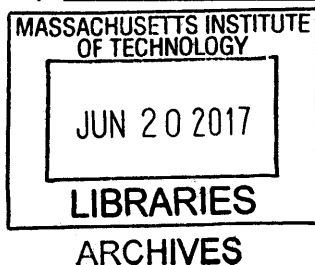
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By

Anna Lee

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on May 12, 2017 in Partial Fulfillment of the
requirements for the Degree of Master of Science in
Management Studies.

ABSTRACT

The success of the startups ecosystem that Israel has built has become powerful even in a global context. How could it be possible for such a small country to claim a reputation as the “Startup Nation”, and how could the small startups from Israel gain international competitive power and expand their business in the global market successfully? The primary purpose of this study is to identify the elements that brought success to Israeli startups in the global market, especially related to the relationship with U.S. venture capital firms and to find the takeaways to apply to startups in South Korea - specifically, related to the relationship with Chinese venture capitals.

The study compares the similarities and differences between the circumstances that Israel and South Korea face and analyzes the Israeli startups’ success elements, researching three Israeli companies in depth. The research shows the strong relationship between successful Israeli startups and investors from the United States who placed huge roles in bringing the startups to the global market. Through analyzing the position of Israeli startups in the global market and the relationship with U.S. venture capital firms and conducting interviews and surveys with entrepreneurs in South Korea, the study finds three takeaways from the relationship between Israeli startups and U.S. venture capitals with potential to create more synergy between Korean startups and Chinese venture capital firms.

Thesis Supervisor: Jake Cohen

Title: Senior Associate Dean for Undergraduate and Master's Programs

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Table of Contents

Table of Contents.....	5
1. Introduction.....	7
1.1 Motivation and research problem.....	7
1.2 Definition and Methodology.....	8
1.3 Thesis Structure.....	10
2. Comparison between Korea and Israel.....	11
2.1 Similarities between Korea and Israel.....	11
2.1.1 Size of Country.....	11
2.1.2 History: Foundation and Invasion.....	13
2.1.3 International Relations and Current Risks.....	14
2.1.4 Outstanding Science and Technology.....	15
3. Israel as a Startup Nation.....	16
3.1 Statistics of Israel Startups.....	16
3.2 Case Studies.....	17
3.2.1 Teva.....	17
3.2.2 Check Point.....	20
3.2.3 Waze.....	22
4. Israeli Startups and U.S. Venture Capitals.....	25
4.1 U.S. Venture Capitals for Israeli Startups.....	25
4.2 History.....	26
4.3 Success Factors of Israeli Startups in the US Market.....	27
4.3.1 Government Support to foreign VC Investment.....	27
4.3.2 Openness to Foreign Investors and Foreign Markets.....	28
4.3.3 High-quality Incubators/ accelerators.....	29
4.3.4 Globalization from Day One.....	30
5. Korean Startups and Chinese Venture Capitals.....	32
5.1 Startups and the Venture Market - Past and Present.....	32

Table of Contents

5.2	Business Relationships with China.....	34
5.3	Causes of Weak Performance	36
5.3.1	Low Chance of M&A	36
5.3.2	Cultural Difference and Lack of Expertise.....	38
5.3.3	Difficulty in Globalization and Localization.....	40
6.	Conclusions.....	42
6.1	Lessons from Israel to apply.....	42
6.2	Limits to Replicability.....	43
	Bibliography	45
	Appendix	48
	Acknowledgements	51

1. Introduction

1.1 Motivation and research problem

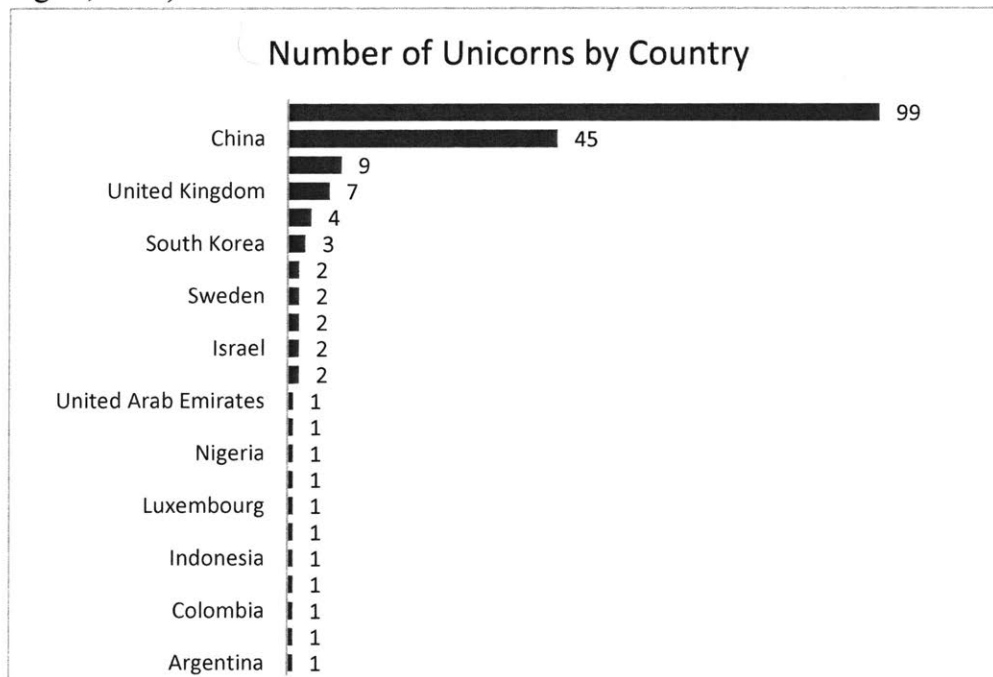
We have never experienced an era in which we have valued “startups” more than today. New types of jobs and tasks related to startups have even been created recently, such as enterprise coaching, accelerators/incubators, crowdfunding, and so on. The boom of startups is not only in well-developed countries like the United States or European countries but also in developing nations such as China or India and developed-but-still-growing countries like Israel and South Korea. According to statistics from 2016, there were 33,360 startups in Korea, which is 4 times more than in 2000 (Korea Venture Capital Association, 2017). Many of the startups dream of being the next Uber, Facebook, or Airbnb. However, among the numerous startups, companies successful enough for us to hear their names in news and media are relatively few. In particular, few Korean startups are exposed in the global market; although many startups from the United States are well known all over the world, and more Chinese or Israeli startups have gradually gained public attention.

While doing research about successful startup ecosystems and visiting Israel, I recognized similarities between Korea and Israel on a national level. Moreover, Israel’s business relationship with the United States seems similar to Korea’s relationship with China. Israel has a close relationship with the U.S. because Israel has great startups with high technologies, but does not have much access to capital and large markets, which the U.S. can provide. Likewise, advanced and innovative Korean companies’ technology and business ideas have nowhere to scale because the domestic capital and market are quite small. On the other hand, China, geographically located right next to Korea, has huge capital resources and a gigantic market. Under similar circumstances, Israel has gained

worldwide fame as the “Startup Nation” while startups in Korea are still struggling. Through this research, I have undertaken to explore how Israeli startups could be so successful, especially related to U.S. capital and markets, and what Korean companies might need in order to access Chinese capital and markets.

1.2 Definition and Methodology

Prior to the beginning of my research on successful startups, I wanted to find the proper way to define the success of startups. People use the term “unicorn”, defined by Aileen Lee in 2013 as a private start-up company valued at over \$1 billion, to describe successful startups (Lee, 2013). Facebook and LinkedIn were remarkable unicorns and were listed on the NASDAQ in 2012 and NYSE in 2011, respectively. Based on research in March 2017, there are 188 unicorn companies worldwide, with a cumulative value of \$647 billion. Uber, Xiaomi, Didi Chuxing, Airbnb, and Palantir are the unicorns with the highest value of \$68 billion, \$46 billion, \$33.8 billion, \$29.3 billion, and \$20 billion, respectively (CB Insights, 2017).



Interestingly, among the unicorns, 99 are startups from the United States, 45 from China, 9 from India, and 7 from the United Kingdom. Only three Korean companies including Coupang, an e-commerce marketplace; Yello Mobile, a mobile software service provider; and CJ Games, game developer and publisher, are on the list of Unicorns. I concluded that countries with rich capital and high population have the advantage in producing unicorns. According to the International Monetary Fund, the top five countries with the largest number of unicorn companies: the United States, China, India, the United Kingdom, and Germany, all have high GDPs and populations.

Country	GDP (millions, USD)	GDP Ranking	Population	Population Ranking
United States	18,569,100	1	324,118,787	1
China	11,218,281	2	1,382,323,332	2
India	2,607,397	6	1,326,801,576	3
Germany	3,466,639	4	80,682,351	16
United Kingdom	2,629,188	5	65,111,143	21
South Korea	1,411,246	11	50,503,933	27
Israel	318,386	34	8,192,463	98

(International Monetary Fund, 2016)

However, the list of unicorns does not include startups that had less capital and user bases but were bought out or acquired by big companies. In addition, it cannot exclude the possibility of Unicorpse, the combination of the words Unicorn and Corpse, to explain overvalued startups due to the unicorn bubbles (MullinsJohn, 2016). Therefore, the term “unicorn” cannot be an accurate measurement to evaluate the successful startups for small or medium sized countries like Korea; so I decided to use startups that were listed on the stock market for an initial public offering (IPO) or were merged/acquired by other companies (M&A) as successful startups.

1.3 Thesis Structure

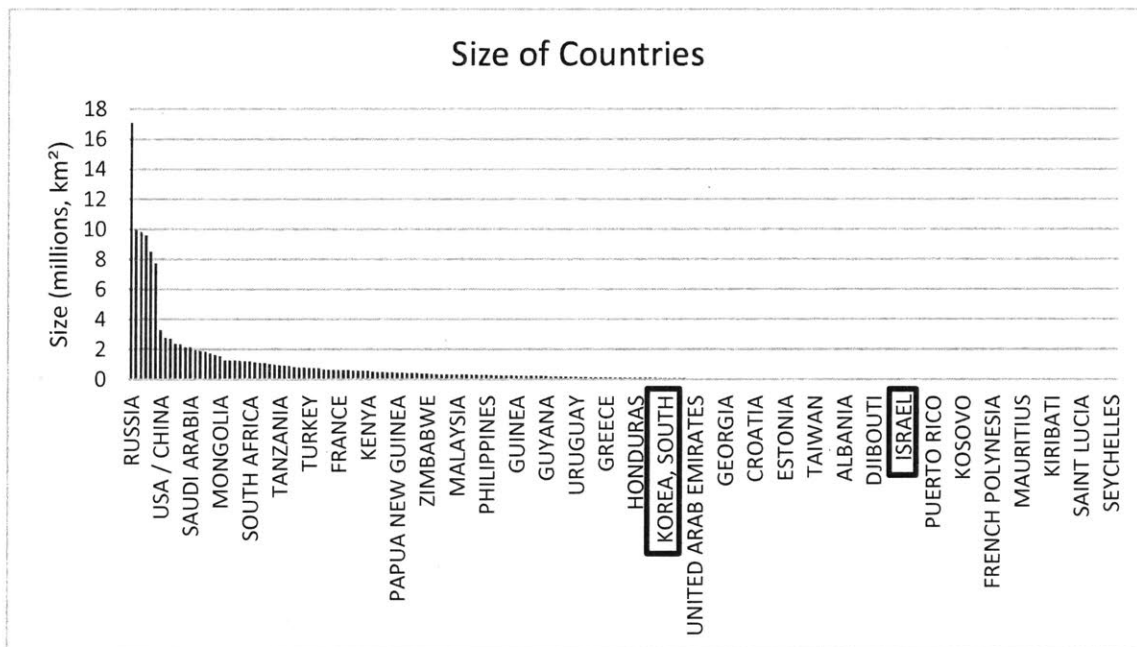
In Chapter 1, this thesis introduces the motivation and background of the research. Prior to finding the elements of which Israeli startups could be successful in the global market and the takeaways to apply to Korean startups, I wanted to show the similar situations that affect the startup culture in Israel and South Korea in the past and present in Chapter 2. In Chapter 3, the position of the Israeli startups in the global market is stated, using statistical data. Additionally, three in-depth case studies of the well-known Israeli startups Teva, Check Point, and Waze show the elements how they achieved their global positions and fame. I found that three cases have in common that they all have strong relationships with U.S. venture capitals, so Chapter 4 focuses on the relationships between Israeli startups and U.S. venture capitals, analyzing the history of the relationships and the factors that made the strong relationships possible. Chapter 5 shows the position of startups in South Korea, especially related to the Chinese market and through conducting interviews and surveys with entrepreneurs in South Korea, analyzes the reasons why they could not perform as well as Israel startups. Finally, in Chapter 6, I offer three suggestions for creating more synergy between Korean startups and Chinese venture capital firms, and identify the obstacles that limit the replicability of the relationship between Israeli startups and U.S. venture capitals.

2.Comparison between Korea and Israel

2.1 Similarities between Korea and Israel

In many Asian countries like Korea, people are less exposed to news from the Middle East. The news mainly focuses on information about the Middle East limited to oil, war, gender gap, or national tension; so we lack information about Israel as well. Fortunately, the recent discoveries and interest about the startup ecosystems have shed new light on Israel, the “Startup Nation”. Israel’s startup ecosystem and great exit histories have been already noticeable for decades in the West; so I decided to learn more about Israel while studying about entrepreneurship in MIT. Interestingly, there are many similarities between Israel and Korea.

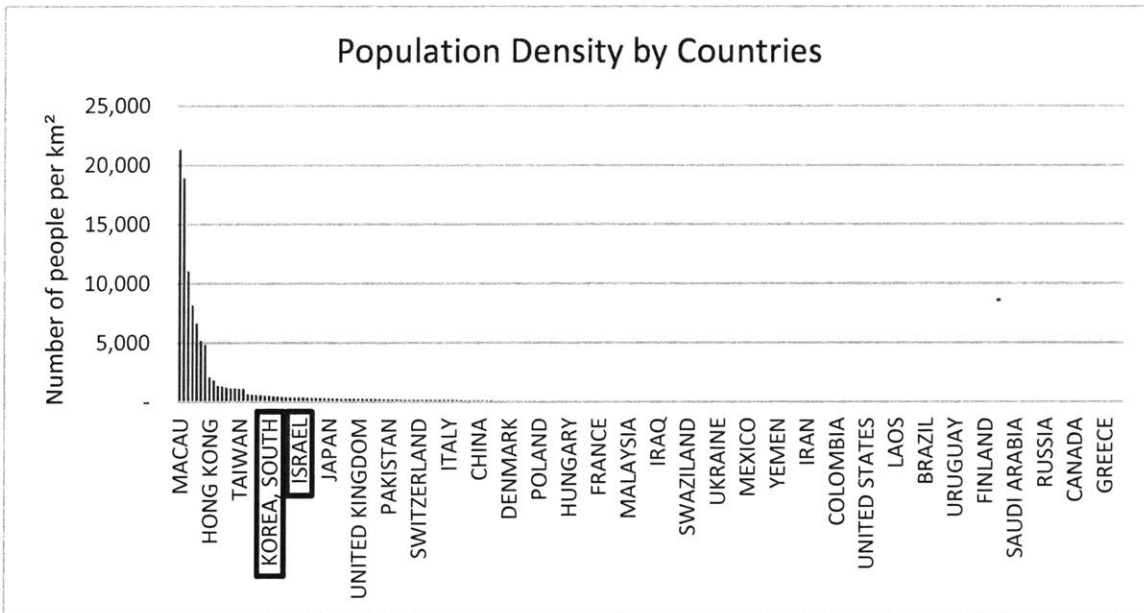
2.1.1 Size of Country

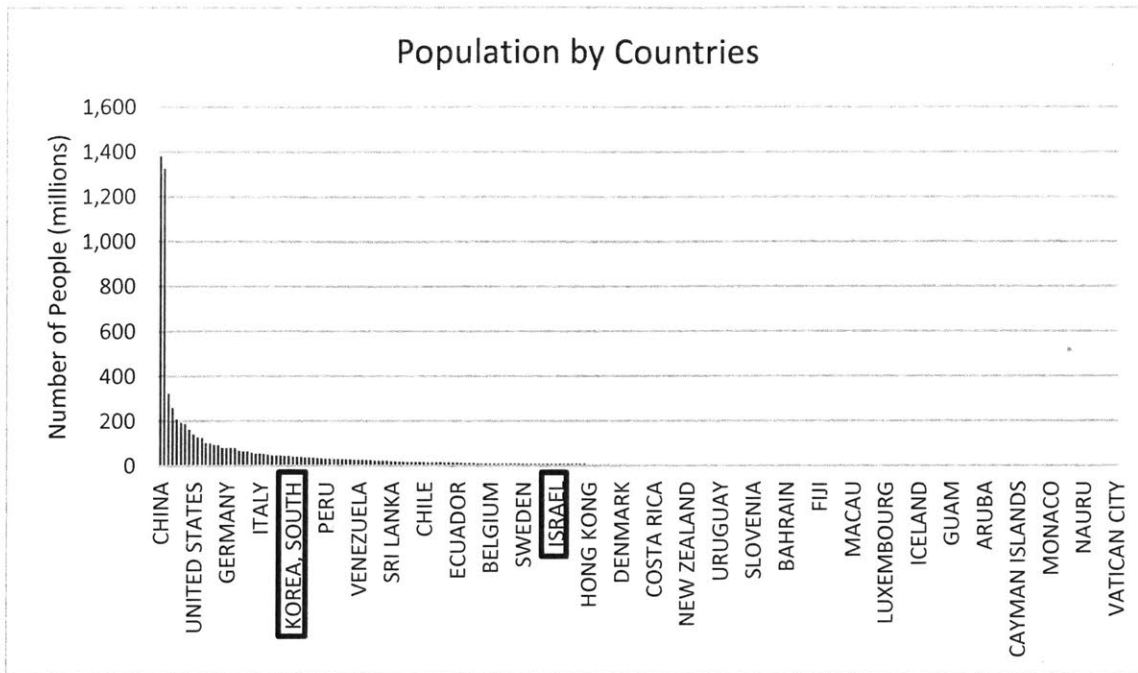


(Central Intelligence Agency, 2017)

Both Korea (considering only South Korea) and Israel are relatively small countries.

While China and the United States, the top two importers for Korea, are about 10 million km^2 each, Korea and Israel are much smaller, only about $100,000km^2$ and $20,000km^2$, respectively. The size of Korea and Israel is also slightly different, but as shown in the graph, the difference is much smaller than the one with those big countries. Despite of the small country size, Korea and Israel both have a relatively high density of population. In Korea and Israel, there is an average of 450 people in one square kilometer while an average of 150 and 30 people live in one square kilometer in China and the United States, respectively (The World Bank, 2015). Seoul, the capital of Korea, and Busan, the most international city in Korea, have the highest population densities, and they produce most of the country’s startups. Similarly, Jerusalem, the capital of Israel, and Tel Aviv, the most international city in Israel, have the highest population densities, and are the two centers of startups in Israel.





(Central Intelligence Agency, 2017)

In spite of the high density of population in Israel and Korea, both countries' total populations are much smaller than the populations of the countries which produce many startups. The limited and small markets encouraged Israel and Korea to target bigger markets abroad such as the United States or China.

2.1.2 History: Foundation and Invasion

Korea and Israel have similarities in the countries' histories as well. The first country in Korean history called Gojoseon (or Ancient Joseon) was founded in 2,333 BC. In 1910, Koreans lost the ownership of their country, and Korea was colonized by Japan. After 35 years of the colonization, Korea was liberated from Japan's colonial rule in 1945. Finally, on August 15, 1948, the Republic of Korea was formally established with a new government and the first president. Surprisingly, the State of Israel was also established in 1948. On 14 May 1948, David Ben-Gurion, the head of the Jewish Agency, declared the

establishment of the State of Israel the day before the expiration of the British Mandate (Office of The Historian). Both countries had a long history of foreign invasion because of their open geographical conditions. The Korean peninsula, in which three sides are surrounded by sea, has Japan in the Southeast and China in the Northwest, and has open access to other countries through the Pacific Ocean. Israel is also located right next to many countries such as Jordan in the East, Egypt in the South, and Lebanon and Syria in the North. European and African countries can also access Israel through the Mediterranean Sea, located in the West of Israel. These geographical conditions of Korea and Israel created the threat for surrounding countries to break into Korea and Israel.

2.1.3 International Relations and Current Risks

Both countries still have risks due to the geographical conditions. Korea (South) has a sensitive relationship with North Korea, and the level of North Korea's threat to South Korea and other countries like the United States has been amplified continuously. According to CNN news on April 18th, 2017, "US Vice President Mike Pence reiterated this week that the "era of strategic patience" was over, days after Pyongyang attempted another missile launch and analysts warned a sixth nuclear test could be imminent" (GriffithsJames, 2017). Likewise, Israel's relationship with Lebanon, Syria and The Palestinian Territories is not positive. Until now, if there is an Israeli stamp or a visa on the passport, it is troublesome to enter those hostile countries. The risks in these two countries obligate men in Korea and both men and women in Israel to join mandatory military service for 2 to 3 years. In Israel, women with rifles and military uniforms on the streets or in the trains are common. Ironically, the risks in Israel produced many risk-taker entrepreneurs and became a foundation of the Israeli startups culture. One unforgettable quote from an Israeli

entrepreneur was “Failing business or losing money is not a big risk. We have much more serious risks that threaten our lives”.

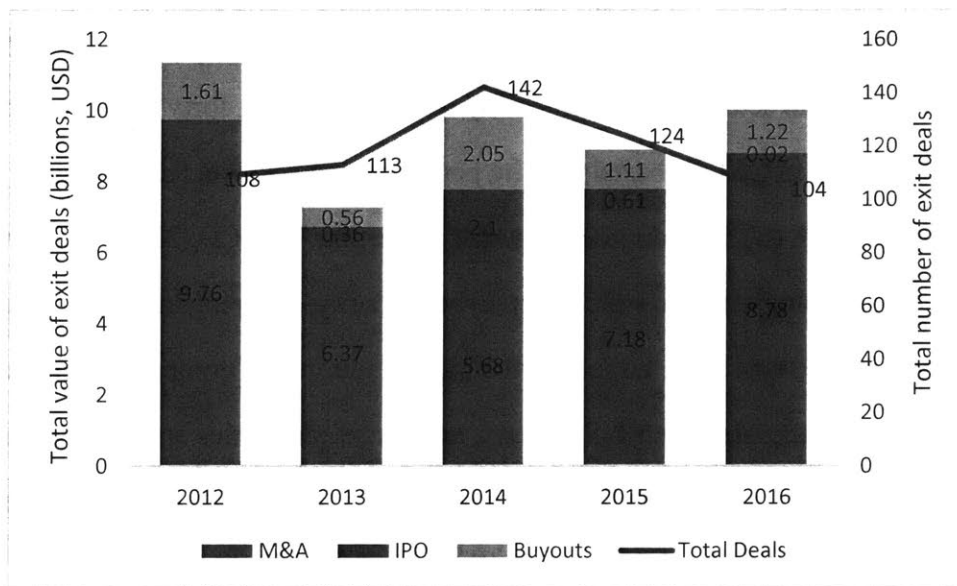
2.1.4 Outstanding Science and Technology

The last similarity I want to focus on is the strength in science and technology of both Korea and Israel. Korea and Israel are in the top ten most technologically advanced countries in the world with the United States, Japan, India, China, Estonia, Canada, Germany, and Russia (CarmichaelCody, 2016). Korea’s semiconductor and high-tech products are famous throughout the world, and Korea’s top three export products: electrical machinery and equipment (\$134.3 billion, 27.1% of total exports), vehicles (\$62.7 billion, 12.6%), and machinery including computers (\$58.3 billion, 11.8%), are all categorized as technology (WorkmanDaniel, 2017). In addition, Korea is the number one country with the highest investment in science and engineering education among forty of the world’s most advanced countries in OECD, based on “the percentage of science, technology, engineering, or math (STEM) degrees awarded per capita” (OECD, 2015). Likewise, Israel’s high technology industry including cyber security, mapping, and agricultural technology is in the front rank. Israel has the highest number of companies on the NASDAQ stock market as a non-US country, and those companies are mostly technology companies. Moreover, many Israelis have opportunities for training and practice of advanced and practical technology in the military. In networking events in Israel, I met high-tech startup teams and many of them formed their companies with members from Unit 8200, the elite Israel Defense Forces intelligence unit.

3. Israel as a Startup Nation

3.1 Statistics of Israel Startups

In spite of the small size of the country and the population, Israel has won renown as the “Startup Nation”. This small country with an 8.380 million population in 2015, which is about 38 times smaller than the United States (321,419 thousand in 2015) (The World Bank, 2015), provides nutritious ecosystems for startups to flourish in. Tel Aviv, a major city in Israel known as the center of Israel’s finance and technology, is considered as one of top 10 global startup hubs. The ranking in the top 10 has been changed and defined slightly differently by researchers, but Tel Aviv always keep the position in the top 10 startup hubs with Silicon Valley, New York City, Beijing, and London (SparkLabs, 2016).



In 2016, the Israeli startup ecosystem generated 104 exit deals at a total of \$10 billion including 93 M&As, 8 buyouts, and 3 IPOs. Compared to 2015, the total value of the exits increased 12% with more M&A deals but less IPO exits, while the total number of exit deals actually decreased. This indicates that the average deal size grew. Especially,

Playtika, an Israeli social game platform raised the average size of exits in 2016. Giant Integrative Group, a Chinese online game developer, acquired Playtika for \$4.4 billion, the largest M&A deal in 2016.

<p>\$4.4B</p> <p>Internet</p> <p> Playtika</p> <p> GIANT</p>	<p>\$811M</p> <p>Semiconductors</p> <p> EZ CHIP</p> <p> Mellanox</p>	<p>\$430M</p> <p>Software</p> <p> ravello systems</p> <p> ORACLE</p>	<p>\$375M</p> <p>Life Sciences</p> <p> MIS</p> <p> Dentsply Sirona</p>	<p>\$320M</p> <p>Semiconductors</p> <p> lebia</p> <p> CISCO</p>
<p>\$293M</p> <p>Software</p> <p> CloudLock</p> <p> CISCO</p>	<p>\$242M</p> <p>Communications</p> <p> RR Media Rethink. Reinvent</p> <p> SES your solid-state company</p>	<p>\$212M</p> <p>Semiconductors</p> <p> altair semiconductor</p> <p> SONY</p>	<p>\$175M</p> <p>Internet</p> <p> freeD FREE DIMENSIONAL VIDEO KEYWAY TECHNOLOGIES</p> <p> intel</p>	<p>\$110M</p> <p>Life Sciences</p> <p> GALIL MEDICAL Leading Through Innovation</p> <p> BTG</p>

Top 10 deals in 2016 (IVC Research Center, 2016)

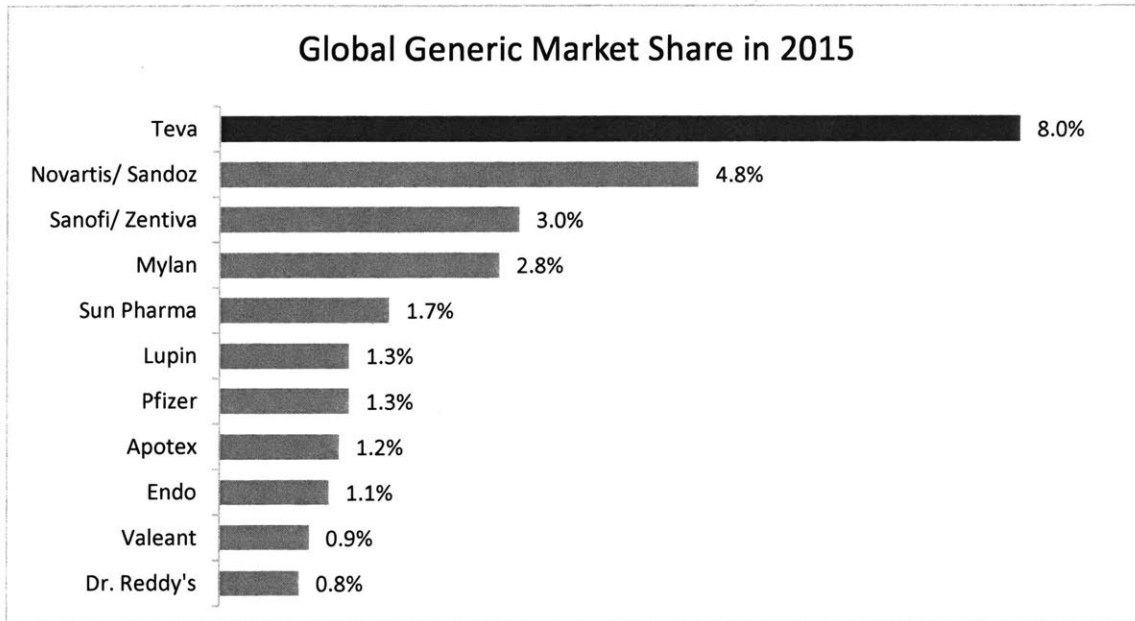
3.2 Case Studies

As well as Playtika, many successful startups such as Teva, Check Point, and Waze have been generated in Israel. These successful Israeli startups not only became popular domestically, but also successfully grabbed worldwide attention. Their success and the major ingredients that made it possible would be worth noting.

3.2.1 Teva

When we talk about successful Israeli startups, one of the companies we can't leave out is Teva (NYSE: TEVA). Teva, which means "Nature" in Hebrew, is the number one Israeli multinational Pharmaceutical Company. Its headquarter is located in Petah Tikava, Israel, but we can find Teva not only in Israel but also in North America, Europe, South

America, and Asia. The company was founded as a small wholesale drug business in 1901, and has now grown to be the largest generic drug manufacturer throughout the world. The company, which made 50 million USD in sales in 1980, recently made around 22 billion USD in sales in 2015, which was 400 times larger within 25 years. Teva has 8% of the worldwide generic drugs market shares, the largest market share in the global generic drugs market, and 25% of the worldwide biosimilar market shares, the second largest market share in the global biosimilar market (Teva Pharmaceutical Industries Ltd., 2017).



(Teva Pharmaceutical Industries Ltd., 2016)

Although Israel has such a small market and capital as Korea does, how could Teva achieve such a huge success? There are three major factors behind this success: globalized strategy, government support, and expansion through foreign IPOs and foreign M&As.

1) Globalized Strategy

Teva has the number one position in the global generic drug market in North America and the top 3 in 26 countries in Europe. It is also expanding its market position in Asia and

South America, including Vietnam, Brazil, and Korea (Teva Pharmaceutical Industries Ltd., 2016). One of the reasons why the company could smoothly penetrate into different regions is its strategy to develop products based on international standard and encourage exports of the products. For example, Teva agreed on the Mutual Recognition of Drug Manufacturing Inspection with the European Union in 2012, so that the company could reduce the process procedures and time for imports and exports. In addition, Teva registered its products at the U.S. Food and Drug Administration and the European Medicines Agency, so its generic drugs could be used internationally.

2) Government Support

The Israeli government was also supportive for Teva to grow. The government established the Weizmann Institute of Science, a government research and development institute, and Yeda Research Development Company Ltd. in 1967 to support and encourage improvement in science and to industrialize technology. They also signed a contract for the transfer of technology with Teva in 1971, technology that valued more than 1 trillion USD.

3) Expansion through Foreign IPOs and Foreign M&As

The biggest booster to grow this Israeli small company as an internationally successful company was that Teva expanded its business through foreign IPOs and foreign mergers and acquisitions (M&As). In 1948 when the country of Israel was founded, its local drug market was also formed, and Teva was listed on the Tel Aviv Stock Exchange in 1951. The company became Israel's largest healthcare company in 1976 and started the first journey to Europe by acquiring Orphahell in Netherlands. In 1982, Teva entered the U.S. market after the passing of the Hatch-Waxman Act, and traded on the NASDAQ stock market. In the 1990s, the company actively penetrated different markets by acquiring companies from

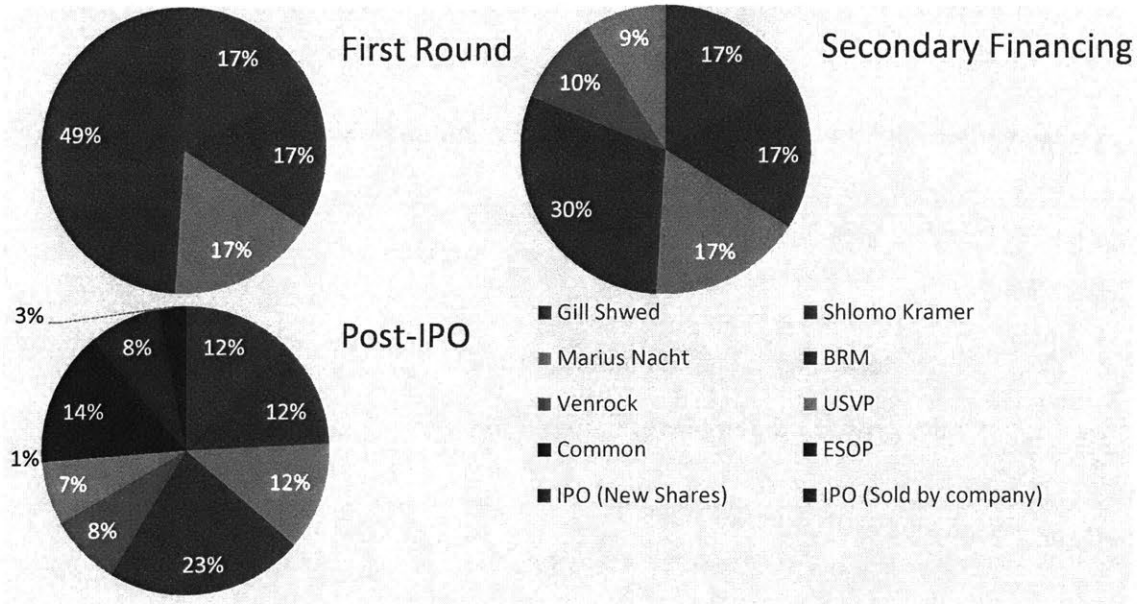
countries including United States, United Kingdom, Italy, Germany, Hungary, Canada, France, Switzerland, Turkey, Spain, and Japan (Teva Pharmaceutical Industries Ltd., 2017). In 2010, “The company received \$132 million of development capital from Soros Fund management” (PitchBook, 2017), an investment firm in New York, and expanded its business to South Korea in 2012 by creating a joint venture with Handok Inc., a Korean pharmaceutical company.

3.2.2 Check Point

Innovation and Development in the cybersecurity industry is one of the major strengths of Israel’s technology sphere. According to the Cyber Research Databank, there were “9 IPOs or M&As of Israeli cybersecurity companies with an average price tag of \$60 Million in 2016” (Chachak, 2017). Check Point Software Technologies, Ltd. (NASDAQ: CHKP) is also one of the representatively successful Israeli multinational cybersecurity companies, providing software and hardware for cybersecurity. Its international headquarter is located in Tel Aviv, Israel, and there are about 4,300 employees worldwide including Israel, North America, Europe, Asia, and South America. Gil Shwed, Shlomo Kramer, and Marius Nacht founded Check Point in 1993, and the company opened a U.S. head office in California and signed the Original Equipment Manufacturer (OEM) agreement with Sun Microsystems and HP in 1995. One year later, Check Point went public on the NASDAQ stock market, and became the largest pure-play security vendor throughout the world. The company kept expanding by acquiring different businesses including, for example, the security appliance business from Nokia in 2009, and entering into the small business market with a series of small business appliances. Nowadays, Check Point has gained fame as a company with products that “100% of Fortune 100 firms and 98% of the Fortune 500 use” (Ungerleider, How Check Point Became The Fortune 500’s Cybersecurity Favorite, 2013). The success of Check Point shows the common characteristics of many Israeli startups: receiving

funding from the United States and forming startups with military members.

1) Investors from U.S.A



(Check Point, the Israel success story, 2011)

The company with market value of about 18 billion USD in 2017 surprisingly didn't raise much external funds. For the first round, Check Point raised funds from BRM Group, a private investment fund of Barkat and Rakavy family in Israel. Then, two American venture capitals in Silicon Valley, Venrock and US Venture Partners (USVP), bought some parts of BRM's shares in secondary financing. In 1996, the company was listed on the NASDAQ only 3 years after being founded. The U.S. venture capitals' financing and the IPO in the U.S. stock market helped Check Point to scale the business globally.

2) Military Principles to Business

As mentioned in Chapter 2, Israelis, including both males and females, have a duty of serving in national defense. When I visited Israel, I realized that many startups form teams

with members from the same military units; so the teamwork, leadership, technical specialties, and any other skills from military move over to civil life, including to a startup business. Gil Shwed and Shlomo Kramer, Check Point co-founders, served in a team in Unit 8200, the elite Israel Defense Forces intelligence unit, “responsible for collecting signal intelligence and code description” (Wikipedia, 2017). Their experiences related to IT and Cybersecurity under severe circumstances from Unit 8200 definitely worked as a great stepping-stone for Check Point and a tool to build the scalable business.

3.2.3 Waze

In 2013, Waze Mobile, an Israeli company founded by Ehud Shabtai, Amir Shinar, and Uri Levine in 2007, grabbed the public attention. Google, Facebook, and Apple, the representative IT companies in Silicon Valley, showed their interest in buying this Israeli company. Waze Mobile is a GPS navigation application provider and its application, called Waze, was strongly differentiated from other GPSs by user engagement through crowdsourcing. The crowdsourcing allowed users to report traffic accidents or any error on the map, so the information could be more accurate and better updated. In addition, users could see other users’ speeds and locations, which entertained its user community with social media elements. In January 2012, 12 million users had downloaded Waze globally (GilbertJason, 2012). More surprisingly, in July 2012, the application had secured 20 million users, and a half of the users joined Waze only in 6 months (LardinoisFrederic, 2012). The growth of Waze was remarkable. At the end, the fortunate company who got a chance to acquire Waze Mobile was Google for around 1 billion USD. At the time of Google’s acquisition, Waze had 50 million users, and it was even more surprising because it only took about 5 years for a small startup to reach this huge success (CohanPeter, 2013).

After Google’s acquisition, Waze’s technology innovation and business development didn’t slow down. In February 2017, Waze’s carpooling service started to be available in

the nine counties in Bay Area, California. The carpooling service has already been widely used in Israel by Moovit, an Israeli public transit application and mapping service provider, but this carpooling service is different from the one from Uber or Lyft. Waze's carpooling service helped "drivers to pair with riders with nearly identical commutes based on home and work address"; so the riders are commuters as well, not just full-time or part-time drivers. Behind this successful growth and acquisition story, we can see several characteristics of Israeli startups and entrepreneurs.

1) Risk Takers

In an Israel Lab class in the MIT Sloan School of Management, which amplified my interest in the "Startup Nation", a quote from Professor Jacob Cohen about characteristics of Israeli startups was so impressive that it stuck in my mind. He said, "An Israeli is already exposed to a lot of risk by living in Israel, so losing money is not a big deal compared to losing his/her life. That is why Israelis don't fear the failure of business". Co-founders of Waze chose to take risk although they already tasted failures in startups. For example, Uri Levine, the only co-founder who didn't join Google after the acquisition, said in an interview that Waze could succeed because the supportive environment and ecosystem allowed entrepreneurs not to fear any failure. He also mentioned his previous startups that couldn't shine as well as Waze, but his entrepreneurial adventure kept going. After Waze was sold to Google, he chose to start new companies such as FeeX and Engie Motors instead of joining Google. He emphasized on the importance of taking risks, saying that "even if you fail, the reality — and this is extremely important — is that the likelihood of a second time entrepreneur to be successful is five times higher than the first time regardless of what happened on the first time" (AlbaAlejandro, 2016).

2) Foreign investors and Google's acquisition

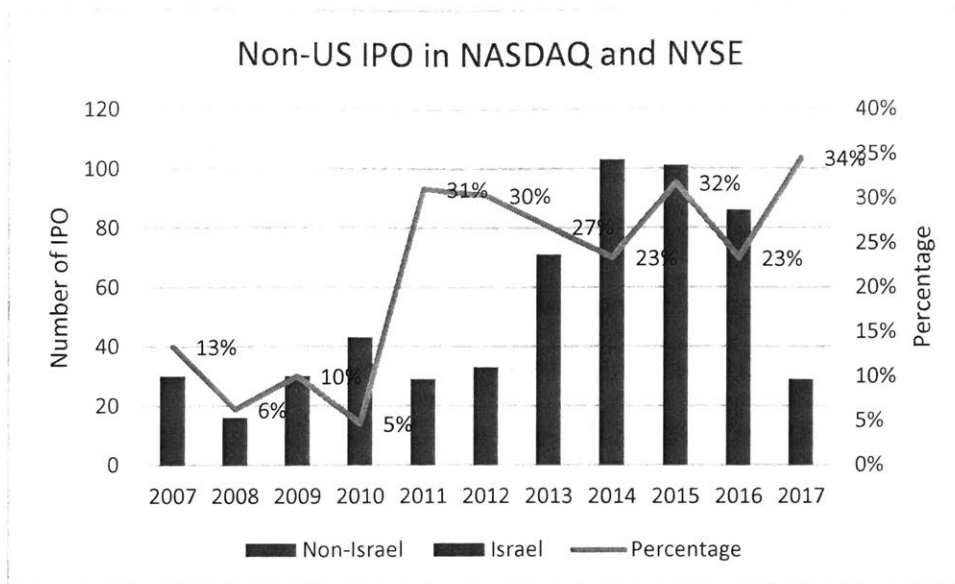
Like other successful Israeli startups, Waze also raised funds from foreign venture capitals as well as Israeli venture capitals. In 2008, the company received 12 million USD in Series A funding from two Israeli VCs, Magma Venture Partners and Vertex Ventures Israel, and one American VC, Blue Run Ventures. In 2015, Waze successfully raised another 25 million USD funding in Series B funding from the existing investors and one additional American venture capital called QUALCOMM Ventures. In Series C funding, Horizons Venture Limited, a Hong Kong VC, and Kleiner Perkins Caufield & Byers (KPCB), an American VC, invested 30 million USD (CapitalIQ, 2017) in the firm. Interestingly, all American venture capitals including Blue Run Ventures, QUALCOMM Ventures, and KPCB are located in California where Google is also located. Eventually, Waze was acquired for about 1 billion USD by Google in 2013 and became much more widely popular globally. Now, its Connected Citizens Program (CCP) shares traffic data with government agencies and departments of transportation for traffic analysis, road planning, and emergency work force dispatching (Ungerleider, Waze Is Driving Into City Hall, 2015)

4. Israeli Startups and U.S. Venture Capitals

4.1 U.S. Venture Capitals for Israeli Startups

Although the companies for the case studies of successful Israeli startups have been selected randomly, they had a common factor in that all of the three startups were funded by venture capitals in the United States. Many elements allowed Israel to be one of the top startup hubs, but as we can see from the examples of Teva, Check Point, and Waze, the role of U.S. venture capitals seems significant as one of the major elements for success. Of course, foreign venture capitals other than the venture capitals in the U.S also funded Israeli startups to grow them internationally, but the investments that U.S. venture capitals made into Israeli startups were relatively larger, and the business relationship between U.S.A and Israel was much stronger. The two Israeli unicorn companies, IronSource and Infinidat, were also funded by U.S Venture capitals. IronSource, an Israeli mobile software and service company with a current valuation of \$1.5 billion, was founded in 2010 in Tel Aviv, Israel, and it became a unicorn in August 2014. The company raised a total of \$105 million funds from two venture capitals, Access Industries in New York, USA and Saban Capital Group in Los Angeles, USA (Crunchbase, 2017). Infinidat, a hardware company in Israel, is also a similar case. The company was established in 2009 in Tel Aviv, Israel, and it joined a group of unicorn companies in April 2015 after TPG Growth, an American venture capital, invested \$150 million USD for series B investment. The recent value of Infinidat became \$1.2 billion (Crunchbase, 2017).

In addition, Israel has the highest number of companies listed on the U.S. stock market as a non-US country. Since 2011, Israeli companies listed on the NASDAQ



(Bloomberg, 2017)

and NYSE have been 25%~30% of all non-US companies. Especially, in 2014 and in 2015, the total number of companies listed on the U.S. stock market was much highest, and more than 100 Israeli companies each year were listed on the NASDAQ and NYSE. Currently, 89 active Israeli companies are on the NASDAQ stock market, and 53 of them, which is about 60% of all the active Israeli companies on NASDAQ, were funded from U.S. investors, mostly venture capitals (see **Appendix Active Israeli Companies on the NASDAQ Stock Market**).

4.2 History

Despite the reputation of Israel as the second best startup ecosystem and Israeli companies' active engagement with both local and foreign venture capitals, the advent of venture capitals and relationships with US firms do not have a long history relatively. In order to get some benefits of tax breaks and recruit relatively inexpensive-but-high-quality engineers and scientists, many US firms in the technology industry such as IBM and Intel

entered Israel to open research and development centers in 1970s. In 1977, American and Israeli government built the Binational Industrial Research and Development (“BIRD”) to connect Israeli startups and large sized high-tech firms in USA. “In its first fifteen years, BIRD invested approximately \$100 million in over three hundred companies or joint projects” (ZuckermanEzra & FeldsteinJanet, 2002). As a result, the large firms from the USA that had more experience in the global markets developed Israeli semiconductor and telecommunication technology in the 1980s. Israel started to build up the startup ecosystem through the emergence of venture capitals as well as the growth of the relationship between Israeli startups and large US firms. Athena Venture Partners, the first Israeli venture capital, and Veritas Venture Partners, the second Israeli venture capital, were established in 1985 and 1991, respectively, and Israel became one of largest venture capital markets in late 1990s. In addition to local venture capitals, many foreign venture capitals joined the Israeli market through the Yozma program, a government’s VC program.

4.3 Success Factors of Israeli Startups in the US Market

4.3.1 Government Support to foreign VC Investment

The Israeli government was one of the biggest supporters for the startup ecosystem. The Israeli government tried to stimulate investments in venture capitals through the INBAL program, the first Israeli VC support program introduced in 1991, providing “70% guarantees to investors in local venture capital funds” (BayganGünseli, 2003). However, the program was not successful to create a sensation of VC investment because INBAL program failed to find the leading and promising venture capitals and to attract international investors with global strategies. Moreover, the program brought some complaints due to the government’s frequent intervention and bureaucratic requirements. The failure, fortunately, gave lessons to the Israeli government to adopt new policies and better selection of venture

capitals as well as investors. Realizing the need of new policy and better selection, the Yozma program was initiated in 1993 after the failure of the INBAL program. Yozma program brought foreign financial and strategic investors to Israel and carefully selected the leading local venture capitals. Investments focusing on high tech startups in the early stage were made with less delay, which attracted other venture capitals to join. The Israeli government didn't intervene in the daily operation of Yozma funds, and the fund partners could buyout the government's stake 5 years after investment (AvnimelechGil, 2002).

The Yozma program accelerated VC investments in Israel. The number of venture capitals in Israel increased to more than 100 in the 1990s, compared to only two in the 1980s. Eight times more startups were created in the 1990s than the number of startups created in the 1980s, and 72 VC-backed companies went public cumulatively in the 1990s while only 3 VC-backed companies were listed in the 1980s (Pontus BraunerhjelmMaryann, 2006). Additionally, the Yozma program supported Israel to become globally known as a startup hub, partnering with global investors to do so. The foreign investors in Yozma funds included "Advent International Corp., the Van Leer Group of the Netherlands, the Walden Venture Capital Group, Oxton International Corp., Techno Venture Management of Germany, AVX, a subsidiary of Kyocera of Japan, Oxford Partners, Daimler-Benz, DEG of Germany, and MPV capital" (ZuckermanEzra & FeldsteinJanet, 2002). The Yozma program opened the era of VC investments in Israel and started the inflow of foreign capital.

4.3.2 Openness to Foreign Investors and Foreign Markets

In addition to the government's direct support programs that encouraged investments from domestic and global venture capitals, the government policies and banking systems that made it easy for foreign investors to enter the Israeli market took an important role in building the current startup ecosystem in Israel. Aside from some industries such as the

defense industry, Israel is quite open to foreign investors. “There is no screening of foreign investment and no regulation regarding acquisitions, mergers, and takeovers that differ from those that Israelis must follow” (U.S. Department of State, 2014). Furthermore, since January 1, 2003, foreigners could open shekel accounts, or Israelis could invest in the foreign markets without restriction because the Israeli shekel became freely convertible by the completion of foreign exchange liberalization process. The more supportive policies and systems to foreign investments increased the net inflow of direct foreign investments from \$4.818 billion in 2005, to \$5.51 billion in 2010, and finally to \$11.51 billion in 2015 (Then World Bank, 2015). The relationship and capital from foreign investors, especially from the United States, helped hundreds of Israeli high-tech firms to trade on the NASDAQ stock market and enhanced M&A deals by large foreign firms.

4.3.3 High-quality Incubators/ accelerators

When entrepreneurs have great business ideas but do not have much business knowledge or a business plan to build up the idea, they can find incubators and accelerators. Incubators and accelerators provide entrepreneurs with services including mentorship, networking opportunities, investment facilities, legal counsel, and management training to transform the ideas into real business items in the market. In Israel, the incubators and accelerators also took significant roles in forming the startup ecosystem as well as bringing VC investments. “Under the support of the Office of the Chief Scientist (“OCS”) of the Ministry of Industry and Trade, Tech Incubator Program (“TIP”) was introduced in 1991 to support the development of innovative technological ideas into viable startup companies. Technological incubators in the program are partially funded and administrated by OCS” (Israel Business Connection, 2017), and the program cumulatively created 27 tech incubators, which raised over 70 new startups every year (Israel Business Connection, 2017). Influenced by TIP, the number of accelerators became more than 260 in

July 2016 (LeichmanAbigail, 2016). These accelerators made Israel the No.1 manufacturer of startups throughout the world. With experts who have done business in U.S. markets or worked with U.S. companies, the incubators and accelerators provide practical advice, training, and networks for startups to strengthen their competitive advantage in the global market, including the U.S. market.

4.3.4 Globalization from Day One

Although all settings support a company to scale its business to the global market, the business can fail if products or services provided by the company are not attractive to the market. This has been the case for numerous companies when they failed to penetrate foreign markets. How could Israeli products or services be attractive to certain markets then? First, the right timing is crucial for products or services to be attractive, and Israeli companies typically spend only a short time to globalize their products because Israeli startups mostly plan to compete in the global market from day one. Israel is a small country with low buying power, so startups often initially target the users in the global market, especially the U.S. market. Short delay time in localizing or globalizing Israeli products reduces the danger of losing opportunities to competitors. Second, the right matching of products and markets is important to succeed in expansion. Services often take a longer time to be localized or internationalized and have a high chance of mismatch with the markets. However, Israel mainly introduces high-tech products, and technology-based products are universal and relatively less sensitive to cultural differences. Third, having mentors or advisors who have experience in scaling businesses to other markets or understand the opportunities and challenges of the new market professionally is one of the many reasons why Israeli products or services can be attractive. Before the country of Israel was formed, many Israelis used to live in various countries to escape the danger in the land of Israel, so a strong diversity exists in Israel now. The people who used to be in the

different countries were exposed to the different foreign markets; therefore, they are equipped with deep understanding of the culture, markets, and people there. Of course, they also tend to be bilingual or trilingual, which helps better collect the local information needed to find better ways to develop products targeting foreign markets.

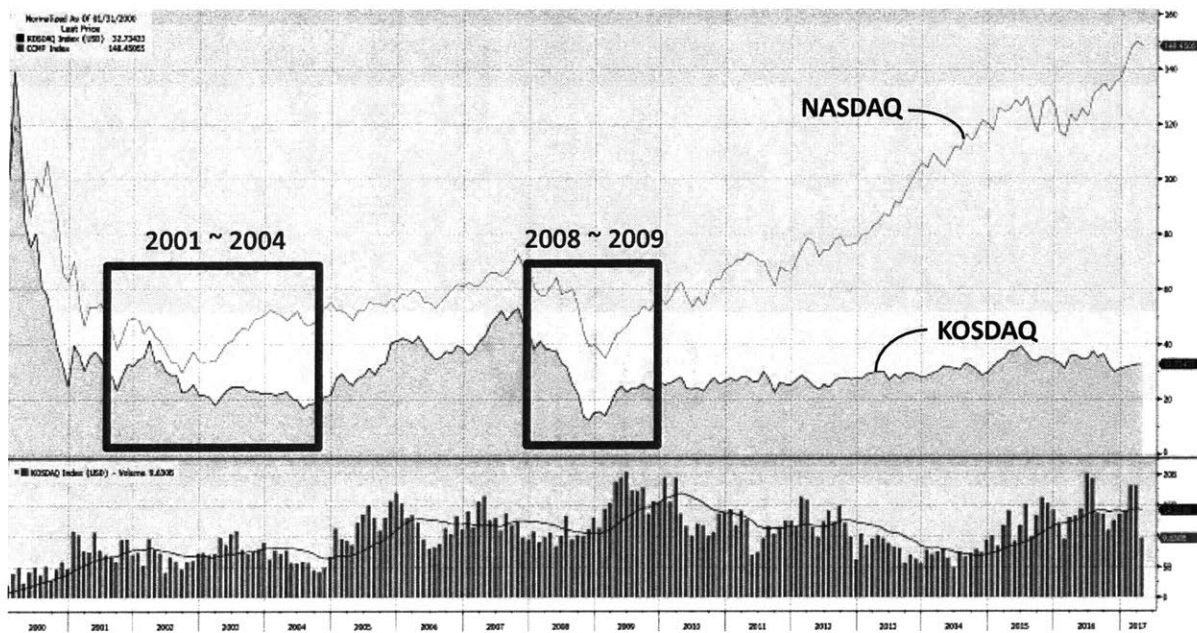
5. Korean Startups and Chinese Venture Capitals

5.1 Startups and the Venture Market - Past and Present

The history of the Korean venture capital and startup market started not too long ago, similar to Israel's. Although Korea is known as a developed business market due to multinational firms such as Samsung, Hyundai Motor Company, or LG Electronics, the terminology "startup" and "venture market" are still quite new for many Koreans. In late 1970s, the startup ecosystem started to form in Korea. From 1974 to 1985, the first four venture capitals were established, including Korea Industrial Technology Association (changed to "Aju IB Investment"), KTB Investment & Securities Co., Ltd., Q Capital Partners, and Korean Development Bank Capital, and the returns from the investments in startups started to prove their profitability because the values of many companies increased dramatically. However, in the early 1990s, The Korean market was still controlled by large firms like Samsung and Hyundai at its center because Korea concentrated most of her budget on economic development, and parts of the budget went to a few big firms chosen by the government. Even worse, the increase of the interest rate demotivated entrepreneurs to start new companies. As a result, only two new venture capitals were founded and the plans to establish six new venture capitals were canceled during this period.

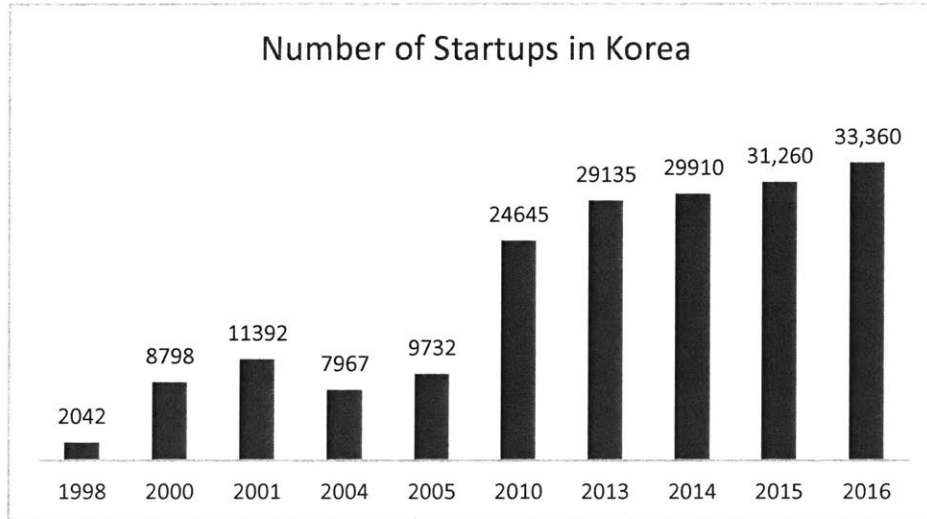
Realizing the importance of small and medium enterprises, the government planned to revitalize the startup market. In 1996, the Special Act on Incubating Venture Firms was made, and the Korea Securities Dealer Automated Quotation ("KOSDAQ"), one of the two main stock markets in Korea, was established in 1997. Small and medium sized companies bigger than 3 billion KRW of equity and 9 billion KRW (equivalent to 9 million USD) of company value can go public on the KOSDAQ stock market while large companies with over 30 billion KRW of equity can be listed on Korea Composite Stock Price Index 200

(“KOSPI”). KOSDAQ is similar to NASDAQ in the United States while KOSPI is similar to the Dow Jones Industrial Average. The newly formed policies and stock markets resulted in 156 new companies, and the stock prices dramatically rocketed. Yet, since Korea’s economy has a close relationship with America, the Korean market was heavily influenced by the U.S. economy, so the Korean market encountered depression during the economic recession in America in early 2000s and in 2008.



On the other side, the Korean government kept trying to encourage the venture markets and create a startup ecosystem. In 2010s, the government introduced a new policy called Creative Economy and Innovation, providing capitals for startups in different business stages. The Angel Matching Fund, one of the funding programs under the policy, raised \$91 million to support the very early startups, and Future Planning Fund with \$ 272 million of capital was raised to invest in the growing startups (series A and B). Additionally, the government provided tax benefits to angel investors and simplified the M&A process to vitalize the startup ecosystem. The increasing support and opportunity encouraged entrepreneurs to jump into the startup market. According to statistics, only 9,732 startups

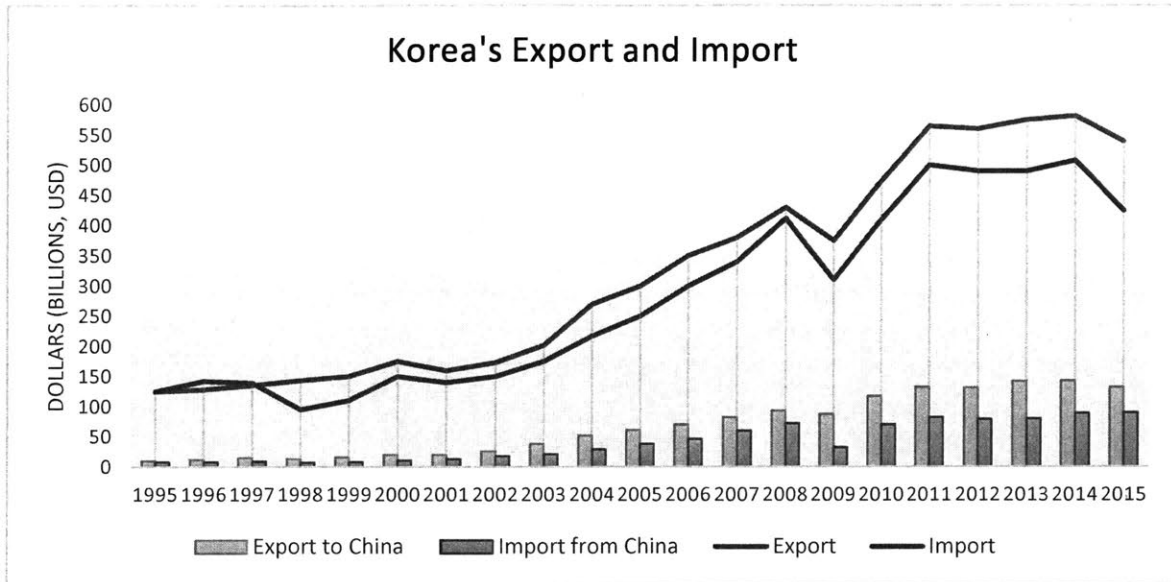
were registered in Korea in 2015. However, in 10 years, the number of startups increased more than 3 times (Korea Venture Capital Association, 2017).



5.2 Business Relationships with China

As many new enterprises came out to the market in Korea, another problem occurred in that the market was not big enough to embrace many businesses. In order to find bigger markets or newly emerging markets, many companies, especially the well-established ones in Korea started to knock on the global door. The increasing international trades explained the tendency of globalization. The Observatory of Economic Complexity developed from MIT Media Lab by Alexander Simoes shows that the international trades in Korea, both exports and imports, have increased continuously, ranking the 5th largest export economy in the world in 2015. In 2015, Korea reached net export of \$115 billion while the trade balance in 1995 was negative, with \$1.75 billion in net import. China was the top destination in both exports and imports with \$131 billion of exports (25% of total export, 538 billion) and \$90.1 billion of imports (21% of total imports, \$423 billion) in 2015. The United States with \$72.7 billion exports (14% of total exports) and \$42.7 billion imports (10% of total imports) and Japan with \$25.5 billion exports (4.7%) and \$44.6 billion

imports (11%) follow China (SimoesAlexander, 2015).



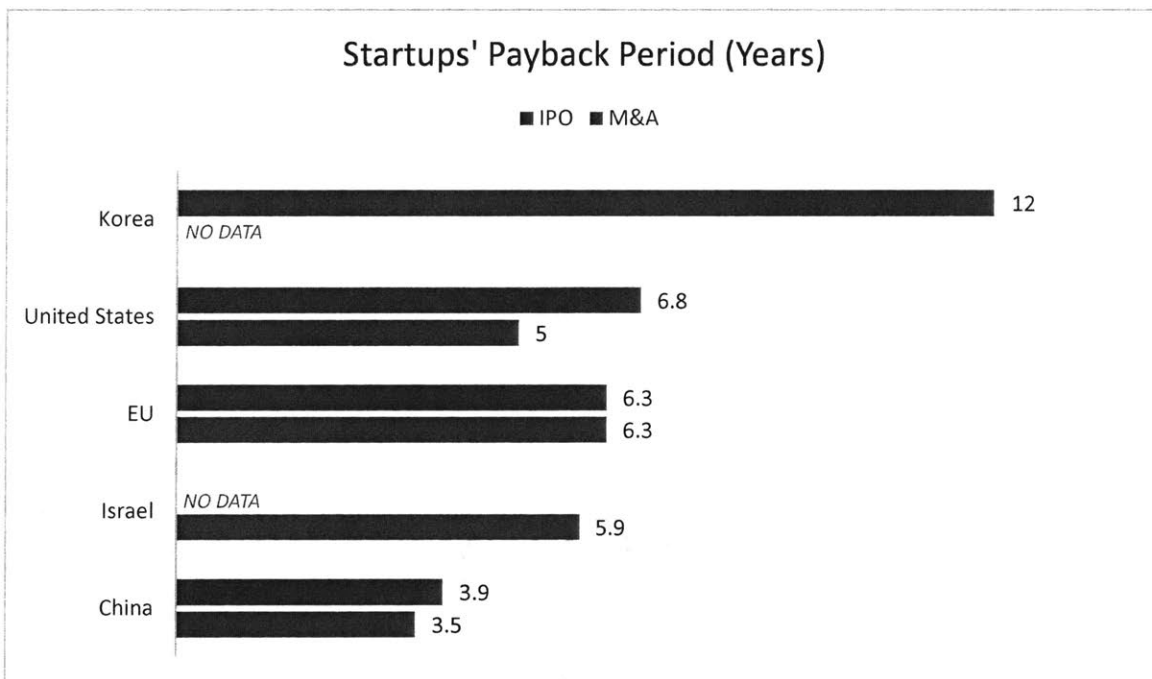
As the overall trades increased between Korea and China, not only well-established companies but also many startups tried to enter the Chinese market. Based on surveys with twenty-five Korean startups, 19 of them answered they are positive about entering the Chinese market or being funded by Chinese firms. Most of the reasons to choose China were due to the large market and capitals in China. Eight respondents (42% of total) answered the large market and five (26%) chose the large capital as the reason why they are interested in entering China. To satisfy the needs of startups, the Korean government also initiated accelerating programs through some organizations such as Korea Trade Investment Promotion Agency (“KOTRA”), Korea Creative Content Agency, Small and Medium Business Administration, Korea International Trade Association, and so on. They provide similar supports, as any other incubators or accelerators, including training, mentoring, and connecting Korean startups and Chinese venture capitals. For example, KOTRA offers consulting services for business development, localization, and legal issues, visits startups to train all levels of personals, hosts business fairs or demo days in China to introduce Korean startups to Chinese investors, and allocates outstanding individuals who understand

the Chinese market to startup companies.

5.3 Causes of Weak Performance

Although many companies with great business models decided to penetrate other countries like the United States, Japan, or China, many Korean startups were not strongly competitive in the global market and failed to scale the business. Especially, the number of startups that failed to enter the Chinese market or closed offices in China is increasing. Then, what is missing in the Korean startup ecosystem?

5.3.1 Low Chance of M&A



While the average time for startups to go public on the stock markets is 6 to 7 years in Silicon Valley, Korean startups take an average of 12 years to offer an IPO (McKinsey&Company, 2015). The Korean startups need a relatively longer time to be ready to go public, so they frequently run out of capital before creating enough revenue to cover the cost. Even worse, according to the survey from McKinsey, entrepreneurs said the

funds from government to start new companies are relatively easy to access because the government provides about \$30,000 to \$70,000 to a new enterprise through its fund programs (McKinsey&Company, 2015). However, in order to keep their growth, the startups often need additional funding, and many of them struggle because there is less government support and less connection to other financial resources including venture capitals. The longer they have to wait for any additional capital, the higher the possibility that the firms run out of money. That is why access to M&A can be one of the solutions to raise funds quicker than waiting to get listed. In the USA as well as Israel, for example, M&A is preferred to IPO for startups to scale the businesses or investors to exit. The M&A as an exit strategy raised the success rate of startups because it normally takes less time to find companies to merge or acquire than to get ready to file an IPO (Korea Venture Capital Association, 2017). While it takes 12 years to go listed on a stock market, it is expected for startups to take only 5 to 7 years to be merged or acquired.

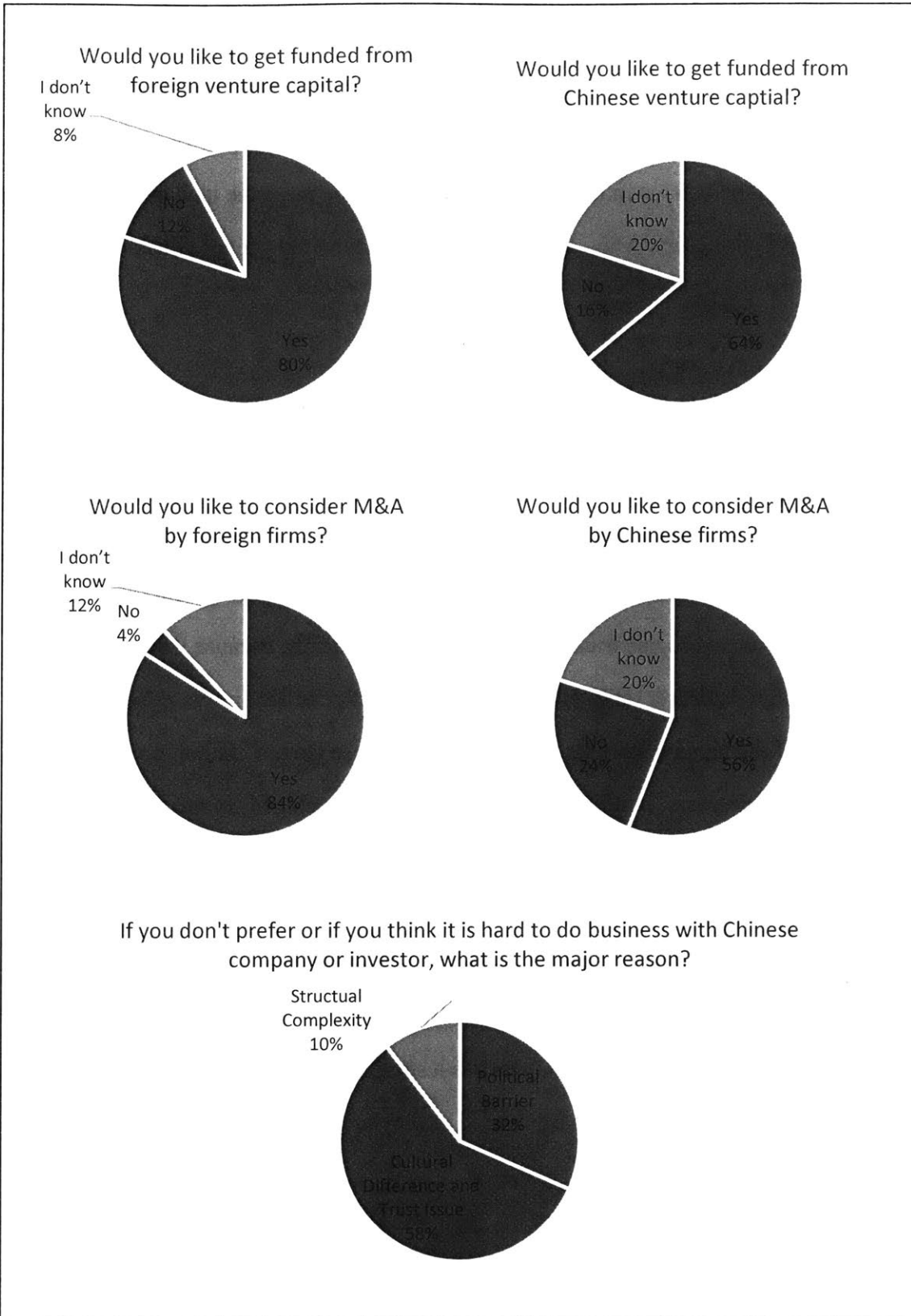


However, the chance of Korean startups to be merged or acquired to scale the business is quite low. One of the reasons is that the large Korean firms, capable to acquire small startups, are in manufacturing or chemical industry while the number of Korean startups in

those industries are small. Many startups are in Internet Technology, bio/healthcare, service, and media/entertainment industries in descending order. In addition, for large Chinese companies, Korean startups are less attractive because it takes a long time and high costs for the startups to globalize or localize to the Chinese market. Lack of supports or experts to connect Korean companies and Chinese firms is one of the main reasons why Korean startups are stuck in the boundary.

5.3.2 Cultural Difference and Lack of Expertise

In addition, the Korean startups failed to enter the Chinese market because of the cultural differences and the lack of understanding about the Chinese market. Some companies may have penetrated into the market successfully, but they often stopped growing or lost market shares due to the difference in culture and business style. According to the survey I conducted with the sample of 25 entrepreneurs, less respondents were positive about investments from Chinese venture capitals or M&As by Chinese firms compared to investments from other foreign countries or M&As by other foreign firms. When asked why they do not prefer to work with or why they think it is hard to do business with Chinese firms or investors, 19 people answered it is because of the political barrier, cultural difference, or structural complexity. More than a half of them chose the cultural difference and trust issues as the reason why it is hard to do business with Chinese firms or investors.



The lack of trust and fear from the cultural difference come from the absence of Korean experts who understand Chinese business and culture. Unlike Israel, which has many people who have done business in the United States or with American companies or who have lived in the U.S. even longer than in Israel, Korea faces the lack of information and knowledge from experts who experienced or understand the Chinese business and culture.

5.3.3 Difficulty in Globalization and Localization

Some Korean startups performed poorly in China because they failed to localize in China. Unfortunately, unlike the United States which creates or uses universal standards, China often has its own unique system and process, which made it harder for foreign companies to localize. For example, in the early 2000s, many Korean gaming companies with high-quality technologies tried to enter the Chinese market because China has a large user base and high paid-user ratio. However, the result of penetration was miserable because most of the gaming startups who had the “Chinese Dream” failed to survive and disappeared in a few years. In other countries, including developed countries and developing countries, all gaming companies uploaded their games in a couple of game channels such as Google Play or Apple Store. On the other hand, China, where Google has been blocked, had more than 100 game channels, so developers had to create 100 different SDKs, software development kits, and eventually got financial pressures. Language is also another obstacle for startups because China has a strong persistence on using only Chinese. Even many brand names, which are often used as they are in other countries, are transformed into Chinese names.

Apple	苹果	Ping-Guo	IKEA	宜家	Yi-Jia
BMW	宝马	Bao-Ma	KFC	肯德基	Ken-De-Ji
Chanel	香奈儿	Xiang-Nai-er	McDonald	麦当劳	Mai-Dang-Lao
Facebook	脸谱网	Lian-Pu-Wang	Microsoft	微软	Wei-Ruan

Hermes

爱马仕

Ai-Ma-Shi

UNIQLO

优衣库

You-Yi-Ku

The uniqueness of the Chinese system was not the only reason why Korean startups struggled in localization, but also because many of them were still not ready to globalize. In the late 1990s, we already started to use the Korean version of Facebook called Cyworld and the Korean version of WhatsApp called Buddy-buddy. As many people use Facebook and WhatsApp nowadays, Cyworld and Buddy-buddy used to be so popular that most Koreans, except people who didn't know how to use a computer, used these platforms. However, the life spans of these two companies were not too long because they didn't scale the business to other markets but only stayed and diminished in the Korean market. If Korean startups started with some elements that make it easy to globalize the business, they could have played in the broader markets and lasted longer.

6. Conclusions

6.1 Lessons from Israel to apply

As Chapters 3 and 4 showed, the funding from the United States was one of the reasons that Israel became a successful “Startup Nation”. U.S. venture capital has more access to introduce Israeli companies to the U.S. market with supportive government policies and market structure, and service from incubators or accelerators in Israel amplified the synergy between Israeli startups and venture capital in the States. If this synergy between Israeli startups and U.S. venture capital companies can be replicated in the relationship between Korean startups and Chinese venture capitals, the Korean startups can be more attractive to the Chinese market. Chinese venture capitals with local connections and local experts can bring several benefits to Korean startups. These benefits include: more access to M&A opportunity, better information and understanding about the Chinese market, and localization support. Venture capitalists often have strong networking skills and connections built in certain industries because their main task is deal sourcing by participating in forums or events with many companies, meeting companies interested in scaling their business, visiting startups, and collecting data about market trends and new businesses. The networks and information collected from different places are their valuable assets. Utilizing the assets by working with Chinese venture capitals, Korean startups can gain more access to M&A opportunity by Chinese firms and understand differences in the market, businesses, and culture in China. In addition, Korean startups can develop business projects initially targeting the global market or Chinese market if they can work with Chinese venture capital in the early stage.

6.2 Limits to Replicability

There are limitations to replicate the successful synergy between Israeli startups and U.S. venture capitals in the relations between Korean startups and venture capitals in China. First, China is one of the countries strongly protecting its own domestic businesses, so Chinese regulation and policy could block Korean companies from entering the market if they think the companies can negatively affect Chinese companies. Facebook and Google show the typical examples of Chinese government's intervention to protect its own companies. Facebook and Google are not accessible in China without special network tools such as Virtual Private Network ("VPN"), which "enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network" (Wikipedia, 2017). In addition, Chinese Foreign Direct Investment after 2006 abolished the tax benefit for foreign companies, tightened the foreign labor regulation and M&A regulation, and complicated the deal screening process (Analyzing Investment Environment in China, 2011). In addition, although it is not legally impossible for a foreign company to be listed on the Chinese stock market, the process and regulation of IPOs in China is too complicated and discriminating for foreign companies, so almost no foreign company has gone public in China. It is almost impossible for Korean startups to go public in China because of the Chinese policy to protect its own companies.

Recently, the more crucial factor that limits the relationship between Korean startups and Chinese venture capital is the political conflict between Korea and China. For example, once there was an announcement that THAAD, the ground-based missile defense system, would be deployed in Korea and operated by U.S. forces stationed there, China became angry as it considers the THAAD system as a threat to Chinese military operations. A few days after the announcement was made in spite of China's opposition, "state media outlets have published strong commentary condemning the move, warning that Lotte [which

offered the place to deploy the system] should be pushed out of the country, and even calling for Chinese consumers to boycott Korean brands from Samsung to Hyundai” (YanSophia, 2017). One of my colleagues working in a private equity fund in China told me that most M&A deals between Korea and China that he was directing were dropped, and many contracts especially in media and tourism industry have been terminated. The stability of the political relationship between Korea and China affects the stability of business relationships and opportunities of Korean startups in the Chinese market. While many Israeli have lived in the United States even after the nation of Israel was formed, the number of influential Koreans in China is relatively small. Therefore, when political issues attack businesses between Korea and China, the damage to Korean companies, especially small startups, is unpredictable because there is not much of a powerful community to support them.

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Appendix

Active Israeli Companies on the NASDAQ Stock Market

Symbol	Name	Last Sale	Market Cap	Sector	IPO year	U.S. Funding
ABIL	Ability Inc.	1.769	45562615.2	Finance	2014	Yes
ADHD	Alcobra Ltd.	1.12	30868230.4	Health Care	2013	No
ALLT	Allot Communications Ltd.	4.74	156962161.2	Technology	2006	Yes
APOP	Collect Biotechnology Ltd.	8.6783	46682085.72	n/a	1992	Yes
ATTU	Attunity Ltd.	7.79	131381177.8	Technology	1999	No
AUDC	AudioCodes Ltd.	6.84	221693264.6	Public Utilities	n/a	No
BCOM	B Communications Ltd.	20.1601	602566136.1	Consumer Services	1996	Yes
BLRX	BioLineRx Ltd.	0.87	53750717.58	Health Care	2014	No
BOSC	B.O.S. Better Online Solutions	1.98	5950034.64	Technology	2007	Yes
BVXV	BiondVax Pharmaceuticals Ltd.	7.09	23946007.06	Health Care	2015	No
CALL	magicJack VocalTec Ltd	8.45	135628305.2	Public Utilities	2012	No
CAMT	Camtek Ltd.	3.82	135030032.3	Capital Goods	2000	No
CANF	Can-Fite Biopharma Ltd	1.882	30780015.9	Health Care	2005	Yes
CEL	Cellcom Israel, Ltd.	10.33	1039245291	Public Utilities	2007	Yes
CGEN	Compugen Ltd.	4.1	209639289.4	Health Care	2016	No
CHEK	Check-Cap Ltd.	2.1756	33721800	Health Care	2000	Yes
CHKP	Check Point Software Technologies Ltd.	103.16	18042841113	Technology	1996	Yes
CRNT	Ceragon Networks Ltd.	3.17	246260362.7	Technology	2015	Yes
CSTE	Caesarstone Ltd.	35.95	1233860549	Capital Goods	2000	No
CYBR	CyberArk Software Ltd.	52.16	1795515207	Technology	2014	Yes
DRIO	DarioHealth Corp.	2.86	22812850.06	Health Care	2013	No
ELLO	Ellomay Capital Ltd.	8	85418960	Public Utilities	1996	Yes
ELOS	Syneron Medical Ltd.	11.2	392206348.8	Health Care	n/a	Yes
ELTK	Eltek Ltd.	0.64	6491367.68	Technology	n/a	Yes
EMITF	Elbit Imaging Ltd.	3.42	31432563.36	Consumer Services	1997	No
ENZY	Enzymotec Ltd.	8.025	184132597.8	Consumer Durables	2013	No
ESLT	Elbit Systems Ltd.	117.08	5004922259	Capital Goods	2007	No
EVGN	Evogene Ltd.	5.24	133409399.2	Basic Industries	2014	Yes
FOMX	Foamix Pharmaceuticals Ltd.	4.44	165119066.8	Consumer Durables	1991	No
FORTY	Formula Systems (1985) Ltd.	39.73	585174508.9	Technology	1997	No
GILT	Gilat Satellite Networks Ltd.	5.43	296753664.8	Technology	2014	No
GLMD	Galmed Pharmaceuticals Ltd.	4.75	57708823.5	Health Care	2011	No

Bibliography, Appendix, and Acknowledgements

GZT	Gazit-Globe Ltd.	10.36	2036396006	Finance	1993	Yes
ICL	Israel Chemicals Shs	4.3	5488476600	Basic Industries	1997	Yes
IGLD	Internet Gold Golden Lines Ltd.	10.75	206434249.5	Public Utilities	2015	No
ITRN	Ituran Location and Control Ltd.	31.35	735954761.9	Consumer Non-Durables	1999	
KMDA	Kamada Ltd.	7.1	258782092.2	Health Care	2014	Yes
KRNT	Kornit Digital Ltd.	19.25	644739537.8	Capital Goods	2005	No
KTOV	Kitov Pharmaceuticals Holdings Ltd.	2.0342	15585753.58	Health Care	2013	Yes
MAGS	Magal Security Systems Ltd.	7.28	166871053.4	Consumer Durables	2015	
MBLY	Mobileye N.V.	61.74	13708997733	Technology	2015	Yes
MBOT	Microbot Medical Inc.	5	136256665	Health Care	1993	No
MDGS	Medigus Ltd.	3.14	2772170.98	Health Care	1991	Yes
MDSY	ModSys International Ltd.	0.82	15650650.38	Technology	n/a	Yes
MDWD	MediWound Ltd.	6.45	141451396.1	Consumer Durables	2013	Yes
MGIC	Magic Software Enterprises Ltd.	8.15	361397243	Technology	n/a	Yes
MNDO	MIND C.T.I. Ltd.	2.41	46352537.38	Technology	2014	No
MTSL	MER Telemanagement Solutions Ltd.	0.66	5777743.62	Public Utilities	1997	Yes
MYSZ	My Size, Inc.	2.27	39964164.93	Technology	n/a	Yes
MZOR	Mazor Robotics Ltd.	27.82	591379449.2	Health Care	2000	Yes
NDRM	NeuroDerm Ltd.	26.15	688742308.7	Health Care	2014	Yes
NICE	NICE Ltd	67.83	4066027974	Technology	1997	Yes
NNDM	Nano Dimension Ltd.	6.85	68142745.1	Technology	n/a	No
NSPR	InspireMD, Inc.	0.7	1030824.2	Health Care	n/a	
NTEC	Intec Pharma Ltd.	5.4	61820231.4	Health Care	2014	Yes
NVMI	Nova Measuring Instruments Ltd.	18.15	498955097.9	Capital Goods	n/a	No
OBAS	Optibase Ltd.	8.8	45885452.8	Finance	2000	Yes
ORBK	Orbotech Ltd.	31.17	1491032722	Capital Goods	n/a	No
ORMP	Oramed Pharmaceuticals Inc.	6.35	84349285.2	Health Care	1999	Yes
ORPN	Bioblast Pharma Ltd.	0.55	9015473.5	Health Care	2006	No
OTIV	On Track Innovations Ltd	1.59	65316207.84	Technology	n/a	Yes
PERI	Perion Network Ltd	1.96	151998135.2	Technology	1999	Yes
PLX	Protalix BioTherapeutics, Inc.	1.22	151443583.7	Health Care	20016	Yes
PNTR	Pointer Telocation Ltd.	9.15	71423472.6	Technology	2011	No
PSTI	Pluristem Therapeutics, Inc.	1.47	141372648.9	Health Care	1997	No
PTNR	Partner Communications Company Ltd.	5.371	843211213	Public Utilities	2006	Yes
RADA	RADA Electronic Industries Ltd.	1.155	25154071.64	Consumer Non-Durables	n/a	
RDCM	Radcom Ltd.	19.1	222928706	Technology	1997	Yes
RDHL	Redhill Biopharma Ltd.	9.75	166317050.3	Health Care	1999	No
RDWR	Radware Ltd.	15.83	699225347	Miscellaneous	n/a	Yes

Bibliography, Appendix, and Acknowledgements

ROSG	Rosetta Genomics Ltd.	2.71	5062605.2	Health Care	2014	Yes
RWLK	ReWalk Robotics Ltd	1.95	31884467.55	Health Care	2007	Yes
SEDG	SolarEdge Technologies, Inc.	15.65	649093233.9	Technology	n/a	Yes
SILC	Silicom Ltd	46.51	343318820.6	Technology	2010	Yes
SODA	SodaStream International Ltd.	50.06	1086194922	Consumer Durables	2015	Yes
SPCB	SuperCom, Ltd.	2.91	43709669.55	Technology	2015	Yes
STDY	SteadyMed Ltd.	6.95	139971790.7	Health Care	n/a	Yes
TARO	Taro Pharmaceutical Industries Ltd.	117.02	4801585001	Health Care	2004	Yes
TATT	TAT Technologies Ltd.	9.85	86960173.4	Capital Goods	1961	Yes
TEVA	Teva Pharmaceutical Industries Limited	32.31	32794336787	Health Care	n/a	No
TISA	Top Image Systems, Ltd.	1.35	24190820.1	Technology	1951	Yes
TRPX	Therapix Biosciences Ltd.	7.44	6584243.76	Health Care	2016	No
TSEM	Tower Semiconductor Ltd.	22.34	1929215380	Technology	1996	Yes
VBIV	VBI Vaccines, Inc.	5.36	213873953.5	Health Care	1994	Yes
VBLT	Vascular Biogenics Ltd.	5.4	145272339	Health Care	2014	Yes
WILC	G. Willi-Food International, Ltd.	5.97	79048250.61	Consumer Non-Durables	n/a	Yes
WIX	Wix.com Ltd.	76.3	3421241795	Technology	2013	Yes
XTLB	XTL Biopharmaceuticals Ltd.	2.37	12186675.09	Health Care	2005	No

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