

Israel National Technological Innovation Report 2016 – 2017

Intellectual property, high-tech
and economic-technological development in Israel
Status report and future challenges



Prepared by
The Luzzatto Group Research Division
November 2016



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Preface

For more than a decade, the Luzzatto Group has published national reports on intellectual property, high-tech and technological innovation. Since new technologies pass through the world of intellectual property before they reach the market, our industry enjoys special insight regarding the state of technological innovation in Israel. We present our findings and recommendations in this report as part of our ongoing commitment to corporate responsibility, one of the founding tenets on which our firm is built.

The updated and expanded edition of the 2015-2016 National Technological Innovation Report is comprised of three main sections on intellectual property, high-tech, and economic-technological development in Israel.

This report contains data from numerous sources, including the IVC Research Center, the IMD Research Institute's annual report, the World Intellectual Property Organization's (WIPO) annual report, and data from the Israeli Patent Office, economic consultants from Hisunim Financim, the Wall Street Journal, The Economist, and Israel's Central Bureau of Statistics.

The facts and figures compiled here paint a mixed picture. On the one hand, the Israeli high-tech industry shows demonstrable strengths: 2014-2015 were very good years, with record numbers in capital recruitment and exits, and preliminary data for 2016 indicate that this trend is likely to continue unabated.

However, there are complex challenges on the horizon, among them a serious shortage of engineers capable of producing the next generation of entrepreneurs and inventors and a dramatic rise in the salaries of high-tech employees (which presents a barrier to cash-strapped, early-stage startups seeking their services). Another notable obstacle is the decline in national R&D expenditure, while Israel's competitors are increasing their investment in this field. The cracks are already making themselves felt: the volume of international patent applications (PCT) originating in Israel is shrinking—and while this trend is not new—it should arouse deep concern, in light of the fact that intellectual property is a harbinger of technological innovation.

Conceptual breakthrough

Since our previous report, intellectual property has again shown that it has a critical role to play in the global information economy. A significant example can be found in the U.S. government's decision to change the method for calculating the size of the national economy to include indices such as innovation, R&D and various kinds of intellectual property (updates to GDP measurement only occur once every five years, and amendments to it are not undertaken lightly). America's newly-calibrated GDP reflects the transition to a knowledge-based economy that must assimilate the value of intangible intellectual assets to understand its full worth. The change, it should be noted, is slated to add 3% to the U.S. economy.

In Israel, too, the subject of intellectual property has taken on macroeconomic importance. The Ministry of Finance has recognized that intellectual property is already the source of billions of dollars in taxable, annual profits from multinational companies operating in the country. As a result, the Ministry of Finance is pioneering a set of far-reaching benefits aimed at incentivizing multinationals to keep to intellectual property in Israel and to pay tax on it locally.

Over the past few years, Israel has made important improvements to its intellectual property regime as well as to the quality of operations in the Israel Patent Office. Nevertheless, enforcement is sorely lacking. Copyright violations in software, drugs, music and more highlight this glaring lacuna.

For Israel, whose relative advantage relies on human capital, and which presents a technologically innovative economy, intellectual property is a strategic national resource. Consequently, developing, maintaining and leveraging it may be deemed a clear-cut Israeli interest. In the same way, creating an environment favoring innovation, both for local inventors and researchers, as well as for multinational companies—which build development centers in Israel—can be seen as a real, existential need.

The Israeli government can learn from the experience of technology powerhouses such as the U.S. and Japan, whose president and prime minister set up special task forces to promote intellectual property matters, recognizing the vital importance and contribution of intangible intellectual assets to their economic growth.

It is my hope that this comprehensive report, prepared by the Research Department of the Luzzatto Group, will assist decision-makers to focus their efforts on technological innovation and intellectual property, which can be mined for significant growth opportunities for the Israeli economy as whole.

My thanks to those who compiled this report, among them Advs. **Amir Palmery, Niv Moran** and **Michal Luzzatto**, Patent Attorney **Boaz Croitoro**, editor-in-chief **Joel Tsafrir**, and many others. I congratulate all of them on a job well done.

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Introduction

Intellectual property is considered the most important resource in the possession of corporations, companies and countries. This resource is not only a reflection of technological innovation, but also of the core economic activity of developed, post-industrial countries that rely on intangible intellectual assets (patents, trademarks, models, know-how, goodwill, customer loyalty, etc.).

Various studies have shown that in developed countries, intellectual property plays a decisive role in generating national wealth. In these countries, product from intellectual property amounts to \$354,000 per capita, compared to \$76,000 per capita from manufacturing and just \$9,500 per capita from natural resources. In other words, the pace of technological development has transformed the relative edge based on intellectual property into a key component of the economy.

The accelerated pace of technological development changes the rules of the game across the board, impacting everything from the economy to interpersonal relationships. In all new technologies - from the Internet of Things to robotics, the cloud to cyber and fin-tech, self-driving cars, the smart home and even smarter cities - intellectual property has a critical role to play. The promise of patent protection fosters initiative, research and development, and commercialization of these and other intellectual assets

The intellectual property system in Israel

Israel has become a focal point of global innovation in many fields and consequently is particularly sensitive to the changes and developments in the world of intellectual property. Israel must prioritize the preservation and creation of native intellectual property, which is, after all, the product of one of the country's other most valuable assets—its human capital.

In recent years, Israel has successfully narrowed the gap between the anachronisms in its own intellectual property system and the more advanced legislative infrastructure of developed countries. During this time, Israel adapted its work environment on the bureaucratic-regulatory-legal front to meet world standards relating to intellectual property, both in regard to the enforcement of intellectual property and copyright and its work processes. Today, we can confidently state that Israel's domestic law is fully aligned with international intellectual property law.

This standardization process was a prerequisite to Israel's admission to various international treaties, most notably its acceptance into the Organization for Economic Cooperation and Development (OECD). While this process is still in motion, the end goal is in sight—broader protection and enforcement of the intellectual property rights of inventors and developers of technological innovation.

What is still lacking, in the opinion of the authors of this report, is a pro-active, aggressive approach to the protection of intellectual property assets.

On this last point, we can learn from the experience of others. As mentioned in the preface, the leading economies of the western world, such as the U.S. and Japan, have already adopted reforms aimed at minimizing the bureaucratic obstacles on the road to leveraging intellectual property assets—reforms pioneered by heads of state themselves no less! In the U.S., the president set up a task force to review the subject of intellectual property, and in

Japan, the matter fell under the direct responsibility of the prime minister. The European Union and its member states also deemed it worthwhile to dedicate serious thought to the enforcement of intellectual property rights, and a directive instructing EU members how to promote enforcement was published over a decade ago in 2004.

Nor has the importance of intellectual property escaped the attention of developing countries. China, for example, known for years as a counterfeiters' paradise, has introduced steps to stem the phenomenon and created an intellectual property system that will enable outside investors to transfer technology without fear of copying or counterfeiting. Still, China's burgeoning economy has a long way to go where piracy and counterfeiting are concerned; these twin menaces result in heavy financial losses for multinational companies and countries that export to China.

Active leveraging of intellectual property assets

With the standardization of our legal infrastructure nearing completion, the next logical step for Israel is to actively leverage the intellectual property assets in possession of the State. Some of the key recommendations of this report center on the establishment of a national committee dedicated to creating a comprehensive policy on the protection of intellectual property rights alongside the active promotion of the untapped intangible assets in universities, hospitals, the defense industry and elsewhere. At a later stage, Israel should consider establishing a government authority, subordinate to the Ministries of Economy and Industry or Justice, charged with building a multi-disciplinary, inter-office policy for intellectual property.

This report is intended to provide a current overview of how intellectual property issues are handled nationally, the key changes implemented over the past few years, as well as a survey of the issues still in need of attention on the road to closing the gaps between Israel's infrastructure and the accepted standards in the developed world. Additionally, this report will also address the potential in the intellectual property assets found in the government-public sector.

We believe that caring for Israel's intellectual property is a national priority of the highest order

Israel, as a leading technological and scientific innovator that exports knowledge and technology in giant deals to leading international companies and developing countries alike, must give intellectual property the attention it merits on the national agenda. Proper handling of intellectual assets emanating from business and the public sector serves as a growth engine for a contemporary economy resulting in increased income for the State, additional jobs, strengthening of the State's foreign relations and international reputation, and prevention of a brain drain of Israel's intellectual talent.



CHAPTER 1

On economics, technological innovation and what lies between

The affinity between macroeconomic
performance in Israel and technological
innovation

Economic performance and technological innovation are two sides of the same coin. In today's information economy, technological innovation commands a considerable share of domestic products. Successful innovation hinges, amongst other factors, on a country's investment in research and development infrastructure, fostering qualified human resources, advancing financial and venture capital ecosystems, and more. In this symbiotic relationship, technological innovation exerts considerable influence on macroeconomics, a fact supported by global intellectual property data which show a clear correlation between economic growth and the increasing numbers of patents registered in a particular country, and vice versa (more on this in the following chapters). In this regard, intellectual property data serve as a first indicator of economic performance in the various countries.

The situation in Israel

In Israel, the interconnectedness of the economy and the technological sector holds special significance as the Israeli economy is both technology-oriented and export-oriented, with about half of total export consisting of technological products and services.

Perhaps more than anywhere else in the world except China, there is a direct correlation between economic growth and technological innovation, as we will discuss in detail in this report.

General background: Continuous growth over three decades

Over the past three decades, Israel has experienced an economic turnaround unprecedented in character and scope. The change began in the early 80's as a closed, concentrated economy with a large public sector and burdensome tax regime, to an open and competitive economy that attracts foreign investments and participates in global financial markets. Simultaneously, Israel shifted its economic center of gravity from labor-intensive industrial production to a knowledge-based economy focused on the development of technological innovation, the precursor to the now-booming high-tech industry in the fields of life sciences, communications, software, the Internet and cyber.

The combination of tireless entrepreneurship, groundbreaking inventiveness, an impressive ability to raise capital, and a powerful drive to succeed—all these have made Israel a desirable business destination for multinational corporations, which have established development centers that play a vital role in the perpetuation of an Israeli culture of innovation.

Over the past three decades, Israel has experienced an economic turnaround unprecedented in character and scope. The change began in the early 80's as a closed, concentrated economy with a large public sector and burdensome tax regime, to an open and competitive economy that attracts foreign investments and participates in global financial markets. Simultaneously, Israel shifted its economic center of gravity from labor-intensive industrial production to a knowledge-based economy focused on the development of technological innovation, the pre-cursor to the now-booming high-tech industry in the fields of life sciences, communications, software, the Internet and cyber

Dramatic economic uptake

A review of the long-term economic trends in 2015 reveals that Israel dramatically improved its performance during the years 1984 -2014 in a series of important economic indices and business parameters. For example, Israel doubled its population in that period (from 4.1 million to 8.2 million), increased product by 920%, product per capita by 414%, foreign currency reserves by 2,866%, while at the same time reducing government debt (as a percentage of product) by 76%. The government deficit as a percentage of product also decreased in



this period, from 17% in 1984 to 3% in 2014. Security expenditure as a percentage of product also fell by 75%, government deficit by 82%, the tax burden by 30%, and American aid (as a percentage of product) by 90%. These are unprecedented achievements when compared with other western countries and with Israel's fellow OECD members.

The dramatic changes presented in the birds-eye view above find other corroborating statistics from the government sector. The weight of the government sector in the national economy decreased over the past three decades by 42% (from 75% in 1984 to 43% in 2014), inflation plummeted from 450% to 1% (a decrease of 99%), the annual banking interest rate also went down by 99% (from 770% to 5%), and government control of the capital market lessened by 68%. All these are the fruits of the 1985 economic stabilization plan, which put Israel on track for growth, low inflation and declining deficit.

The jump in Israeli gross national product since the beginning of the century has been nothing less than astounding—from 500 billion shekels to more than one trillion. In 2000, Bank of Israel projections for 2015 were only 750 billion shekels. Israel owes this impressive growth at least in part to the achievements of the technology industry which saw a long line of successful exits and invited a stream of foreign investments.

Furthermore, total export increased in the past thirty years by 860%, with high-tech export rising by a fantastical 3,700%. During this time, Israel also succeeded in developing energy from independent sources and attaining 38% of its total energy within Israel's borders (compared with 0% in 1984), thereby moving the country closer to energy independence. Israel's achievements in water technology were also impressive, with desalination after three decades reaching 41% of the country's total water resources.

Israel made notable headway in the educational sphere as well—and these achievements, too, are closely aligned with the progress of technological development. The number of university and college students increased by 378%, and national expenditure for R&D, as a percentage of product, rose by 225%.

Given this situation, the British weekly, The Economist, determined in 2015 that "Since joining the OECD in 2010, Israel is demonstrating better performance in many areas than this wealthy nations club". Warren Buffet, the legendary investor, noted that "Israel has an exceptional quantity of sharp brains and energy". These flattering words from preeminent sources correspond to an important data point: Israel is ranked 19th in the world on the UN's human development index (HDI), ahead of countries such as Belgium, Austria, France and Finland. The HDI is an aggregate of life expectancy, education and income and is a widely accepted standard for measuring the general well-being of a country's inhabitants. Little wonder, then, that Israel is one of the world's happiest populations overall. The happiness index survey found that Israelis are happier than most of the western world: 6th place in the OECD and 11th out of 156 countries.

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Israel: strength in the wake of the 2008 crisis

Analysis of the economic data indicates that in the past five years, Israel's cumulative growth reached 21% - the second highest in all 34 OECD countries. While not wholly unscathed, Israel emerged better from the crisis of 2008 than every other country in the OECD in all quantifiable parameters: debt-product ratio, budget deficit, deficit in the balance of payments, per capita

product growth, and others.

Furthermore, the flexibility of Israeli export—consisting mostly of thousands of companies that specialize in niche areas—and the sectorial and sub-sectorial distribution, mean that the economy is better able to cope with global slowdown. The export-product ratio is one of the highest in the Western world (more than 30% of product), and in contrast to many other countries, is not based on commodities that may wax and wane to a country's economic peril. Here, as in other areas of the Israeli economy, high-tech and entrepreneurship are central assets.

Israeli high-tech: technological innovation and global breakthrough

All these factors influence the high-tech industry, and to the same extent, reflect it. To point to just one such instance, in 2015 there were 86 Israeli companies trading on NASDAQ, more than any other country except the U.S. and China. For more than 300 leading multinationals companies, Israel is the destination of choice for R&D centers, and the Wall Street Journal—arguably the most important financial newspaper in the world—determined in 2015 that Tel Aviv-Yafo is in third place out of the 12 most important international cities in the high-tech world, after Austin and San Francisco and before New York, Stockholm, London, Singapore and others. The Wall Street Journal also reports another stand-out fact declaring Israel to be the second most highly educated nation in the world (Canada and Japan are first and third, respectively).

All this led Deloitte audit and consulting firm, one of the big four CPA firms, to rank Israel fourth in its ability to attract foreign investors. In a global evaluation, Israel comes in fifth for the number of patents per capita, and proportionally, leads the world in the number of employees in research and development—140 per 10,000 (the U.S. comes in second with 85 per 10,000). Israel also produces more scientific papers per capita than any other country, and is one of only eight countries capable of launching satellites into space.

According to data from IMD (for 2015), which takes the temperature in various markets around the world, Israel leads in all the essential parameters required to maintain a strong innovation economy: technological and scientific infrastructure, a sophisticated capital market, flexibility, openness to globalization, a developed venture capital eco-system, skilled workforce, a robust business sector, and extensive scientific research.

The same research ranks Israel first out of 148 countries in innovative ability, second in entrepreneurship and third in global innovation.

In this report, the most significant common denominator shared by successful innovation economies is the way they develop their competitiveness on their route to sustainable growth. Today, the extent of that competitiveness is perhaps one of the more important components in an age of global competition for foreign investment.

The following macroeconomic factors are reviewed in this report: government efficiency (measured against 71 criteria), the efficiency of the business sector (71 criteria), infrastructure (116 criteria), and economic performance (84 criteria).

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Strong technological infrastructures

The latest IMD report shows that Israel improved its overall economic competitiveness in 2015, rising to 21st place (from 24th in 2014), out of 61 countries that participate in the research. But this is a general analysis, and the strengths and weaknesses of the Israeli economy should be reviewed according to more specific criteria which this report will examine in greater detail.

When the same measurement standards are applied to European countries, the Middle East and Africa, Israel finishes in 13th place. Compared with countries whose populations are less than 20 million, Israel comes in at 14th place, which is relatively high.

Israel's strengths are apparent in technological infrastructures (4th in the world—a considerable improvement over 12th place in 2014), scientific infrastructure (mainly high-tech), the ability of venture capital funds to raise money, entrepreneurship, percentage of R&D expenditure relative to GNP, technological innovation, technology sharing, scientific research, academic-business cooperation, and others. In all these parameters, Israel appears in one of the first four places.

Gaps in industry and education

Nevertheless, this report will uncover a noticeable gap between Israel's scientific-technological-research capabilities, in which it tops the rankings, and its abilities in other spheres such as civilian infrastructure, productivity and cost of living, where we occupy low positions. In infrastructure, for example, Israel is in 48th place, near the bottom of the table. Education and health earn reasonable rankings, but for cost of living, Israel is almost the bottom of the barrel coming in 44th.

These differences manifest in other areas as well: Israel has an average ranking for economic performance (26), employment (22) and foreign investments (28), but low rankings in international trade (42). For overall economic performance, Israel's ranking has fallen slightly, from 29th to 30th.

In the analysis of the government sector efficiency, too, Israel's results pale in comparison to its technological achievements. Public financing ranks at a lowly 36. Business sector efficiency does better, with the exception of productivity. The business sector's practical and value-oriented approach to competition wins a high ranking (11) on the global competitiveness table. However, there is a persistent gap between the competitive tendencies of the government sector (24) and that of the business sector (21).

The areas in which Israel improved compared to the previous year are long-term employment, currency exchange rates, immigration laws and number of patents. The areas in which our position worsened are long-term interest rates, exchange rate stability, direct foreign investments, increase in per capita GDP, and corruption.

In summary, Israel's main challenges are to ensure sustainable growth, reduce the bureaucratic weight on the business sector, improve its physical and social infrastructures (first and foremost—education) with emphasis on the periphery, incentivize small and medium-size businesses—again, with emphasis on the periphery, to increase participation in the labor market, and narrow the yawning economic gaps.

Dealing with disparity

The obvious conclusion that emerges from the data is that Israel cannot afford to rest on its technological laurels—it must confront its own shortcomings. The place to start is right here: Israel must address the disparities between the center and the periphery. Next, Israel should set out to tackle the glaring inequality between the strength of the technological sector and the weakness of the social sphere, business sector and government.

Israel should also—or rather, it must also—consider how to narrow the gaps with the world at large. If we compare Israel to Ireland, for example, one of our most prominent rivals for foreign investments in technology, we see that Ireland is ranked higher than Israel in a number of critical areas: Ireland is in fourth place for attracting foreign investments, while Israel is more than 20 spots down the list, lagging behind in 28th place. The Irish business climate is also ranked fourth; Israel's business climate is 26th. Again, a worrying difference. The most shocking gap is in the field of productivity—Ireland is in first place while Israel comes in 32nd place.

Despite an overall positive trend, Israel cannot afford to rest on its technological laurels – it must catch the rest of the country up. The place to start is right here: Israel must address the disparities between the center and the periphery. Next, Israel should set out to tackle the glaring inequality between the strength of the technological sector and the weakness of the social sphere, business sector and government. Third, Israel must invest in closing the gap between itself and international business community



Israel's economic performance – Comparison of 1984 with 2014

Strengths

Economic Performance	
Resilience of the economy	7
Adjusted consumer price inflation (absolute values)	8
Diversification of the economy	10
Long-term unemployment	13
Youth unemployment	15
GDP per capita	23
Government Efficiency	
Investment incentives	4
Central bank policy	5
Aging of society	10
Labor regulations	14
Cost of capital	15
Pension funding	15
Business Efficiency	
Venture capital	2
Flexibility and adaptability	3
Entrepreneurship	4
Attitudes towards globalization	6
Skilled workforce	8
Finance skills	10
International experience	13
Infrastructure	
Business expenditure on R&D (%)	1
Total expenditure on R&D (%)	1
Cyber security	1
Innovative capacity	1
Funding for technological development	1
Development and application of technology	1
Tech partnerships	1
Scientific research	2
Scientific research legislation	2

Weaknesses

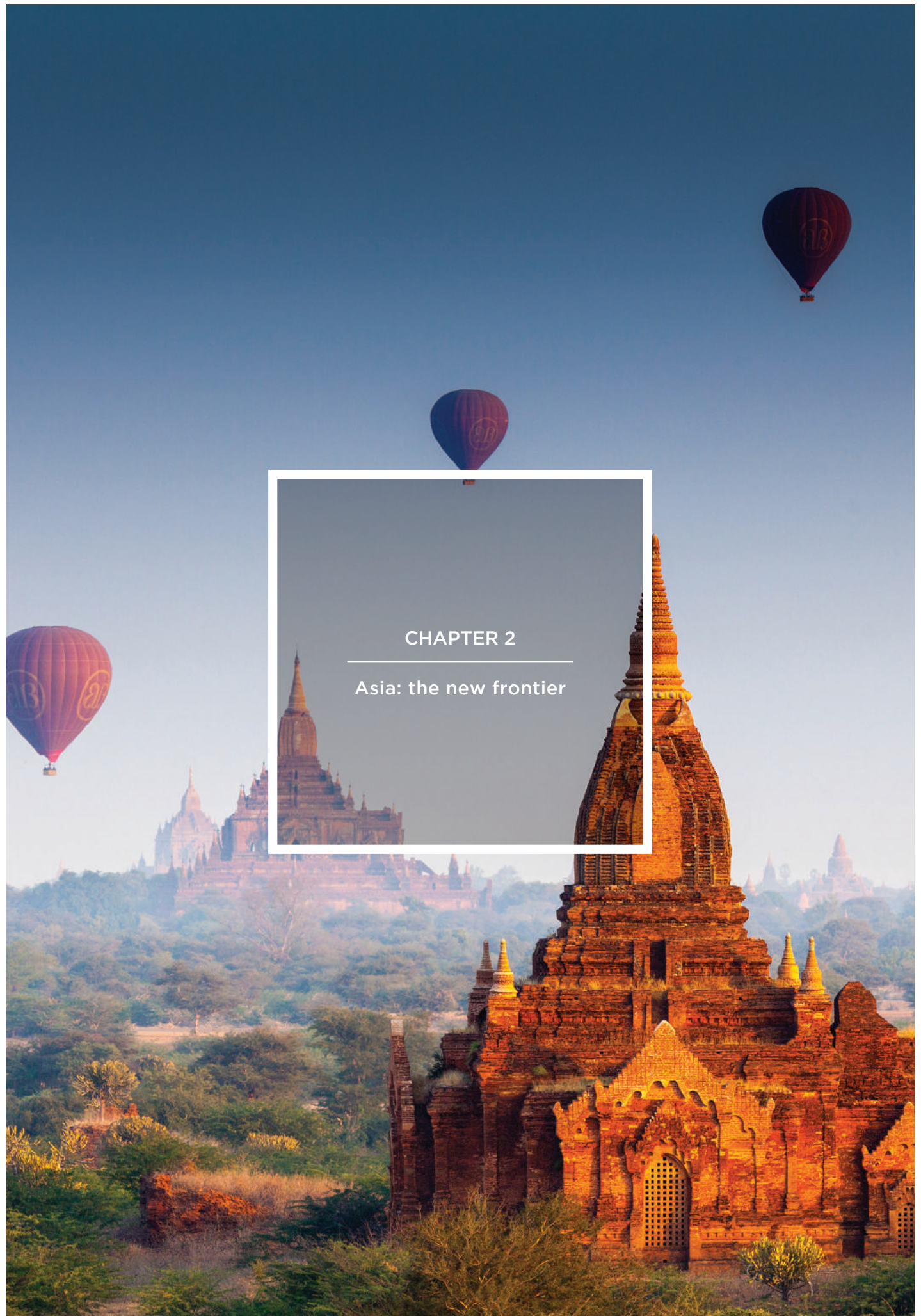
Economic Performance	
Cost-of-living index	51
Gasoline prices	48
Export concentration by product	48
(%) Direct investments stocks inward	44
Real GDP growth per capita	23
Long-term unemployment	13
Government Efficiency	
Redundancy costs	52
Immigration laws	44
(Gini coefficient (social equality	41
Total general government debt (%)	41
Corporate tax rate on profit	40
Collected total tax revenue	37
Business Efficiency	
Corporate boards	48
(%) Labor force	46
Large corporations	40
Image abroad or branding	38
Employee training	36
Social responsibility	34
Infrastructure	
Fixed broadband tariffs	50
Public expenditure on education per pupil ((secondary	47
Mobile telephone costs	45
Total health expenditure	32
Internet bandwidth speed	30
Women with degrees	30
Mobile telephone subscribers	29
Electricity costs for industrial clients	27
Scientific research	2
Scientific research legislation	2

Source: IMD World Competitiveness Yearbook 2015

Israel's economic performance – Comparison of 1984 with 2014

Item	1984	2014	Change in %
Defense industry spending	20%	5%	-75%
Tax burden	45%	32%	-30%
American aid as a percentage of product	10%	1%	-90%
Total export (in billions of dollars)	10	96	860%
Hi-tech export (in billions of dollars)	1	38	3,700%
Government debt as a percentage of product	17%	3%	-82%
Energy from independent sources (energy independence)	0%	38%	n/a
Water from desalinated sources (from total water usage)	05	41%	n/a
Women's employment	34%	54%	59%
Number of students (ten thousand)	64	306	378%
Weight of the government sector in the overall economy	75%	43%	-42%
National R&D spending as a percentage of product	1.3%	4.2%	223%
Government control of the stock market (weight of government stock relative to total bonds)	85%	27%	-68%
Annual interest rate	770%	55	-99%
Annual inflation	450%	1%	-99%

Source: Hisunin Financim Inc., 2015



CHAPTER 2

Asia: the new frontier

The shift of global economic power towards East Asia demands Israel's renewed attention in light of the fact that our two main trade blocs – the U.S. and the European Union – have been suffering from a significant slowdown. Asian countries are willingly picking up the slack and eager to acquire technology and know-how from Israel.

In recent decades, there has been a growing recognition of the fact that the focus of the global economy is shifting gradually eastward and that the Asian continent is occupying, and will continue to occupy in the future, a dominant place in the world economy to the detriment of American and European economies. The ascendancy of Asian markets constitutes a dramatic change in the distribution of global power. China is already ranked the second largest economy in the world, and one forecast predicts that it will overtake the U.S. by 2030.

We can also learn about the power of the Asian countries (led by China) from studying global intellectual property data. As explained later in this report, intellectual property is both a reflection of a country's economic performance and a reliable indicator of future performance.

In 2014, China recorded a record number of international patent applications – close to 800,000, four times more than the U.S. In practice, China was responsible for over 89% of the global growth in international patent application numbers in 2013-2014. Other Asian countries, such as Thailand, Singapore and Indonesia, also had a hand in this as well. Almost 60% of all international patent applications in 2014 came from Asian countries, compared with 50% in 2004. During that decade, Europe saw a decline of 8% in patent applications, and North America, a smaller decline of 2%, reverberations of the global financial crisis whose secondary tremors are still being felt in western European countries.

China's transition to an innovation economy is particularly impressive owing to the fact that it lagged behind western countries in matters of economic and technological development for so long. In the 1980s, it had barely registered a single patent, and starting in the 1990s it gradually entered the world's intellectual property market. From the 2000s onwards, the country witnessed steep incline. This change reflects, among other things, China's huge investments in R&D.

In 2014, China recorded a record number of international patent applications – close to 800,000, four times more than the U.S. In practice, China was responsible for over 89% of the global growth in international patent application numbers in 2013-2014. Other Asian countries, such as Thailand, Singapore and Indonesia, also had a hand in this as well. Almost 60% of all international patent applications in 2014 came from Asian countries, compared with 50% in 2004

A shift in the Israeli mindset

The migration of economic power to East Asia necessitates a reevaluation of the commercial map as Israel's traditional trade blocks, the U.S. and Europe, take a backseat.

For the past ten years, Israel has been working to assimilate this new reality, all the while increasing the volume of trade with Asia – and the potential is far from exhausted. As the Western markets struggle to shake off the remnants of the 2008 crisis, the need to find alternative markets, primarily in Asia, becomes a matter of economic survival.

It is astonishing to learn that as early as 1950, Israel's first Prime Minister, **David Ben Gurion**, predicted these trends when he said, in a Knesset speech: "The existing situation, in which the



United States and the Soviet Union guide and lead the world, will not last long, of that there can be no doubt ... and the two Asian countries – China and India – will be the most powerful in the world.”

For years Israel wooed Asian countries - first China and then India - but was refused. Only when the Iron Curtain fell did the situation begin to show signs of change. Over the course of the past three decades, the renewal of relations with China and India have brought increased trade, investments and economic ties.

Today, Israel imports consumer products that Asians make better, faster and primarily cheaper than we do. China and India have traditionally imported large quantities of Israeli fertilizers and diamonds; however, these exports show limited growth potential, while there is a rapidly developing export of technology eastwards in communications, software, hardware, drugs, medical instruments, agricultural products, or Israeli technologies sold to Korean, Japanese and Chinese manufacturing companies in “technology transfers”.

More and more Asian countries recognize the advantages of fostering a relationship with Israel. Korea established the Koril Fund, which builds bridges between Israeli R&D companies and the Korean manufacturing industry. India sends delegations that bring technologies from Israel to the developed provinces of Gujerat and Maharashtra. China has extended invitations to Israeli entrepreneurs to pursue development in China’s well-endowed high-tech incubators. Even the traditionally-reserved Japan is climbing on the bandwagon with a project for Israeli start-ups on the outskirts of Tokyo. The bilateral R&D agreements between Israel, India and China are key to promoting cooperation in an interconnected economic reality. Dozens of R&D projects are already under way on the Israel-China route, and similar developments are forecasted to develop with India in the near future.

East Asia’s growth will continue, and China and India are sure to be joined by Vietnam and Indonesia, Sri Lanka and Myanmar. More players in the Asian market will seek out their competitive edge in the production of technology products in their quest for the next breakthrough. Also to Israel’s advantage is the fact that growing Asian companies will require organizational tools, information, communications and computing. Asian industry will look for new sources of energy, wind, sun and wave energy—and all of them will be fast after the next brilliant idea to garner newspaper headlines and fill supermarket shelves. Fortunately for Israel, we have a plethora of resources to offer in this regard.

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Israel-China: Synergy in the making

In July 2015, shares on the Shanghai stock exchange fell by tens of percentage points. There are those who were surprised by this, and there were those who saw it as evidence of a strategic shift in Chinese policy. The direction of China’s economy is dictated, in large part, by the country’s strong, centralized government, and any fluctuation in the stock market is a sure sign of a change in the government policy behind it.

China is constantly changing, but for anyone looking in from the outside it takes time to grasp the change. In the 1980s, when China began to open up to foreign companies and export cheap products all over the world, China was still seen by many as a Communist dictatorship of tea, rice, blue uniforms and peasant hats. Public perception was slow to catch up and assimilate the fact that China was becoming a powerhouse. Today, as it becomes a manufacturer of advanced technological products, many are unable to see China beyond its role as a manufacturer of cheap, duplicated, or counterfeited products that aren't known for their quality or longevity. Our consciousness finds it hard to adjust to this change, but those who are able to bring this new facet of the Chinese economy into focus will be better equipped to use this understanding to their advantage.

As previously noted, China is well on its way to becoming world's biggest economy. It embarked on a worldwide acquisition spree, with an emphasis on importing technologies and new developments. As China emerges from its shell and continues to build relationships with the outside world, this will open up new paths to development. The synergy between Israel, the "start-up nation", and China, the "buy-up nation", was only a matter of time. Gradually, China is gaining a foothold here, too.

In the high-tech industry, the Chinese tripled their investments from 2012-2014. According to one estimate, 15% of investments in Israeli high-tech in 2015 can be attributed to Chinese sources. In acquisitions, we have seen a long series of deals in which large Israeli companies from various sectors were bought out, including, for example, Tnuva, The Phoenix, Lumenis and others just in 2015 alone.

China is on the brink of economic reform. The reform advocates the creation of an economic structure that operates according to regulated law rather than the decisions of lone appointees, a step towards loosening the government's grip on this sector. China is moving towards practices accepted in the world's markets: greater openness, more possibilities for foreign investment and entrepreneurship, and less red tape. These reforms will come into force gradually, reaching completion by the year 2020.

China's immense government-backed initiative to upgrade technologies and domestic R&D (under the heading "Innovated in China") will enable the country to access technology and embark on cooperative ventures with foreign companies in possession of innovative technology—and Israel is first on their list of countries to target.

Israel-India: Numerous business opportunities

India's outgoing ambassador to Israel, Jaideep Sarkar, recently announced that India intends to double its investment in R&D and scientific research, chasing the tails of rivals, China and Korea, in its national expenditure for R&D. Since it relies heavily on oil imports, the falling oil prices have allowed India to divert resources to research and development and pause to consider general economic reform.

According to Ambassador Sarkar, India produces 250,000 engineers per year and is steadily improving their academic training in the field. Sarkar estimates that within 20 years, India's rate of economic development will surpass China. This is fertile ground for advancing efforts to increase the volume of Israeli trade with India.

Relations between Israel and India have become friendlier since the recent election of Prime Minister, Narendra Modi, an avowed Israel supporter. Today, Israelis and Indians are eager to work together despite the rockiness of the past. The warming of relations between the two countries is happening in parallel to a notable stream of heavy Israeli investments in India in response to the economic policies of the new government.



Israeli industry is well-situated to the economic opportunities' India offers including Cleantech (of note here is "Clean India", a project initiated by the new Prime Minister, in which Israeli technologies are already finding ways to improve sanitation in the Ganges River); agriculture and food; water and energy; internal security, and the life sciences and high-tech. In slow but auspicious renewal of India-Israel ties, it turns out that the needs of the Indian economy can find answers in the Israeli comparative advantage.

While the opportunity is apparent, we must figure out how to effectively channel our strengths to the critical areas of the Indian economy and society. Despite the fact that cooperation at the institutional level is starting to make waves—and Israel has made a name for itself with our Indian partners in government—we must shift focus to establishing close ties with the Indian private sector.

The growth of the Indian economy is led by a burgeoning middle class. Currently 400 million strong, India's middle class is both driving the country's domestic growth and acting as a magnet for the import of products and services from abroad. The economic potential for Israelis in India is vast, but our relationship with this emerging economy demands careful attention, the right preparation, and priority on the national agenda.

Israel-Korea: A natural trade partnership

Korea is perceived as a country with a singular mission to conquer the world in general—and Israel in particular—with quality products at a reasonable price. However, Israel, as the start-up nation, arouses the envy of the South Koreans because of its achievements in innovation and entrepreneurship so much so that the President of South Korea, Park Geun-Hye, exhorted his people to take a page from their Israeli counterparts.

Korea faces an existential economic challenge—maintaining its technological superiority over China and narrowing the technological gap with countries such as Japan and Germany. The Koreans are innovative and adept at turning technologies into mass-produced products. But even Korean engineers sometimes admit that their true expertise is "innovation by imitation". In order to maintain their supremacy in the field, Korea requires core technologies—breakthrough technologies—to serve as a base for their products. As luck would have it, Israel has these in abundance - they are for sale. For

the Koreans, a partnership with Israel is a strategic move, offering access to critical technology from a non-competing economy in an arrangement that offers clear benefits to both parties

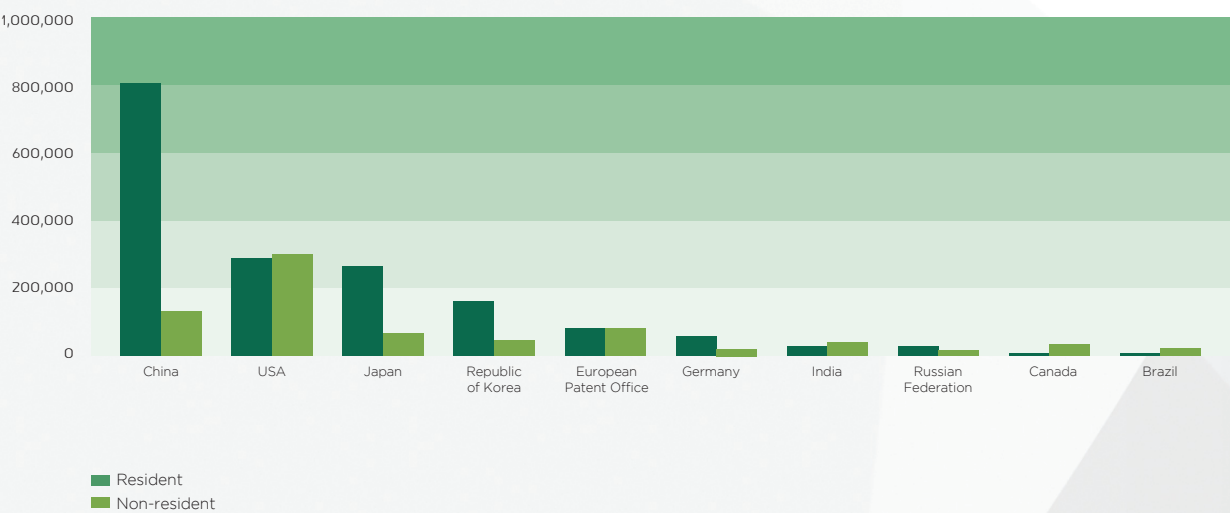
Israel-Japan: prime potential for Israeli export

Israel and Japan are both technology-oriented economies, and the integration of Israeli technologies into the many products manufactured and developed in Japan presents an opportunity for both countries.

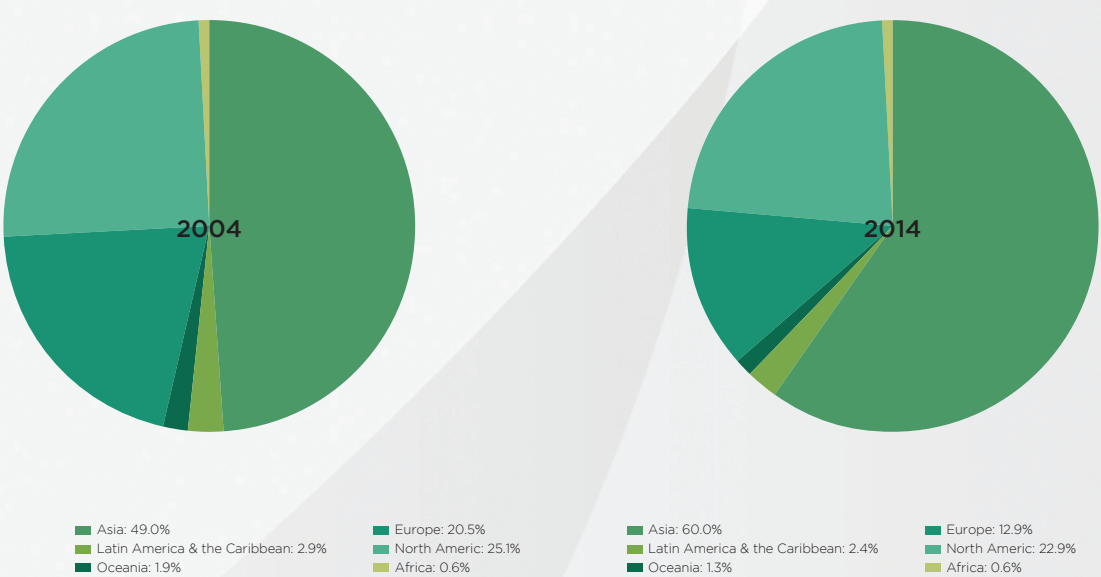
Five years ago, Japan got a new prime minister and Israel, a new opportunity. Under Shinzō Abe, who recently visited Israel, the Japanese government shook the dust from its ministries, lowered barriers to business development, initiated far-reaching changes in the relationship between the government and business arena, and is moving mountains to advance the Japanese economy after a slowdown spanning more than twenty years. Abe's government decided "to bet the house" in its efforts to rescue Japan from stagnation, and anyone who visits Japan today can easily perceive the changes afoot—including the country's attitude to Israel and trade with it.

Israel's economic opportunities in Japan lie in two main areas in which technological innovation constitutes a comparative advantage—water and environment and the life sciences, particularly pharma and medical instrumentation (of growing importance owing to the country's aging population).

Asia’s part in the global intellectual property world



Patent application by region



Source: Hisunin Financim Inc., 2015

A person wearing a white dress shirt and a dark, striped tie is shown from the chest down. Their hands are positioned to hold a glowing lightbulb icon. The lightbulb is white with a blue glow and is centered within a white rectangular frame. The text 'CHAPTER 3' is written in white, uppercase letters above a horizontal line, and 'Intellectual property in Israel: Legislation, work environment, results' is written in white, lowercase letters below the line. The background is dark and out of focus.

CHAPTER 3

Intellectual property in
Israel: Legislation, work
environment, results

Intellectual property is considered to be one of the most valuable economic assets at the disposal of companies and countries alike. For the Israeli economy in particular, about half of the country's total exports rely on technological products.

In recent decades, intellectual property has been swept up in the vortex of globalization, and as always, is strongly influenced by technological and legal changes happening both in Israel and beyond. The penetration of the Internet and social media into every aspect of our lives has not only given intellectual property unprecedented economic significance, but has also presented many new challenges, such as our ability to uphold and enforce copyright on the Internet.

The unique attributes of intellectual property, its growing significance in international trade, globalization processes and technological development demand that it receive greater legal and social attention.

Israel has made significant efforts to come into compliance with international intellectual property law and standards, as befits its station as a major player in the global technology market. After a long chapter in which Israel seriously lagged behind developed countries, and even found itself on the unflattering watch list of countries that are monitored for intellectual property violations, we are beginning to take steps in the right direction.

Recent years have seen Israel:

- Carry out changes and reforms in the Patent Office itself, including turning the Office into an executive agency with an increased staff equipped to handle patent examinations and raise the bar for professional fluency in staff across the board;
- Make the necessary adjustments in domestic law to come into compliance with international treaties such as the Madrid Protocol and the PPH;
- Join the OECD and make the relevant alternations to local intellectual property law;
- And implement a stricter enforcement system against counterfeiting and the smuggling of counterfeit goods.

As a direct result of these efforts, Israel enjoyed a boost in its global international intellectual property ranking. In the last special USTR report, known as the Special 301 Report and published by the American Department of Trade, Israel was removed from the watch list. In prior years, not only was Israel on the watch list but also on a priority watch list for countries being closely monitored.

To follow is a detailed description of the primary changes and improvements Israel made in its handling of intellectual property.

Improvements to the intellectual property registration system

The first and basic encounter of entrepreneurs, inventors, companies and corporations when seeking legal protection for their inventions is with the official body mandated in each country to register patents, models and trademarks. The quality of the work of this agency has considerable and clear implications for the willingness of these entities, including foreign investors, to act in that country, and certainly has implications for the extent of a country's overall industrial and technological development.

Until about ten years ago, the patent examination process in Israel was cumbersome and suffered from severe bureaucratic delays. While the time required in Israel for registering trademarks and models was reasonable (usually between a year and eighteen months), the time for examining patents was much longer (on average, over four years, with certain patents

spending even more time in the belly of the Israel Patent Office before seeing allowance). Given the lifespan of a patent (20 years), it was abundantly clear that delays of this scale caused significant damage to inventors seeking IP protections in Israel.

Examination delays stemmed, in large part, from a shortage of qualified patent examiners. While the training of patent examiners is no small investment of time and resources, many countries have taken decisive steps to strengthen their patent authorities with additional manpower. For example, the European Union set up the European Patent Office, which is an independently-funded, non-territorial organization financed entirely by applicants' fees. As part of a long-term plan to expedite patent examinations, the EPO has recruited and trained hundreds of patent examiners to join its ranks.

Owing both to its position in the world economy and its commitments to the international intellectual property community, Israel was obligated to enact significant reforms at the Patent Office, the arm of the Ministry of Justice responsible for the registration of eligible intellectual property.

In 2006, the government decided that the Patent Office would operate as an independent executive agency headed by the Registrar of Patents. In 2011, this status was officially committed to the books. This transfer of authority granted managerial, budgetary and organizational independence to the Office, both in matters directly concerning intellectual property as well as finance, budget and human resources.

In 2014, the Israeli Patent Office began serving as an international search and examination authority for both Israeli and foreign applicants. At the beginning of the year, an agreement was signed with the U.S. Patents and Trademarks Office whereby the Israeli Patent Office began to operate as a search and examination authority for international patent applications filed in the American Patent Office starting in October of the same year. Under this agreement, applicants from the U.S. could now choose to have the Israeli Patent Office carry out an official patent search on their behalf.

In accordance with the new agreements and in order not harm the wait list of national applications from the U.S., the agreement stipulated that in the initial stage the Patent Office would examine a maximum of 75 American applications per quarter so as to avoid overload. In addition, because Israel cannot examine applications dealing with business methods under the G060 international patent classification, this type of application would not be examined. By the end of December 2014, nine international search applications had been received from applicants in the U.S.

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Increased efficiency and output

Since then, the Patent Office has taken a number of steps to increase its efficiency and output. As a result, the average wait time for the first examination in Israel has fallen dramatically. The reduction of wait time is just one way in which Israel has successfully aligned itself with

global intellectual property trends. The data show that the average wait time for a first examination in the years 2006-2014 dropped from 50.2 months in 2006 to 29.4 months in 2014. The numbers for 2014 indicate a slight increase in the wait time relative to 2013, when wait time averaged 28 months, and certainly compared with 2012, which was 24.4 months. The 2015 anomaly can be attributed to the fact that the Patent Office dedicated resources to shortening the wait time for the second examination as a step to reducing the overall wait time. Furthermore, the same year saw a controlled diversion of examination personnel to activities surrounding Israel's new status as an international search authority.

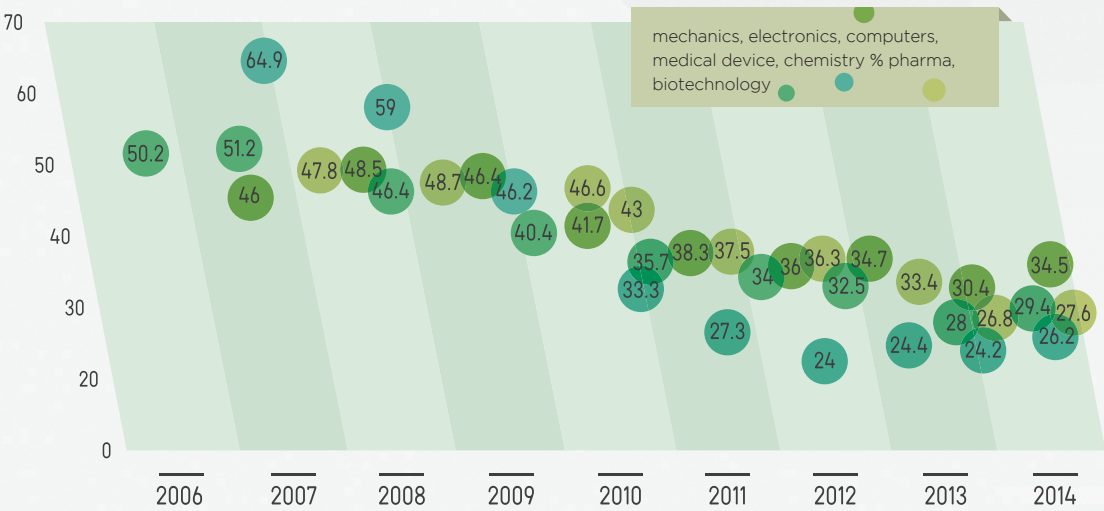


Figure 1: Average wait time (in months) for the first examination during 2006-2014 – divided by field
Source: The Israel Patent Authority Report, 2014

The year 2014 saw a projected 1.5% rise in the number of patent applications filed in Israel compared with the previous year, a figure that signifies a welcome change in the consistently lower estimates cited for patent application filings since 2011.

And what did we see on the world stage in 2014? Many countries recorded a rise in the number of patent applications in what appears to have been global trend which shows an annual increase of 4.5%. Especially notable was China (a rise of 12.5%), but also the U.S. (1.3%), Korea (2.8%), Germany (4.4%), and Canada (2.1%). In contrast, others registered a decline, among them Japan (- 0.7%), India (-0.4%), and Brazil (-1.8%). Returning to Israel – the number of applications which culminated in a patent, increased steadily from 2012. In 2014, a rise of 8% was projected for the number of patents granted relative to the year before.

This increase can be attributed to the end of the apprenticeship period of the fourth cycle of patent examiner training in 2013, resulting in the increase of patent examiners the following year. In addition, a new emphasis on efficiency alongside increased capacity bolstered by additional patent examiners, improved the quality of the examination. A few measures of note include better-quality examination instructions and the introduction of a new incentive-based pay system in the Patent Office. These steps led to significant shortening of the waiting time for the second examination, and consequently, more applications reached the acceptance stage than in previous years.

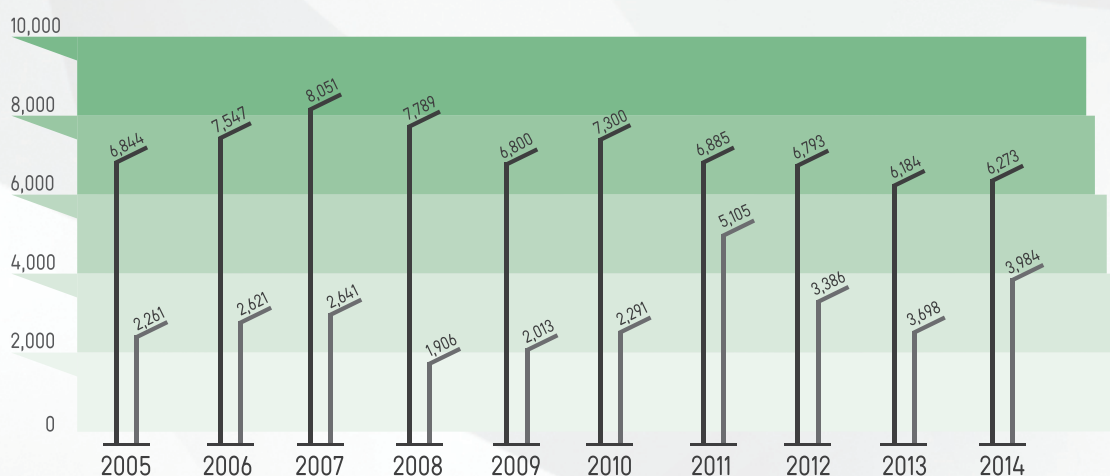


Figure 2: Patent applications filed in comparison to patents granted during 2005-2014
Source: The Israel Patent Authority Report, 2014

Also in 2014, the Patent Office began identifying professional lacunae requiring attention. A happy result of the efforts was a long-term training plan whose primary aim was the creation and preservation of knowledge within the patent examiners' department.

Pre-publication

The Israeli Patent Office conformed to international standards by amending the Patents Law of July 2012, making patent applications available online no later than 18 months from the date of filing (or the priority date).

Certification as an international examining authority

As we have already mentioned, one of the outstanding achievements of the Patent Office was its certification to operate as an international search and examination authority for international patent applications, under the aegis of the Patent Cooperation Treaty (PCT). This certification—which stemmed from a 2009 decision by the World Intellectual Property Organization (WIPO), a UN organization, validated Israel's status among other its colleagues in the intellectual property world and is a significant international recognition of Israel's technological capabilities.

Operation of the new service provided an efficient and inexpensive response for the growing international needs of Israeli patent applicants. Prior to Israel's certification as a searching authority, international patent applications filed by Israelis were examined by the international search and examination authorities in Europe or the U.S., whichever the applicant selected. The examination could now be conducted in Israel, a great convenience readily available to Israeli applicants at relatively low cost. A corollary of this new situation on the ground was a noted increase in the Patent Office's manpower (and its efficiency) as part of the preparations for becoming an international search and examination authority.

Green applications

The Patent Office aligned itself with numerous western patent offices with a policy encouraging patent applications for "green" inventions that contribute to the preservation and improvement of the quality of the environment. The examinations of patent applications designated as "green" are required to begin within three months from the date of classification.

The PPH plan

In mid-2012, the Patent Office renewed its cooperation with the U.S. Patent and Trademark Office's (USPTO) Patent Prosecution Highway (PPH), which started as a pilot in July 2011. In August 2011, the Patent Office and the USPTO expanded their cooperation and launched the pilot PCT PPH (Illustration 3).

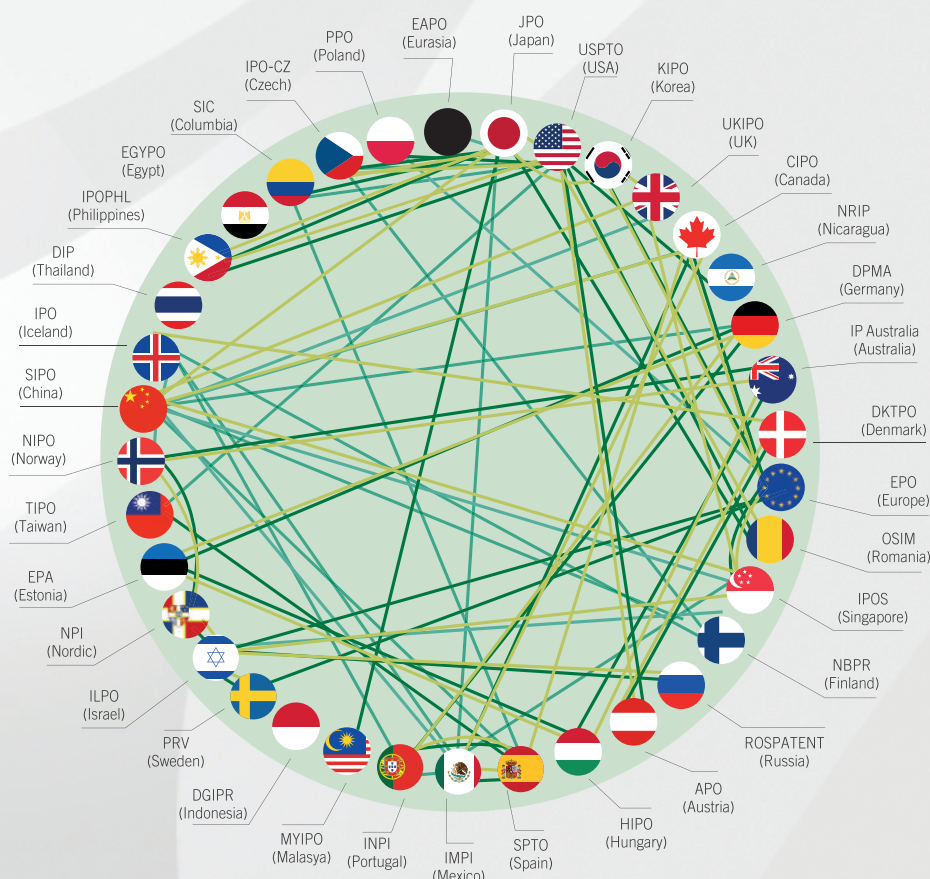


Figure 3 : International cooperation in the context of the PPH

Source: The Japanese Patent Office, March 2015

The PPH is a system for expediting and improving patent examination processes by fostering a network of cooperation between patent offices worldwide. Under the PPH pilot, a patent applicant who files an application in two countries can request a fast-track examination of his application in the second country after receipt of a favorable opinion in the first. This PPH participating patent offices to base their examination on colleagues' prior evaluations, reducing the load and shortening the list of applications awaiting examination.

In addition to this arrangement, in 2014 the Patent Office advocated for the signing of PPH arrangements that built on the fruits of existing international search authority (PCT PPH) agreements. The Patent Office has PPH and PCT PPH arrangements with the patent offices of the U.S., Finland, Denmark and Japan, and since 2014 also with South Korea, Spain and China. In addition, in December 2014 an agreement was signed with the European Patent Office to launch a three-year pilot for a PCT PPH arrangement commencing January 2015.

International cooperation

During 2014, the Patent Office deepened its cooperation with international offices and bodies, academia, and Israeli applicants. A number of new agreements aimed at expediting the PPH examination came into effect the same year including designation of the Israeli Patent Office as an international search and examination authority for American and Georgian applicants. In addition to these Agreements, in September a memorandum of understanding was signed for cooperation with the National Institute for Patents and Information in Tajikistan, for a preliminary period.

Adaptation of domestic law to international treaties

In recent years, Israel has passed a series of legislative amendments in order to adapt intellectual property procedures to those of developed countries and meet the standards of the international treaties to which it is a signatory. Among these are amendments to the patent regulations so as to bring them into line with the Patent Cooperation Treaty, by adding new methods of application, such as on a computer storage device (CDs or DVD), or on the Internet. The amendment also modified the PCT department's handling of the priority requirement when filing an international application, and allows whoever filed an international application electronically to also file the priority documents electronically.

The Madrid Protocol

In July 2010, Israel joined the international agreement for registration of trademarks under the Madrid Protocol. Starting September 1st of the same year, Israeli applicants began filing applications for the registration of international trademarks. For the first time, Israeli applicants were able to claim protections for their good and services based on an Israeli trademark.

It should be noted that prior to implementation of the new system in accordance with the Madrid Protocol, anyone wishing to register his trademark in foreign countries was obliged to conduct an independent and separate proceeding in each country. This compelled the owner of the trademark to hire the services of local lawyers or patent attorneys in each country at considerable expense, which made it difficult to put together an effective trademark portfolio in all target markets. In practice, the Madrid System simplifies and significantly shortens the process of trademark registration in many countries, making the registration of trademarks and protection of brands easier and less costly.

When it became a signatory to the Madrid System, Israel updated its trademark practices to meet the standards of other contracting states. Chief among the adjustments required on this front were:

1. To allow applications to register several types of goods or services at the same time (previously, separate applications were required for each type of product or service).
2. To extend trademark validity to a period of 10 years, renewable for additional periods of ten years each (unlimited).

The implementation of the Madrid Protocol led to a dramatic rise in trademark registration applications, and in 2014, the trademarks department at the Patent Office found itself inundated with an unprecedented workload due to the increase in the number of international applications filed in Israel. Nevertheless, the department met its internal targets.

Filing trends changed only slightly. The number of applications filed in 2014 is similar to the number filed in 2013, although the number of types applied for decreased slightly (by 6%).

The international applications filed pursuant to the Madrid Protocol still account for about half of all the applications in the department. 2014 was characterized by a significant rise in international applications through Israel as a source country: whereas in 2013 there were 149 of such applications, 240 were filed in 2014.



Figure 4: The number of applications files and the different types filed for registration and marks and goods registered during 2005-2014
Source: Israel Patent Authority, 2014

Joining the Organization for Economic Cooperation and Development (OECD)

After 15 years of negotiations, Israel was admitted as a member of the prestigious organization for economic development and cooperation, the OECD, in September 2010. Membership in the OECD was the culmination of a decade of concentrated efforts that began in the year 2000 when the Israeli government set its sights on membership as a strategic goal for the country.

The mandate of the OECD is to strengthen ties and encourage economic cooperation between member states. The OECD has exacting standards for safeguarding, monitoring and control of intellectual property rights, and membership required Israel to make further adjustments to its standards in this area. The Secretary-General of the OECD, Angel Gurría, who visited Israel in January 2010, cited intellectual property shortcomings as one of the primary impediments to Israel's acceptance into the organization.

Joining the OECD was an important milestone on Israel's trajectory to integration into the global economy and reflects the country's commitment to complying with exacting international standards, including those relating to intellectual property.

Enhancing the enforcement system against counterfeit goods and smuggling

Enhancement of the enforcement system against counterfeit goods and smuggling necessitated the expansion of customs officials' authority on the ground. Customs Administration workers enforce the terms of legality of import and export, prevent illegal activity (fraud, drugs, money laundering, intellectual property violations), and oversee all imports and exports. The Customs Administration is authorized to seize goods used or suspected of use in the perpetration of a crime, including crimes relating to intellectual property.



In recent years, the world at-large has in recent years has taken a harsher line in the punishment of those who smuggle goods in infringement of intellectual property laws. In Europe, for example, a law was enacted to streamline the fight against intellectual property infringements. The law significantly broadened the power of European customs officials, allowing them to act independently and without a request from the company whose rights were ostensibly violated.

In 1995, in the wake of the agreement that established the World Trade Organization and Israel's accession to it, the State agreed to adapt its laws by the end of 1999 to the Agreement on Trade-Related Aspects of Intellectual Property Including Trade in Counterfeit Goods (TRIPS). As a result, there were comprehensive changes in intellectual property legislation (but none in the customs regulations). The changes in the legislation and powers of customs officials afforded the owners of intellectual property the tools to address those who violated their rights and a new way to fight back. For example, they could now approach the Customs Administration and give notice of a violation, and if the Administration was convinced by the evidence presented to it, of the prima facie existence of violation of a right, it could then declare the import prohibited. Customs officials were also granted the authority to delay goods if there appeared to be a violation of copyright or a trademark.

INTERNATIONAL TREATIES DEALING WITH INTELLECTUAL PROPERTY

Below are details about the important intellectual property treaties relevant to Israel.

The Paris Convention

The Paris Convention addresses a number of significant aspects of intellectual property law, with the most practical one being the use of the Priority Law. The Priority Law enables the first to file a patent application, design or trademark in a Paris Convention member country to reveal the invention, product design or logo in public for a specified period without fear that during that same period someone else will copy it and file to register in another country that is a signatory to the treaty (over 174 according to the WIPO). The Priority Law thereby inhibits one's ability to obtain an unfair marketing, commercial or legal advantage. In accordance with the Paris Convention, the first to file a patent application has 12-month priority to file a similar patent application in a Paris Convention member country and also applies to trademark and design applications for a period of six months.

PCT

The Patent Cooperation Treaty (PCT) extends the Priority Law from 12-month under the Paris Convention to 30 months (and sometimes 31 months) in member states (currently, numbering over 140 countries). During this 18-month period (referred to as the international stage), it is possible to obtain a search report and opinion, which provide considerable information on the weaknesses and strengths of a patent application, and allow for revisions in the application before the end of the international stage and proceeding to the national phase, when the application is filed in on a country-level, according to the preferences of the applicant.

Madrid Protocol

The Madrid Protocol is a treaty enabling local trademark holders that registered a trademark with a contracting party (over 80 countries at present) to expedite registration in member states with a single application and fee.

The Nice Agreement

This agreement deals with the standardization of the classification of marks according to 34 different types of goods and 11 service classifications (a total of 45 classifications). Israel acceded to this agreement in 1961.

Berne Convention

This is the main copyright treaty for the protection of literary and artistic works. The convention prohibits copying or translating a work without the permission of its author, copying without his or her permission other than for fair use, and broadcasting, screening or public reading of the work without permission, as well as making any change, rearrangement or distortion.

TRIPS chapter of GATT agreement (Trade-Related Aspects of Intellectual Property Rights)

TRIPS is an intellectual property agreement among World Trade Organization (WTO) members (over 150 countries) which took effect in 1995. When a country joins the WTO it automatically becomes a contracting party to the TRIPS Agreement. The agreement established a common denominator for intellectual property law in contracting parties. Countries must adopt the agreed-upon provisions in their domestic laws within a designated period.

Intellectual property, patents and technological innovation in Israel

Despite the achievements of the Israeli technology industry, the downward trend in the volume of international patent applications originating in Israel persists, indicating a certain weakness in the pace of technological innovation. This new reality, contrary to the steadfast perception of Israel as the Startup Nation, should worry—and catalyze - decision-makers to take action.

Today, technological innovation is one of the key factors behind scalable growth.

At the macro-economic level, businesses, multinational companies and R&D centers exist to develop new technologies that meet the market's demand for sophisticated products, provide thought leadership, and deliver solutions that give the end user a competitive edge in their niche.

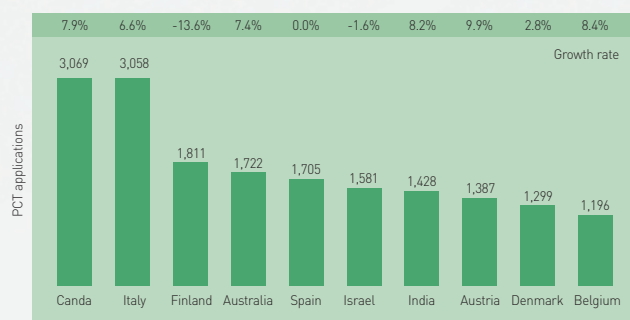
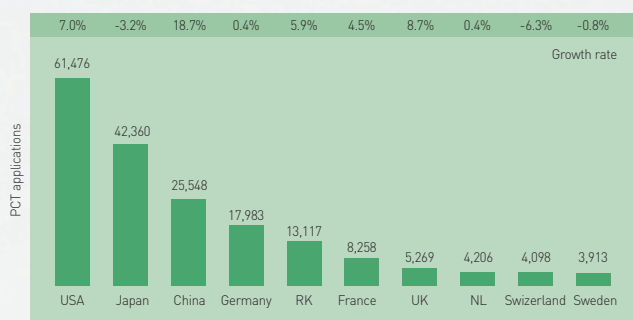
There are many ways to measure technological innovation at the national level, such as national expenditure for civilian R&D, human capital in science and technology, economic value and data points about activity in the science and technology industries, published scientific papers and their distribution, and the registration of patents.

For the purposes of this chapter, we will examine technological innovation through the prism of the generation of new intellectual property. Our measurement is based, among other factors, on the number of international patent applications (PCT) originating in Israel. PCT applications are a strong indicator of the current trend owing to the fact that patent registration is the first step in the release of innovative technology. The results of the research show that the indicated trends in technology in Israel and worldwide are largely reflected through the data for the number of international patent applications.

It should be carefully noted that while the number of overall international patent applications continues to climb (excluding a drop in 2008), the number of Israeli international patent applications has declined in recent years. With the understanding that patent applications serve as a barometer of technological innovation, the conclusion is undeniable: we are experiencing an innovation slowdown, both compared to the past and relative to the rest of the world. It is particularly noticeable when we look to countries such as China and Korea, which are exhibiting an opposite trend and showing demonstrable growth. In 2014 (the last year for which data have been compiled), Israel recorded a decline of 1.6% in the number of international patent applications.

With the exception of 2013 in which a slight increase of 1.16% was recorded, this trend is not new. In the years prior to 2013, a downward trend dominated: 2012 saw PCT applications drop to 8.2 %, and in 2011, the numbers had already fallen by 3.3%. The cumulative data points to a long-term, downward movement - especially alarming against the backdrop of apparent growth in competing economies.

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Source: WIPO Statistics Database, 2015

How can the decline in the number of international patent applications originating in Israel be explained?

We owe the current circumstance to several factors, two of which make themselves plain:

1. The shift in the center of gravity of innovation to overseas—the multinational R&D centers that were set up in Israel over the past few years by numerous giant companies such as Google, Facebook and Samsung, hired numerous Israeli developers and inventors. The intellectual property created in these R&D centers was registered and attributed to the companies and not to the geographical site where they operated, i.e. Israel. Now would be a good time to propose granting incentives and tax benefits to the multinationals so that the intellectual property stays in Israel.

A microscopic view of numerous green, rod-shaped bacteria, likely E. coli, against a dark background. The bacteria are illuminated with a green light, giving them a vibrant, almost glowing appearance. They are scattered across the frame, with some appearing in sharp focus and others blurred in the background. A white rectangular box is centered in the image, containing the chapter title.

CHAPTER 4

The drug and life science industry

No industry is as closely intertwined with the world of intellectual property as the pharmaceutical drug industry. Whether new drugs, generic drugs, or the design of medical instruments and equipment—patent protection plays a vital role in the industry’s development and commercialization.

In principle, countries formulate patent law independently. However, the TRIPS agreement stipulates a set of shared intellectual property standards which are binding in all member states. These standards create a common denominator of minimal intellectual property protections in general and for pharmaceutical patents in particular.

Drug development, R&D and intellectual property—A world view

Research-based drug companies are entirely dependent on the strategic wielding of intellectual property rights. In the absence of patents, it is uncertain whether such companies would invest the resources or shoulder the risk involved in bringing medicines to market. The average time required for drug R&D is uniquely high: development and licensing of a product can take anywhere from 12-15 years, and the cost is estimated at a staggering 900 million dollars.

Moreover, for every 5,000 chemical molecules filtered, only five, on average, make it to clinical trials. Of these, just one becomes a drug approved for the treatment of patients. Effectively, fewer than 20% of drugs that reach the human trial stage go on to receive regulatory approval. In addition, only an average of three out of ten prescription drugs generate revenues equaling or exceeding the R&D costs required to produce it. These numbers teach us that approximately 65% of drugs on the market today would not have made it to the development stage without patent protection. Conversely, the business model of the generic drug companies is based on patent expiration and the opportunity to manufacture similar or identical drugs.

The result is that ethical companies (which manufacture original drugs) and generic companies find themselves pitted against each other in fierce financial, legal and political battles which center on the question of drug patents’ life span.

While the ethical companies have a vested interest in maximizing the life of the patent, generic companies are looking to shorten it. Generic drugs are (relatively) inexpensive to manufacture and sold at a fraction of the cost of the original drug, often 30%-50% less. Consequently, a generic drug typically controls approximately 70% of the market just a few short years after its release.

Patent expiration

The patent expiration date is a moment of truth for ethical companies. A number of patents protecting key original drugs are set to expire soon, and the ethical companies are lacking new patents to fill the void. In order to remain profitable, experts forecast that many drug companies will seek collaborations or mergers to ensure their continued survival as the market share of generic drugs continues to rise.

Ethical companies have not seen the end of their woes. The traditional business model of the pharmaceutical industry is eroding. Major pharmaceutical manufacturers – which produce some 70% of the world’s drugs - are facing tremendous pressure with the advent of personalized medicine which is forecasted to become the norm by 2020. Instead of producing drugs that cater to a wide public, the future of the drug industry lies in “designer drugs,” customized to fit the patient’s genetic profile. For pharmaceutical manufacturers, income from every new drug will decline dramatically, and the economic feasibility of developing new drugs will become highly uncertain

The Global Drug market

The global drug market is worth an estimated \$850 billion. The largest players are the U.S. (accounting for about 50% of the world's drugs) and western European countries (mainly Switzerland, Germany and England), Japan and Israel, which is very dominant in generic drugs (primarily because of Teva Pharmaceuticals).

Sales of prescription drugs in the U.S. alone amounted to 374 billion dollars in 2014. New drugs launched last year brought in aggregate revenues of 20.4 billion dollars, of which about 11 billion dollars came from sales of Sovaldi for the treatment of hepatitis C, made by Gilead, and 2.6 billion dollars in sales of the breakthrough drug, Tecfidera, by Biogen.

The Israeli numbers are also impressive. In December 2014, the National Drugs Commission approved an additional 20 million shekels for the government drug and technology budget, which is estimated at about 6 billion shekels per year and is considered to be advanced and comprehensive by any measure. A significant portion of the new budget allotment will be channeled to the inclusion of treatments for hepatitis and breakthrough cancer drugs (Opoivo, Imbruvica).

It is no secret that the health market sector represents a substantial share of the Israeli economy. Israeli life science and biotechnology companies are not only extremely prolific, but also extremely profitable. Yet we must continue to ask ourselves if this growth is sustainable and look the risks (for investors, companies, and patients) squarely in the eye.

Changes in the intellectual property system in the U.S.

Historically, the U.S. has been a bastion of openness as far as patent law is concerned; however, between 2010 and the present, in the wake of a series of consecutive decisions by the United States Supreme Court, the situation has reversed itself.

The U.S. Supreme Court recently ruled that while human genes are not patentable, genes that have been manipulated through isolation or in new applications stemming from genetic research do qualify for patent protections. "The DNA sequence is a product of nature and therefore cannot be registered as a patent simply because its genes were isolated in the laboratory. However, the product of gene manipulation does not exist in nature and therefore falls within the definition of an invention that can be protected by intellectual property laws," wrote Justice Clarence Thomas in the majority opinion.

As a result, Myriad Genetics saw two of its patents for genes linked to the development of breast cancer and ovarian cancer revoked on US soil. The trial, which opened in 2009, revolved around the question of whether genes isolated in the company's laboratory constitute a "product of nature" or a "human invention". Throughout the trial, Myriad contended that it should be allowed to retain the patent, while the American Civil Liberties union (ACLU) and the Molecular Pathology Association argued that the patent would impede the advancement of research and would stymie efforts to lower the prices of genetic diagnostic tests.

The decision against Myriad fell in line with the previous decision of the same court which determined that naturally occurring phenomena are not patentable.

Without a doubt, the repercussions of the Myriad case will be felt in the field of genetic research as well as impact patients' access to medical tests. At the moment, however, **Justice Thomas'** ruling has thrown the biomedical industry into a bit of a tailspin. During the trial, voices in the industry warned that a sweeping ban on patent application for genome research would endanger projects already underway and hinder advanced treatments for diseases. The Obama administration, in an opinion submitted to the court, advised reaching a settlement in which existing patents for synthetic molecules (supplementary DNA) would be entitled to protection under intellectual property laws. Some predicted that Congress would overrule Obama's legislation, but this scenario has yet to come to pass. Instead, the trial resulted in a book of guidelines issued by the U.S. Patent Office (USPTO) which failed to untangle the mess, only heightening the acute feelings of uncertainty. Recently a public body appointed to address this issue; so far, discussions have been limited almost entirely to diagnostic testing, avoiding the more controversial questions that the recent changes in patent law present to the industry as a whole. The situation is truly worrisome.

The drug industry and intellectual property in Israel

As a result of changes in biomedicine around the world, multinational drug companies are eager to partner with research companies, universities, clinical laboratories, hospitals and even drug distributors, in order to identify new trends and develop effective products for the public.

This process is already under way, and in Israel we see large drug companies such as Roche and Novartis, and even Teva, joining forces with academic research centers for the development of new drugs and investing in small pharma and biotechnology companies.

As a center for the research and development of biomedical products and clinical research, Israel is in an excellent position to attract foreign investment. Until recently, Israel's potential was insufficiently tapped owing to a combination of legal, regulatory, and bureaucratic obstacles surrounding the protection of intellectual property rights in the drug industry

In order to join the OECD, Israel enacted a series of legislative changes concerning the intellectual property rights of pharmaceutical products in order to bring itself into line with the accepted standard in the Organization's member states. The principal impact of these changes is on the duration of patent term extensions which are available in Israel for certain patents protecting a new medical preparation or a new medical device. In this matter, Israel has dragged its feet compared to the West. Below is a brief overview of the present situation and the changes that Israel has made in order to improve the protection afforded to new medical preparations and medical devices.

Extending the original protection term of patents

The Patent Term Extension (PTE) system in Israel is complicated and convoluted. Furthermore, the local PTE provisions, appearing in the Israeli Patent Act Are full of lacunae and ambiguities that have not yet been addressed in the local case law. In addition, the PTE system in Israel is unbalanced and clearly favors the interests of the local generic industry over those of the ethical companies (the innovative companies, manufacturers of original drugs).

The PTE system was incorporated into the Israeli Patent Act in February 1998. The original protection term of pharmaceutical patents or patents which protect a medical device can be extended, subject to compliance with various statutory conditions. This legislative arrangement stems, amongst other things, from the growing international pressure on

Israel to improve the level of intellectual property protection in the country.

The principal reasons for incorporating the patent term extension system into the Israeli Patent Act are:

- Compensating the ethical companies for the lengthy regulatory proceedings needed in order to obtain a marketing authorization for new a pharmaceutical product, during which they are barred from commercial use of the patent-protected invention. Due to these lengthy proceedings, the effective patent term during which the ethical companies are able to commercially use the patented invention is much shorter than the nominal 20-year patent term.
- Balancing the impact of the 'Bolar' Exemption (the permission granted to generic manufacturers to conduct trials during the original protection term of the patent for the purpose of obtaining an authorization to market the generic substitutes immediately upon the expiry of the patent).
- International pressure to increase the level of protection granted under IP rights in Israel.

The Israeli PTE system is uniquely cumbersome in that it links the eligibility for and duration of PTEs in Israel to the duration and expiry dates of PTEs/SPCs (supplementary protection certificate) granted in six other countries ("Recognized Countries") which are the U.S.A., Italy, U.K., Germany, Spain and France. The duration of a PTE in Israel is equal to the shortest term of extension granted for a Reference Patent in the Recognized Countries, but, in any event, a PTE in Israel will expire no later than the earliest of the following dates:

- Five years from the expiry date of the original protection term of the patent (this is the maximal period of extension available in Israel);
- 14 years from the earliest date on which a marketing authorization for the product was granted in the Recognized Countries;
- The earliest date on which an order for the extension of a Reference Patent (PTE or SPC) expires or a reference patent is revoked in one of the Recognized Countries in which a marketing authorization for the product has been granted.

The following are the essential conditions for the grant of a PTE in Israel:

- The material (the active ingredient of the medical preparation or its salts, esters, hydrates or crystalline forms), or a process for its manufacture or its use or a medical preparation comprising the material or a process for its manufacture or medical equipment that requires licensing, is claimed in the basic patent and the basic patent is in force;
- The medical preparation is registered in the Israeli Drugs Registry;
- The registration of the medical preparation is the first registration enabling the use of its active ingredient in Israel for medical purposes;
- No extension order has been previously granted for the basic patent or for the active ingredient of the relevant medical preparation;
- If a marketing authorization for the medical preparation has been granted in the U.S.A.,

then, the grant of an extension order in Israel in respect of this preparation would be conditioned upon the grant of a PTE for a US reference patent protecting the preparation;

- If a marketing authorization for the medical preparation has been granted in at least one European recognized country, then, the grant of an extension order in Israel in respect of this preparation would be conditioned upon the grant of an SPC for a reference patent protecting the preparation in said recognized country.

Amendment No. 11 of the Israeli Patents Act, which came into force on January 27, 2014, introduced substantial changes to the Israeli PTE system. The following are the major changes that were introduced in the framework of Amendment No. 11:

- Reducing the list of the 21 Recognized Countries, on the basis of which PTEs in Israel were calculated, to six countries only, namely,– the U.S.A, Italy, Germany, the UK, Spain and France.
- Setting tight official due dates for prosecuting PTE applications.
- Adding the possibility of filing a PTE application for a pending patent.
- Regulating proceeding for examination of PTE applications in cases where the relevant PTEs/SPCs for reference patents have not yet been granted in the Recognized Countries.
- Abolishing the possibility of extending the due date for filing a PTE Application. Following the entry into force of Amendment No. 11, The due date for filing a PTE application in Israel in respect of granted or pending patents (90 days from the date of registration of the relevant preparation in the Israeli Drug Registry) can no longer be extended for any reason whatsoever.

Data Exclusivity Protection for pharmaceutical products

Another protection, which is available in Israel for medical preparations comprising a new chemical entity (NCE), should more accurately be regarded as marketing exclusivity.

According to the marketing exclusivity protection provided in Section 64D of the Pharmacists Ordinance, the Israeli Ministry of Health is not allowed during the exclusivity term to rely on information in the registration dossier of the innovative drug for the purpose of approving the marketing of the generic substitute in Israel. Nevertheless, this protection is much more limited than a regular data exclusivity protection insofar that the Israeli Ministry of Health is still able to rely on the innovator's data for the purpose of registering generic products during the exclusivity period. More importantly, the Israeli Ministry of Health can rely on the registration data to approve the export of generic products to other markets.

The data included in the registration dossier remains confidential even after the expiry of the exclusivity period and third parties are not allowed to inspect it. However, once the exclusivity period expires, the Ministry of Health is allowed to rely on the data in the registration dossier for the purpose of approving the marketing of a generic product.

The duration of the marketing exclusivity period for drugs registered in Israel as of August 07, 2011 is six years from the date of the first registration of the innovative preparation in the Israeli Drug Registry or six years and six months from the date of the first registration of the same preparation in a Recognized Country, whichever expires earlier (the term "Recognized Country" currently encompasses the following countries: U.S.A., Canada, a state which is a member of the EU, Switzerland, Norway, Iceland, Australia, New-Zealand, Japan).

Clearly, improved protection of intellectual property rights will encourage the registration of new drugs in Israel and boost competition between original drugs for the treatment of different diseases. It should be noted that the cost of importing drugs which are not registered in Israel far exceeds the cost of drugs registered in Israel (which are based on local intellectual property rights). Moreover, the absence of registration of these drugs in Israel will preclude any possibility of generic competition which had the power to lower drug prices over time.

Clinical research

As far as clinical research is concerned, no less than a thousand papers on pharmaceutical drugs are authored every year in Israel. The highly developed infrastructure in hospitals, the heterogeneous population, the access to information and partnerships continue to draw pharmaceutical drug companies to Israel. Clinical research brings in about \$350 million each year, and in the past decade alone, 1,300 new drugs have been approved in Israel.

Israel continues to attract large companies and enjoy a reputation as an innovator in the field, but complacency is the enemy of this vital industry. Eastern Europe and Asia are increasing their clinical research by 5-10% annually, while countries once considered leaders in the field are fighting to retain their standing. To ensure Israel's advantage, we must eliminate bureaucratic barriers that hinder clinical research. While the world moves forward, Israel seems to be marching in place. With no imminent changes visible on the horizon, we may soon see companies taking their clinical research to Eastern Europe and the Far East.

Depletion of Israel's comparative advantage in biotechnology

Israel enjoys a significant comparative advantage in biotechnology, a field which relies heavily on the strength of its human capital. Israel is third among OECD nations in percentage of university graduates, and 47% of the relevant age group (25 to 64) in Israel hold a university degree, compared to an average of 33% in all OECD countries. A considerable number of these graduates have degrees relevant to biotechnology: about 40% of Ph.Ds in Israel are in the life sciences, compared with an average 24% in OECD countries.

Unlike computer and information technologies, where demand seems to exceed the supply of skilled workers, biotechnology has a large reserve of skilled university-educated human capital: M.A. and Ph.D. graduates in relevant fields (biology, chemistry, biochemistry, engineering, agriculture) number about 15,000 over the past ten years. Conversely, the number of those employed in biotechnology in Israel is relatively low—only about 6,500. These numbers point to the vast potential for the development and expansion of the biotechnology in Israel as a whole.

Israel also boasts a competitive edge when it comes to academic excellence which has a direct impact on the quality of academic research. Relative to its size, Israel leads the world in the number of papers published in the life sciences; likewise, Israeli universities also feature prominently in world rankings in the field.

Israel's comparative advantage in biotechnology is not limited to the academic world; the impressive number of biotechnology research companies in the country also serves as a testament to quality of Israeli innovation. There are currently about 260 biotechnology companies in Israel, of which 220 are Israeli and 40 are foreign. These numbers place Israel fifth among OECD nations in the number of biotech companies relative to product

By comparison, in the U.S., with an economy 60 times the size of Israel's in terms of product, there are only nine times as many companies (approximately 2,000) focusing on

biotechnology. Furthermore, there are another 4,000 companies in the U.S. operating in fields that encompass some aspect of biotechnology.

Indicators for Israel’s comparative advantage in biotechnology

	Israel's Ranking in the OECD	U.S.	Israel
Competitiveness	9	1.6	1.5
Business investment in biotechnology as a percentage of product	5	0.16%	0.15%
Total number of patents per billions dollars of GDP	2	246	538
Number of new patents annually	12	4,132	141
Number of biotechnology companies per billions dollars of GDP	5	0.4	1.0
Total number of companies engaged in biotechnology	10	2,178	259

* Source: OECD, processed by international auditing firm BDO.
 ** Index of Israel's proportionate share in patents (PCT) in biotechnology relative to its share in all patents.
 ***2013.3/PCT 2012

The extent of the Israeli business sector’s investment in biotechnology R&D is among the world’s highest—approaching \$400 million, and Israel is fifth in the world in terms of that investment relative to product.

The combination of well-groomed human capital, the relatively large number of companies involved in biotech development, and substantial investment in R&D is a fruitful one, reflected in the numbers of biotechnology patents origination in Israeli companies. According to the OECD’s patent index, which measures biotechnology patent numbers relative to all patents produced by a given country, Israel finishes ninth out of the OECD’s 33 contracting states. Israel’s comparative advantage is measured at 1.5 in biotechnology, placing it just behind the U.S.’s average of 1.6. In absolute numbers, Israel is second among OECD countries in the number of biotechnology patents per dollar of product, after Denmark.

Medical instrumentation

The field of medical instrumentation is showing steady growth. The Export Authority recently published 2014 data which reveal that exports of medical instruments increased by 11% compared to 2013 and amounted to approximately two billion dollars. Of the 1,000 companies or so that operate in the life sciences industry in Israel, 70% focus on medical instrumentation.

Biotech cluster in Jerusalem

Jerusalem usually appears in public discourse in the context of political and religious disputes. This dialogue is laden with emotion and tends to obscure the fact that the city is also a metropolis of economics and employment. After all, Jerusalem is the largest city in Israel and has several important economic-occupational anchors that attract both job

seekers and investors. The life sciences are one of the city's most prominent industries which serve as an important engine for the city's economic growth.

Today, Jerusalem has a number of significant advantages in the life sciences. The city has several institutes of higher education, medical centers, and compounds that are very active in biomedical research and development. First and foremost is the Hebrew University of Jerusalem, a leader in biotechnology in Israel and responsible for some 43% of research in the field; Hadassah Medical Center – University Hospital, and Shaare Zedek Medical Center, two of the country's renowned medical centers are also based in Jerusalem. In addition, the capital boasts three technology-oriented colleges: the Jerusalem College of Engineering (JCE), the Jerusalem College of Technology (JCT) – Lev Academic Center, and Hadassah College. All this comes into play in at the Jerusalem Biotechnology Park (JBP) which is currently enjoying a renaissance of sorts. The triumvirate of universities, hospitals, and industry converge to position Jerusalem as the country's biotechnology leader.

Summary

While the life sciences industry in Israel is forging ahead, there is still work to be done on this front. Although we have been successful in making ourselves an attractive center for innovation based on scientific excellence and entrepreneurial spirit, there is still a long road ahead before becoming a mature and sustainable industry.

The scientific breakthroughs in biotechnology largely occur in the academic world. For these discoveries to mature into products, we must close the gaps between the scientific discovery stage and the product development stage. In most cases, the biotech industry can develop scientific inventions only as far as preliminary development of the product, after which, and especially where drugs are concerned, it must rely on the global pharma industry for continued development and commercialization. Israel is inexperienced in the development and commercialization of drugs and is unable to should the costly development processes totaling hundreds of millions of dollars without external aid. With the exception of Teva, there is not a single Israel drug company capable of bringing products from preliminary development stages to market. As a result, the bulk of the profit derived from the final product does not remain in Israel, even though local brainpower is responsible for the initial discovery that led to the new product.

Creating a mature and sustainable industry in Israel demands massive support from the State, Israeli and international finance groups, and joint ventures with multinational pharma companies. This is the only way to create local infrastructure, the environment and the climate for the growth of other companies that can build on the potential of the life sciences industry, significant revenues for the Israeli economy, and opportunities for continued development in the field



CHAPTER 5

Counterfeit drugs and smuggling

Alongside the dynamic pharmaceutical drug market in Israel there is a parallel market booming with equal vigor—the manufacture and trading in counterfeit drugs i.e. non-original drugs manufactured in non-pharmaceutical conditions. This phenomenon is not unique to Israel, and many countries are attempting to combat its effects with varying degrees of success.

Pharmaceutical crime is growing steadily around the world, hand in hand with the pharma industry itself. These criminals are not small fry; they are international organizations dedicated to the manufacture, theft and illegal trade of drugs masquerading as legitimate medical products. Beyond the counterfeiting of the drugs themselves, these criminals also fraudulently copy drugs' packaging, divert drugs from their original target countries (to markets where the dealers' profits are higher), and sell drugs illegally to pharmacies and consumers through newspaper ads and the Internet.

There is currently no precise data on the extent of the counterfeit drug distribution around the world, and estimates range between one percent of all drugs sold in developed countries to more than ten percent in developing countries. A more pessimistic estimate is that every fourth drug sold in developing countries is likely to be counterfeit. Yet another assessment suggests that as much as 50-60% of drugs in the third world are counterfeit. The leading countries in sale of counterfeit drugs are China, India, Russia and the United Arab Emirates. Three years ago, the U.S. Food and Drug Administration estimated that annual sales of counterfeit drugs worldwide reached about 3.5 billion dollars. Another estimate, published recently in the U.S., warns that if no concrete action is taken to combat counterfeit activities, annual sales are forecasted to hit a staggering 75 billion dollars.

Pharmaceutical crime in Israel

Several years ago, the Institute of Drug Safety, an international organization, published a report which ranks Israel tenth in the world for the number of instances of counterfeit drugs identified by enforcement bodies (other sources estimate that Israel is in eighth place.) Israel's "neighbors" in the rankings are hardly complimentary - Russia, China, Uzbekistan, Ukraine, Brazil and Peru. When publishing the report, its authors were quick to note that the findings do not necessarily reflect the actual extent of crime.

The dangers stemming from counterfeit drugs are many: first and foremost, they pose a danger to patients' immediate health and may even result in death (according to one assessment, between 500,000 to one million people die every year from consuming counterfeit drugs). Beyond the threat to consumers, counterfeit drugs damage manufactures' reputation, hurt sales, and chip away at consumer trust, resulting in considerable economic harm.

What is being counterfeited?

Original drugs, generic drugs (Viagra, Cialis, Levitra, weight-loss drugs), steroids, anti-carcinogens, antibiotics, hypertension drugs, and others are being counterfeited.

It appears that the absence of appropriate legislation, ridiculously inadequate punishment, non-enforcement of the law, parallel imports, the ability to purchase drugs on the Internet and a long, unsupervised supply chain create comfortable conditions for the counterfeit drug industry. Israel has its own unique characteristics in this regard as natural crossroads between the main counterfeit-producing countries in the East to the destination markets in the West, as well as its proximity to the Palestinian Authority (a major consumer of counterfeit drugs).



Drug manufacturers in Israel estimate that last year alone more than one million counterfeit and stolen drugs, valued at about 120 million shekels, were sold in Israel. However, the officials who deal with this matter—the police and the Ministries of Health and Justice—have no accurate data on the extent of the problem. Nevertheless, anyone even tangentially connected to the issue recognizes the existence of a deep-seated problem in Israel. According to public health officials, the problem and its impact are only slated to grow, and the need for proper enforcement is crucial.

The growing pressure of various organizations such as the Permanent Forum on International Pharmaceutical Crime (PFIPC), IMPACT—an international task force fighting illegal trade in medical products, which operates under the aegis of the World Health Organization (WHO), and Interpol and drug companies led to the establishment of the Ministry of Health's Pharmaceutical Crime Fighting Department in 2007. This unit, which answers directly to the Ministry of Health, deals with pharmaceutical crime, thefts and sale of the stolen drugs, counterfeit cosmetics, the use of drugs and chemical components to manufacture dangerous drugs, the use of drugs for purposes other than those indicated on the license, the import of anabolic steroids, and also trading in and marketing counterfeit veterinary drugs.

Despite the good will of the members of this unit, its operation is under-budgeted and under-regulated. The Knesset Information and Research Center prepared a special report on the subject which investigated the reasons behind the unit's downsizing despite its obvious importance. According to the results of the report, the Ministry of Finance allotted the Ministry of Health 140 inspector positions (70 in 2011 and another 70 in 2012), and the decision not to assign said positions was the prerogative of the Ministry of Health. The Ministry of Finance added in the interceding three years, the Ministry of Health has not requested any discussion of the matter in budget hearings.

According to the Knesset Report, an effective solution demands a holistic approach with the participation of all the enforcement bodies involved in this war. For example, the drugs unit of the Customs Authority notes that requires assistance every day, both in the central unit and at the border crossings, but because the pharmaceutical unit is so small, it is unable to meet those needs. According to UN regulations, the Customs Authority is required to monitor 23 substances that could be used to manufacture drugs. However, without consultation from the pharmaceutical unit, Customs officials are unable to properly identify the substances.

At the conclusion of this report, we will discuss our recommendation regarding the problem of counterfeit drugs and their smuggling, but we must state briefly here that without revised budgets and regulatory procedures for pharmaceutical unit at the Ministry of Health, as well as added manpower for the Customs Authority and the police, and increased consumer awareness of the dangers involved in using counterfeit drugs, these hazardous phenomena cannot be fought effectively. Legislative changes, harsher punishment, closer examination of the supply chain, and the adoption of new technologies for the monitoring, supervision, control, and identification of counterfeit drugs will also be required to make a dent in this booming industry.



CHAPTER 6

The high-tech industry and technological innovation

Israel's technology industry has earned international accolades and a position at the forefront of global technological innovation. However, these achievements also present their own problems and challenges, chief among them the need to ensure our continued advantage in human capital. The technology sector is on the brink of crisis, driven by the shortage of skilled workers (engineers and programmers in particular) and the crisis in technology studies.

Israel's high-tech industry has made impressive strides over the past two decades, the result of a unique ecosystem built on the fruits of technological education, civilian applications of the defense industry, and government aid in raising venture capital—which generated a sophisticated private venture capital infrastructure. In the 1990's, these factors on the ground met with a significant wave of immigration from the Commonwealth of Independent States that brought a large reservoir of talented engineers to Israel at the same time that the global computer industry shifted its focus from hardware to software, giving Israeli companies a tremendous edge in the global technology market.

While Israel (and, in fact, Zionism) has always emphasized scientific research and human development, partly in response to the country's lack of natural resources and the Arab embargo, in the three decades spanning 1984 to 2014, Israel redoubled its efforts on this front. Over the course of this 30 year period, Israel saw a 378% increase in the number of university and college students, an increase of 228% in national R&D expenditure as a percentage of product (from 1.3% in 1984 to 4.2% in 2014), and is currently ranked first out of 148 economies in innovation abilities, second in entrepreneurship and third in global innovation (source: IMD Competitiveness Yearbook). The annual Global Dynamism Index (GDI), which reviews 60 leading economies around the world, also puts Israel in first place (78.3) for technological and scientific abilities.

Israel's strengths in innovation and the quality of its human capital have attracted hundreds of technology companies from all over the world to set up shop in Israel. Today, more than 300 international companies including Facebook, Microsoft, IBM, Intel, Google, Apple, Cisco, Motorola, Philips, Applied Materials, Siemens, HP and EMC, have established R&D centers in Israel and have even purchased dozens of Israeli start-ups (see below). These big-name, multi-national companies employ some 280,000 workers, of whom some 52,000 work in R&D centers.

Multi-Nationals Added Value

New	SAMSUNG	300 employees and growing, 2 R&D Centers, 2013: 1 of 3 global innovation centers for startups, incubators, investment in startups, VC funds
New	HUAWEI	200 employees and growing, R&D Center
		10/13 – first R&D center outside US. Acquisition – Onavo \$150m
New	facebook	400 employees, 2 R&D centers, 12/12 – Campus TLV 1 of 3 global support centers for startups. Acquisition – 6/13 Waze: \$1b
New	Google	1000 employees, 3 R&D centers, 2011 – first largest R&D center outside of US, first acquisition: \$390m – Anobit. 2013 – \$350m acquired PrimeSense
New	Apple	8,000 employees, first R&D center outside the US, 4 R&D centers, 2 manufacturing facilities, investment \$7.3b, 2014 planned additional expansion \$6b; Developed: Pentium, Centrino, Core 2 Duo. Acquisitions: \$2b
	intel	
	Microsoft	800 employees, R&D strategic centers, first R&D center outside US, Azure accelerator: 1 of 3 global innovation centers for startups. Acquisitions: over \$700m
	IBM	400 employees, 4 R&D centers, 7/14 – launched IBM Alpha Zone, accelerator program, support center for startups, Smartcamos - Acquisitions – more than \$2b, 7/13 – Trusteer: \$900m
	EMC ²	1,000 employees, 2 R&D centers. 3/2013 - MassChallenge, startups ecosystem, only program outside of Boston. Acquisitions: \$835m., 5/12 – XtremIO: \$435m
	MARVELL	1,200 employees, R&D center, manufacturing facility. Acquisitions - Galileo: \$2.7b, RADLAN: \$195m
	hp	3,600 employees, 2 R&D centers, largest software development site outside the US
	BROADCOM	800 employees, 6 R&D sites. Acquisitions – over \$950m

Source: IVC Research Center

"New" – from 2011 on

Source: IVC Research Center

"New" refers to 2011 onwards Since the 1980's, one of the most active technology communities outside Silicon Valley has come into being in Israel. The breakthrough products coming out of Israel span the gamut—everything from medical instrumentation, to security products and irrigation applications. All this is happening despite a decline in investors' enthusiasm for technology companies, burdensome security problems (three intifadas and several military campaigns), a growing anti-Israel embargo, and a hostile atmosphere towards Israel in Europe and the U.S.

The growth engine of the Israeli economy

In recent years, the technology industry in Israel has been the driving force behind the country's economic growth. The technology sector makes the largest contribution to the country's export (about 50%, a leap of 3,700% since 1984), it has the greatest access to the world's capital markets, and actually is the only sector that successfully raised impressive sums of foreign capital for equity, as opposed to the government, the banks and Israel Electric Corporation (IEC), which only succeeded in raising debt.

There are currently 7,072 high-tech companies in Israel—25% of them in Internet, 20% in telecommunications, 19% in IT and organizational software, 17% in life sciences, 9% in cleantech, 2% in semiconductors and 2% in website technology. High-tech employees are estimated to number 288,348. With the addition of indirect employees multiply that figure by four: for every person working directly in high-tech, there are four who work in related services.

Israel also has one the world's most highly developed infrastructures in all the parameters required to create a thriving technology industry. The number of engineers and scientists as a proportion of the population is among the highest in the world, as is the number of new ventures. It is also worth noting that in Israel, 90% of inventors are local, as in India,

China, Japan and Korea. In other words, most of the technological innovation in Israel is the product of Israeli inventors.

The unique Israeli ecosystem

The strength of the Israeli tech sector rests on four “legs”: the military defense industry, which trickles down to the civilian sector; the close affinity between industry and academia; the presence of multinational companies; and the cumulative effect of all of these factors.

Israeli high-tech owes a great debt to the national defense system. The prestigious intelligence and computer units of the IDF and Unit 8200 in particular, release thousands of extraordinarily talented young people into civilian life every year. Many find their way into Israel’s cyber industry which, incidentally, was the recipient of 20% of the country’s R&D investments in 2015.

The complex Israeli reality—and more specifically, its security situation—are responsible for close ties between education and the military. The IDF identifies the most suitable recruits even before they leave school, invests huge sums of money in their training, and posts them immediately to the technology front line. While nobody can quantify this tremendous investment in human capital which evolves into the talent tapped by the high-tech industry (the number of Unit 8200 graduates behind Israel’s start-ups is no coincidence), its influence must be taken into account.

The flow of human capital, ideas and budgets from the military to the civilian market is one of the most notable features of Israel’s technology ecosystem. For visitors to the new high-tech park in Be’er Sheva—which stands on equal footing with similar high-tech centers around the world—it is immediately apparent that Israel is a priority destination for multinational companies.





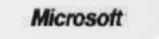






The ties between Deutsche Telekom, for example, and Ben Gurion University of the Negev and between the university and the IDF—which is relocating its computer communications and intelligence units to the Negev—have created a unique amalgamation of technological cooperation, notably in the field of cyber. When all this happens in a relatively small market, such multipliers are more than strong enough to create waves throughout an entire industry.

The defense system and the intelligence system seek out experts to analyze enormous quantities of constantly-changing, complex, and multidimensional data. This yawning need translated into increased training in Business Intelligence (BI), Artificial Intelligence (AI), and big data. The data-analysis skills acquired in the defense system trickle down to the civilian sector where they manifest in new industries such as cyber, which enjoys a steady flow of experienced manpower from the IDF.

In the early 1990’s, Israel invested in two programs that put wind in the sails of the high-tech industry, which up until that point, had been concentrated mainly in the defense industries. The Yozma program led to the establishment of 10 venture capital funds dedicated to attracting foreign investments. In parallel, the new technology incubator model began taking in 80 to 100 start-ups every year and provided extensive financing and support to early-stage startups. These two programs gave rise to the Israeli venture capital industry that went on to turn Israel into the “Startup Nation”.

By the 1990’s, most of the elements that we see in today’s high-tech ecosystem were already coming into place—academic institutions and research centers, service providers such as patent attorneys and auditors, global companies and more. The venture capital industry was the missing piece the puzzle, and once it too was in place, the road to success in promoting initiatives and innovation became faster and easier.

Israeli High-Tech Exits 2006-2015

Acquirer	Number of Acquisitions	Total Value \$m	Largest Acquisitions \$m
	11	6,558	NDS: 5000, Intucell: 475, InfoGear: 308, P-Cube: 200
	6	5,592	Mercury: 4500, Indigo: 719
	3	2,905	RADLAN: 195, Galileo: 2700
	14	2,212	DSPC: 1600, Replay: 175, Telmap: 120
	12	1,693	Trusteer: 650, XIV: 300, Guardium: 225
	4	1615	Given Imaging: 970, Oridion: 310
	21	1,478	Adallom: 320, Aorato: 200, Secure Islands: 77.5
	8	1,233	Waze: 1196
	10	1,204	Provigent: 313, VisionTech: 250, BroadLight: 195
	7	965	XtremIO: 435, ScaleIO: 250, Kashya: 153, Cyota (RSA): 145
	3	832	Shopping.com: 634
	5	831	Anobit: 390, PrimeSense: 360
	2	597	Omrix: 438, ColBar: 159
	7	344	Onavo: 150

Source: IVC Research Center

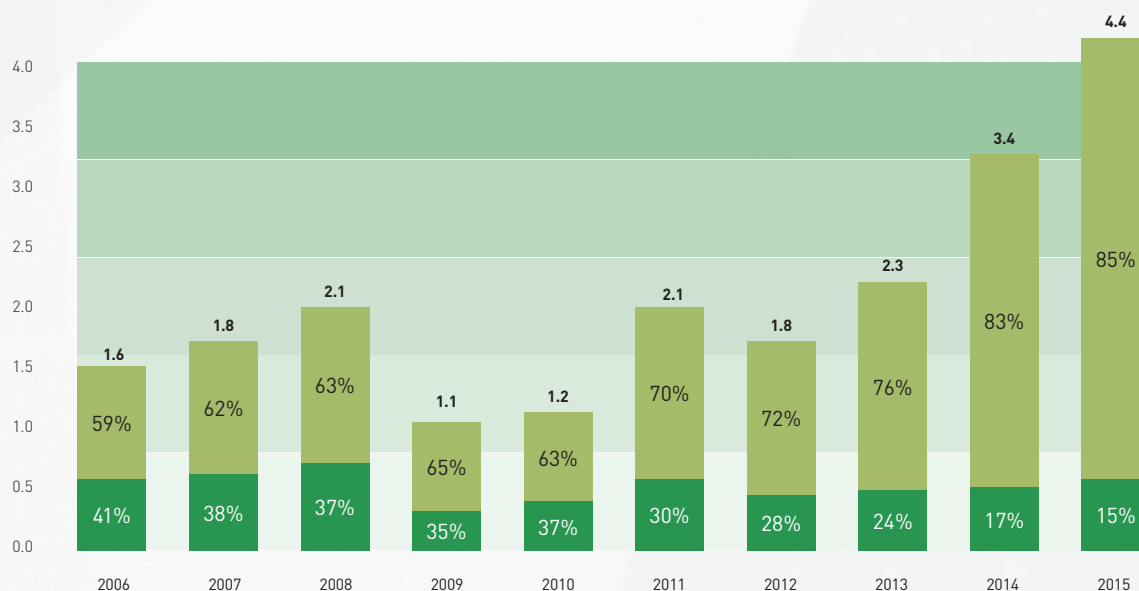
Source: IVC Research Center

Giant corporations such as Apple, EMC, Cisco, IBM, Broadcom, Johnson & Johnson, Intel, Microsoft and others are eager buyers for Israeli start-ups, hungry for their innovative technologies which comprise intangible intellectual assets (intellectual property). These acquisitions were not solely motivated by cash flow, impressive customer lists, or sales volume rather by the value of the proprietary technology on the negotiating table. There can be no doubt that intellectual property will continue to be the main attraction for multinational corporations looking to buy into or invest in Israel's high-tech sector.

In other words, intellectual property reflects technological innovation and is the core value in the sale and acquisition of high-tech companies.

The value of intellectual property can also be seen through the prism of venture capital investments between 2006 and 2015, when investments totaled an extraordinary \$21.8 billion, demonstrating a strong, consistent upward trend.

VC Investments in Israeli Startups



Source: IVC Research Center

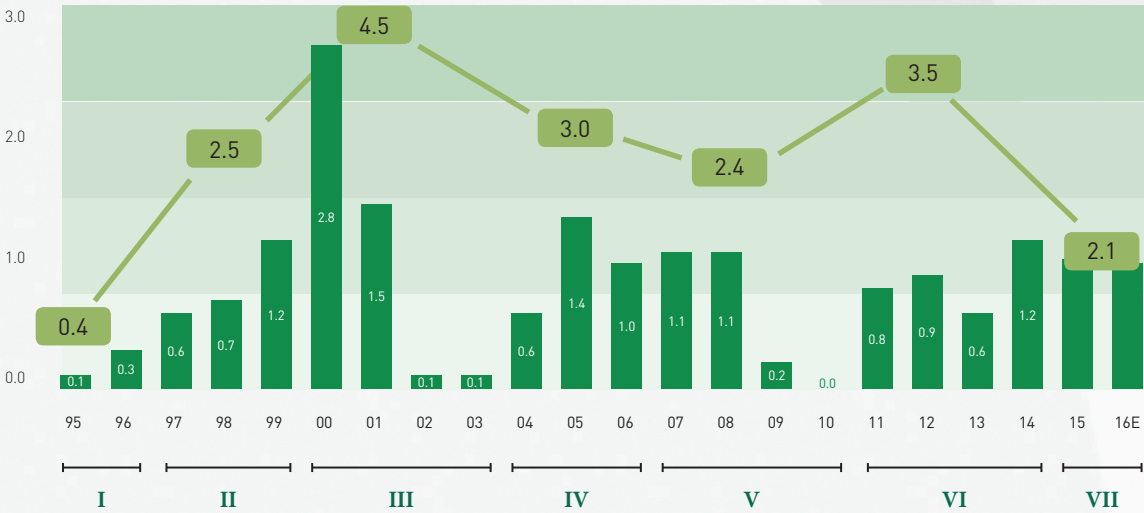
In 2015, Israeli technology companies set a new record in venture capital investments, raising \$4.4 billion, 30% more than in 2014. Nevertheless, the percentage of Israeli funds has sharply declined, increasing dependence on foreign investments, mainly from the U.S. Last year, 85% of venture capital investments in Israeli start-ups came from foreign funds. While there has been a rise in investments from China and others in recent years, American money continues to dominate. This is a challenge for the high-tech sector which reacts to U.S.'s economic fluctuation—notably the aftershocks of the 2008 crisis. In 2009, Israeli VC funds felt the effects in: American venture capital investments in the Israeli technology industry fell dramatically.

The amount of money raised by Israeli VC funds fluctuates wildly. These funds, once the mainstay of the thriving Israeli high-tech industry, have been gradually losing their power and influence. The decline in their status is apparent, first and foremost, in the noticeable decline in capital raised. Today, VC funds are less likely to invest in young high-tech companies, showing a decided preference for depositing their ever-decreasing investments with more mature—and less risky—companies.

Since 2000, venture capital funds in Israel have witnessed a steady decline in their ability to raise capital. Whereas in 2000 the funds raised no less than two billion dollars, in 2005 that figure fell to 1.4 billion, in 2009—200 million, and in 2010 the funds stopped raising capital altogether. There was a slight recovery in 2011 when the funds managed to raise about 800 million dollars barely scraping the bottom of the 2008 numbers. Overall, this trend remains unchanged.

2012 brought no real change—just more marching in place. The venture capital funds raised about \$900 million, slightly more than in 2011. In 2013, the numbers took a nosedive and totaled a mere \$600 million. Since 2014, there have been signs of improvement, with the funds raising \$1.2 billion and \$1.1 billion in 2014 and 2015, respectively. Projections for 2016 are in the neighborhood of one billion dollars.

VC Investments in Israeli Startups



Source: IVC Research Center

A bird’s eye view reveals that between 1995 and 2005, the venture capital funds raised \$14.8 billion with the entire period divided into six sub-periods, each of which reflects a business cycle. The graph indicates a noted rise in capital between 1995 and 2000—the year the high-tech bubble burst—and shows a steady decline from then to 2011, after which we see a reversal of the trend.

Another way of evaluating growth in the high-tech sector is by looking at the number of new companies that open every year. High-tech companies are significant producers of technological innovation and intellectual property even if they do not make an “exit” (statistically, few do). We can see that in 2015, there were 829 new start-ups compared with 1,029 in 2014 and 860 in 2013. The important number here is the four-year average—891 new companies since 2012, which is higher than the average in the four preceding years—434 new companies from 2008 to 2011.

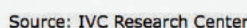
Israeli High-Tech Startups: Newly Established



Source: IVC Research Center

of Companies

Today Seed = Previous Small Round A
Main challenge – Round A Crunch



The high-tech sector: Impressive achievements and structural challenges

Above all, Israel boasts an abundantly entrepreneurial spirit, qualified human capital and exceptional innovation abilities. Few will succeed in matching the advantages of the Israeli engineer: complex system-wide vision, effective team work irrespective of rank, and the stubborn aspiration to do the impossible.

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industry faces numerous challenges which require extensive government involvement in order to preserve Israel's edge in the global market.

Some of the factors contributing to Israel's current situation include:

- A hyper-competitive global environment;
- A sophisticated and rapidly-changing industry;
- Diversity of technological fields, each with its own unique characteristics and needs;
- Total dependence on external target markets and consequent sensitivity to foreign economies;
- Lack of mature high-tech companies that can serve as an anchors of industry employment;
- Severe shortage of engineers to feed the high-tech industry;
- Steady and significant rise in the salaries of high-tech employees, which impedes the growth of start-ups who seek to employ them;
- Difficulties in the technology education that forms the backbone of high-tech manpower;
- Concentration of Israeli high-tech in a narrow geographical strip between Herzliya and Tel Aviv and minimal presence in the rest of the country, notably the periphery.

In addition to importance of maintaining a cutting-edge high-tech industry, the government should work to promote technological innovation in other industries and sectors in order to boost the competitiveness and resilience of the Israeli economy overall.

Recent data made headlines in Israel, heralding the end of the era of Israeli high-tech. According to a survey published by the chief economist at the Ministry of Finance, **Yoel Naveh**, Israel's status as a leader of global technological innovation has started to show cracks; the glory days are gone, and high-tech is no longer the growth engine of our economy. The Bank of Israel came to a similar conclusion in a report published as this one was going to press. The Prime Minister, it said, is considering importing software engineers to remedy the shortage of high-tech personnel. The Minister of Finance remarked at a press conference that he is considering offering perks to high-tech companies seeking mergers to solve the problem of the shortage of skilled workers. At the same time, the Minister approached the Tax Authority to discuss easing the bureaucracy to encourage investments to enable more high-tech companies to benefit from these crucial funds. And finally, a new report by the Samuel Neaman Institute unveiled a worrying statistic: according to a new OECD report, South Korea has overtaken Israel for the first time in national expenditure for research and development as a percentage of product.

Still, an analysis of long-term trends indicates that an unprecedented number of start-ups are operating in Israel, alongside the R&D centers of multinational companies. Investments from abroad continue to role in, and the number of new start-ups is steadily increasing every year. Exits continue to act as a source of returning income to the country, and successful entrepreneurs who have themselves made exits become private investors and advisors to new start-ups, continuing the cycle of innovation on a local level. A generation of Israeli companies is maturing in experience, value, and contribution to the economy—and these are in need of new sources of funding based on their new (higher) valuation.

The technology education crisis

It is the opinion of the authors of this report that one of the main challenges for Israeli high-tech is the crisis in technology education. There are worrying signs that the crisis is already here: the steady decline in the number of high school graduates with a 5-unit matriculation in mathematics (prior the launch of the new Ministry of Education plan). These young men and women are the candidates for university studies in science and engineering. The current evaluation system in which high schools are measured according to the number of matriculation exams rather than their quality (which is a key factor in university acceptance) does provide incentive for high

schools (and thus, students) to opt into advanced science studies (even though success in a high number of units in mathematics and science is a good indicator of academic success in engineering or science).

The full significance of a weakening of science curriculum can already be felt. Today, Israel suffers from a shortage of about 10,000 engineers. If in the past Israel's success relied in large part on its human capital, in just a few years we will be straddling a significant problem which may result in multi-national companies diverting their operations elsewhere. This would be an unthinkable crisis for Israel indeed.

The solution, however, is not simple—mainly because it is not in the hands of a single entity. Sadly, there is no quick fix. Israel needs a long-term, holistic process with the involvement of the State, the private sector and the third sector.

The plan for strengthening the study of mathematics is a step in the right direction, as is the adoption of the round table method, which brings together private entrepreneurs, relevant government ministries and the educational institutions. But mathematics is not enough; high school and matriculation studies are not enough. We have to think about the entirety of science and technology studies and come up with a plan for continuous education that starts in elementary school and continues through junior high and high school, military service and academic studies, and does not end with placement in technology companies.

Change in the business climate

Another point of concern is the growing international competition, particularly from Asia—China and India are breathing down our necks, and every self-respecting country in the world is investing considerable sums in R&D. In the current climate, the Israeli government must prioritize the creation of an economy and culture that will safeguard the place of innovation and entrepreneurship in it through legislative and financial action. The removal of the bureaucratic and regulatory barriers, incentivizing investments from within and without, and implementing a long-term plan that will reduce economic uncertainty of this sector and attract international bodies to expand their activity in Israel are just a few of the challenges facing the government.

A new government body, the Authority for Innovation, will shoulder many of these challenges in place of its predecessor, the Office of the Chief Scientist. The aim of the Authority will be to move at a pace akin to the pace of world markets—expediting processes and creating tools to support the high-tech sector with (less) red tape.

The first step is to create a supportive tax framework and reinstate programs that were used in the past to encourage institutional investment in high-tech. We should not lose sight of the vital importance of investment and the role of venture capital funds as the principal financiers of the young technology companies, which in the past 20 years have been the primary growth engine of the technology industry in Israel.

The subject of investment in R&D is critical in this context, notably the poor contribution of the government on this front. Government investment in R&D has been in steady retreat and currently stands on 20%. Fortunately, the government's reduced investment in R&D has been offset by increasing investments from the business sector and the multinationals. Today, less than 5% of the government investment in R&D is invested in the business sector, a relatively low number when compared to other western countries.

Helping mature companies grow

Over the past twenty-five years, hundreds and thousands of high-tech companies have opened their doors, but only about 50 have been valued at upwards of one billion dollars. Of these, at



least fourteen broke that barrier in the past two years. Without entering into a discussion of the merits of selling these companies at the technology stage or trying to grow them into prominent leaders in their field (the authors of this report believe that both options are essential to the continued success of the industry), the companies that are bought out at relatively early stages will continue to draw international companies to Israeli industry. One of the high-tech industry's challenges for the next 25 years will be to produce 50 local companies valued at one billions dollars. Currently, the numbers of companies that answer that definition number no more than ten.

The expansion of institutional investment

Financing is crucial to continued development, and the numbers give us cause for concern. More than 90% of investments in Israeli venture capital funds come from foreign investors. As it stands, the primary beneficiaries of the Israeli high-tech and life sciences industry are American pension funds rather than the Israeli public. On this note, Israel could take a page from the U.S. and other developed countries by shifting its focus to institutional investors and Israeli funds.

Diverting just 1% of institution investor funds, estimated at some 1.2 billion shekels, to investments in Israeli high-tech would enable the technology sector to take off once again. Obviously, such investment is not without its risks, but it certainly constitutes a smarter choice than the Eastern Europe real estate market (which is fast becoming a common destination for Israelis' investment dollars)

Wanted: A national reevaluation

The importance of the Israeli high-tech industry to the national economy cannot be overstated. This sector is not solely measured in terms of the number of people of people it employs both directly and indirectly, but also by its contribution to export the injection of foreign currency, Israeli leadership in global markets, attracting investors and investments, and strengthening the "Israeli brand" as a technological super-power ("Startup Nation").

The data present a mixed picture—even though Israel continues to exhibit overall strength, when we look to deeper at the state of exits and capital, a certain weakness becomes apparent.

Responsible government policy should provide an answer to these challenges. Nationally, this is the government's role—to support, push and invest in an industry that will find itself on the brink of crisis without sufficient planning and forethought.

What should the government do?

For the high-tech industry to continue to play a leading role in the Israeli economy, maintain the Israeli edge in global markets and ensure the best use of the country's existing intellectual assets, the government must formulate comprehensive national plan for the development of the technology sector based on the following principal elements:

- Fostering the human capital along the entire chain of production – the higher education system, the link between the academic world and industry, and the connection of all these to the military technology development system.
- Implementing regulatory and tax support of other platforms to raise capital for entrepreneurs and do away with crowd-funding over the Internet.
- Creating an additional safety net that includes tax breaks and benefits for investors, and channeling a portion of institutional investments to high-tech.
- Offering incentives to multinational corporations to set up their R&D centers in Israel.
- Decentralizing export to markets beyond the U.S.

- Providing aid for entrepreneurs, early-stage startups, and research institutes.
- Encouraging the development of generic technologies and the transfer of know-how from academia to industry.
- Allocating additional budget to research and development.
- Encouraging traditional industry to adopt new technologies that will give them added value in international markets.

To conclude, it seems that the circumstances that led to the success of Israel's high-tech industry are changing, and if we are to avoid getting left behind, the system needs to undergo far-reaching changes. As described in this report, part of the foundation on which the technology sector rests are still strong—a superior entrepreneurial ability, excellent academia, relatively high national investment in R&D, a national innovative penchant, and the ability to acclimate to the changing conditions of a competitive and dynamic global market. However, other factors that paved the way to Israeli success are eroding, particularly against a backdrop of accelerated competition from Asian countries, and creating a dangerous gap. These are critical times when the fate of the industry hangs in the balance. We must not only safeguard the achievement of the technology industry but also take the next steps to ensure our continued legacy.

The government must forge a clear path forward with a vision that places Israel's scientific-technological development at the top of the national agenda and draws on ample budgetary support, regulatory reform, and high-level inter-ministry cooperation.

As the backbone of the economy for three decades running, the Israeli high-tech industry has certainly proven that it deserves to be taken seriously by policymakers. We can but hope that the Prime Minister, who also currently serves as the Minister for Economics and Industry and the Minister of Finance, will have the wisdom to breathe renewed energy into this vital sector of the Israeli economy before it is too late.

The world's problem is Israel's opportunity

The economic damage resulting from cyber-attacks around the world costs billions of dollars per year. This universal security vulnerability provides a business opportunity for Israeli cyber-specialist companies that develop civilian and military protection programs.

Experts in Internet terrorism believe that cyber-attacks will lead to the collapse of critical and strategic national or military infrastructures such as electricity, energy, defense systems, transport, warning systems and emergency calls. According to some estimates, more than 500 million cyber-attacks occur every day around the world, many of them aimed at giant corporations. Of the Fortune 500 companies, 60% report dealing with information leaks, Internet fraud, and data theft.

The increasing frequency with which we read about attacks against countries, armies, banks and financial institutions expose the weakness of current security solutions. The economic harm from cyber-attacks is difficult to quantify, but the experts agree that it is in the billions of dollars per annum. A U.S. assessment puts the figure a hundred times higher than physical theft, and in Britain, cyber-attacks have cost the economy 48 billion dollars to date. As for Israel—the BBC report there are 1,000 cyber-attacks per minute aimed at Israeli targets.

Israel has managed to turn lemons into lemonade, creating successful industry to combat this shared security threat. There are about 200 cyber companies in Israel that develop civilian and military protection programs. Israel is recognized as a pioneer in the development and application of cyber protection. The cooperation between the military, the public sector,

the private sector and academia, make us a global laboratory in this field, and the world's problem with the cyber threat has become a new economic and social opportunity for Israeli companies.

The vision – Be'er Sheva as the National Cyber Center

Be'er Sheva is evolving as the national cyber capital, housing numerous cyber warfare companies, attracting international interest, creating workplaces for students and engineers, and driving this unique opportunity for regional growth.

A combination of factors merged to create a new “cyber valley” in Israel's Negev region: the Ben Gurion University has grown from 20,000 to 750,000 students in the past ten years and leads in the field of computer science; the IDF opened a technological computer communications campus; and Beer Sheva established a high-tech park and technology incubator with a cyber-focus. The cyber solutions slated to come out the Beer Sheva will help countries cope in their fight against the new, virtual terrorism strongholds.

Beer Sheva is the center of cyber activity, concentrated in the new 35-hectare high-tech park where both international and Israeli high-tech companies as well as the IDF computer communications unit have set up shop. The advent of cyber to a city once considered a backwater stands to shift the epicenter of innovation in Israel, finally making room for other parts of the Israeli map in the high-tech economy.

At the Park's opening ceremony, Prime Minister Netanyahu said: “I have a dream of seeing Be'er Sheva realize its potential as a global high-tech center. Ben Gurion's vision has yet to come to pass. Without an anchoring business presence in the city, the spark to ignite change was missing. In the future, all the prestigious units of the IDF will come here, and even this is a significant contribution to the region's economic future, the crowning achievement will be the national cyber headquarters that will make its new home here in the high-tech park. Be'er Sheva will become the cyber center of Israel and one of the world's leading high-tech cities.”

In addition to bolstering Israel's status as a technology power, Beer Sheva and its surroundings also stand to benefit from this influx of industry to the capital of the Negev. It is estimated that within the next few years, 5,000 – 10,000 new jobs will be created in and around the high-tech park. In addition, we will see significant growth of small and medium-size businesses, new places of entertainment and culture, and a massive migration of tens of thousands to the south of the country.

High-tech is an important catalyst for regional growth, and it must engine be made accessible to diverse areas of the country and new populations. Cyber leadership is one of Israel's strategic assets with the potential to play a role beyond its immediate security applications. The cyber industry, with Beer Sheva at its center, stands to have a profound economic and social impact on the Southern region in particular and Israel's relationship to the periphery in general.



copyright



CHAPTER 7

Copyright protection

One of the most prominent national indicators regarding a country's ability to safeguard IP is the ability to protect copyright and enforce copyright when it comes to software, music, films, books, designs, and so on. These industries are the clearest expression of intellectual property, since their products are the tangible results of intellectual activity. The unbearable ease with which software, films and music can be copied underscores how vulnerable these industries are to piracy and the glaring need to do a better job of protecting them. These factors are all considered in assessing the intellectual property regime's enforcement of laws against those who trade in counterfeit goods and brands.

The legal framework – The Copyright Law, 2007

In May 2008, the new Copyright Law came into force, replacing the 1911 mandatory ordinance. The new law is intended to create “the necessary balance between the need to establish an appropriate incentive for creating by way of granting financial rights, and the need to enable the public to use intellectual assets to promote culture and knowledge, while preserving the freedom of ideas, expression, and fair competition.”

In the eight years since the new law came into force, the courts have walked a fine line between the need to incentivize creators and the equally pressing need to allow the public access to intellectual assets.

This chapter reviews the Israeli courts' interpretation of the copyright law in a number of industries and includes our suggested amendments to sharpen the delicate balance at its center.

Protection of computer software and applications

Computer software is protected by copyright law. A copyright grants protection for the expression of an original creative idea developed by a copyright proprietor, usually after substantial investment of time and resources that include programming, classifying and writing the software code. The demands on modern software are constantly evolving, and today's software must be capable of communicating with numerous hardware and software applications. Granting software companies a monopoly on the fruits of these labors incentivizes continues development and makes proper intellectual property protection a non-negotiable aspect of sustainable growth.

In the past, copyright protection for software centered on a “copy” right, which was traditionally seen as the material-financial right granted to the proprietor. The right protected and still protects against physical copying of software on CDs and disks, and primarily computer games and game consoles.

Today, with the transition to cloud computing, fewer programs are physically copied and most offenses take place on online platforms so that a skilled user allows other users unlicensed access to copyright-protected programs.

The new Copyright Law provides an answer to this problem under a clause titled: “making available to the public”. Usually, when an unlicensed entity hacks into protected software and creates a link to that software on a site accessible to the general public or to other users, a number of infractions are perpetrated: (1) copying / downloading the software to a computer in order to hack it is an infringement of the copy right; (2) placing a link to the hacked software is an infringement of the “making available to the public” clause; (3) unlicensed running of the software in order to use it requires that it be stored temporarily in the computer's RAM (this constitutes a temporary copy and another instance of unlawful copying). The law introduces an important provision—of particular relevance to software—that widens the circle of infringers to include the



indirect infringer. The indirect infringer is defined as anyone who makes commercial use of an infringing copy of a protected work.

Under the law, knowingly possessing an infringing copy for business purposes constitutes an indirect violation of copyright. It should be noted that an infringing copy is not necessary an illegal copy. Software with a lawfully purchased license but which is used not in accordance with the terms of the license can be considered an infringing copy, and its continued use constitutes a violation. In a recent court decision, it was ruled that a company that provided technical support services for users of protected software, committed an indirect violation of copyright.

“Possession of an infringing copy for commercial use is sufficient to constitute an indirect violation under section 48(3) of the Copyright Law, 2007, which prohibits ‘possession for business purposes’ of an ‘infringing copy’, knowing it to be infringing.”

To prove an indirect violation, the copyright proprietor must prove all of the following conditions:

1. The existence of an infringing copy.
2. Proscribed commercial use of the infringing copy.
3. Real or practical knowledge at the time of committing the act, that the copy was an infringing copy.

We believe that the cumulative terms prescribed in the law create an appropriate balance between the need to allow the owner of the copyright to be compensation by whomever enjoyed the fruits of the infringement (even if he did not commit a direct infringement) and the need to protect whomever acted as a good faith infringer (unaware that they were in possession of an infringing work).

In order to mitigate the lack of clarity in rulings concerning indirect infringement, we recommend adopting a clause from U.S. Copyright Law known as the “cease-and-desist” procedure.

According to this clause already making its way into some district courts, Internet site managers will not be held accountable for copyright violations if a direct approach was made to them concerning material that is suspected as infringing and they removed it within a reasonable amount of time.

However, until further amendment of the law, we recommend that webmasters publish a user agreement which includes a cease-and-desist procedure for the site. A clear-cut policy can prevent subsequent allegations of infringement and remove liability from the site manager in the event that infringing content is uploaded to his site.

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The music and film industry

Technological advances, especially file-sharing sites and use of the cloud, continue to challenge the music and film industry and the economic models on which they operate.

Like software, musical and cinematic works are protected by copyrighted. Most violations take place online, and therefore most of enforcement efforts are directed not only at the immediate infringer (the creator of the infringing copy), but also towards whomever submits the infringing copy to the public, i.e. Internet providers and content aggregation sites.

Two fundamental cases in the Tel Aviv District Court in 2015 culminated in seemingly conflicting decisions. The haze surrounding these rulings hinders the ability to take action against an Internet provider or website broker that provides access to infringing material. Until the Legislator acts to remedy this situation, we can expect more of the same.

Motion for blocking orders against Internet providers

An important decision of senior Judge (ret.) Gideon Ginat granted relief against third parties, Internet providers in Israel, whom he ordered to block access to the Unidown site, a platform for converting music content from You Tube to MP3 files for downloading.

The court ruled that a decision to grant relief against third parties is in keeping with similar decisions in England and that there is no impediment to issuing an order against the Internet providers, even if such action is not regulated under the law. The Association for the Protection of Internet Copyright and various production and broadcasting companies attempted to leverage this precedent to block the Popcorn Time site which hosts a popular service for watching copyright-protected movies and television programs.

An interim proceeding in the Tel Aviv District Court (Judge Altuvia Magen) dismissed the motion of copyright proprietors against Internet service providers. The court applied an earlier decision of the Supreme Court as a precedent instead—a decision ruling that orders should not be issued against third parties where the injured party has no direct case against said third party. The proprietors' motion to appeal was dismissed.

As long as copyright law lacks a sharp edge, infringers will continue eschew the consequences. It is an intolerable situation in which copyright proprietors are left adrift without any tools capable of realizing their intellectual property rights.

In our opinion, correct handling of this matter necessitates the adoption of law similar to those applicable in Europe and the U.S. where the possibility of charging Internet providers who fail to remove infringing content in response to a cease-and-desist letter is an accepted practice.

On the other hand, methods that prevent abuse of the right by regulating exceptions such as the private use exception should be permitted. The private use exception set out in an EU directive allows the user of a legal copy of protected content to copy or convert lawfully purchased content to other formats without such copying or converting constituting a violation, provided it is for private use. For example, this concept might apply to the conversion of a song from a lawfully purchased CD to an MP3 file or other music format in order to listen on a portable device. The private use exception achieves an appropriate balance between the need to protect the owner of the right against mass commercial violation of protected content, and the public's right to access lawfully acquired content.

The private use exception achieves an appropriate balance between the need to protect the owner of the right against mass commercial violation of protected content, and the public's right to access the content

Protection of commercial brands

Today more than ever, the Internet enables easy, rapid and inexpensive access which sometimes connects a rights-violating producer with a potential importer seeking to penetrate the local market with products that resemble or imitate successful brands which are copyrighted or have trademark protection. Brand counterfeiting in Israel is gaining speed and eliciting concern from the business sector. Although the Customs Administration within the Tax Authority attempts to mitigate flow of counterfeit goods into Israel, it is powerless to deal with the full extent of the problem.

Distribution of counterfeit products and the attempts to import infringing goods to Israel harm both the owners of the proprietary rights and Israel's economy, which misses out on business profit and the resulting tax revenue. Moreover, the injured parties are mainly the consumers, who use their hard-earned money to buy counterfeit products which could be harmful to them and their health.

Which products are susceptible to counterfeit?

The list is long and includes fashion, perfumes, pharmaceutical products, stickers, footwear, alcoholic drinks, toys, and more.

Punishing infringers

Under sections 200A of the new version of the Customs Ordinance and section 65 of the Copyright Law, 2007, the Customs units at ports and border crossings are authorized to detain goods suspected of infringing trademarks or copyright for three days.

According to Customs procedures, the seizure units of the Customs Authority can use their discretion to initiate the "short procedure" or "the long procedure".

In the short procedure, which is applied in most cases when the quantity of seized goods is small or when the cost of destroying the goods is negligible, the seizure unit contacts the owner of the right (or his legal representative) and requests that he submit an opinion based on photographs or small samples of the goods, regarding whether or not the seized goods indeed appear to constitute an infringement within three days from receipt of the notification (this window can be extended by an additional three days, if necessary). The Customs Authority will destroy the goods at no additional cost if the owner of the right submits a letter of indemnification to serve as a defendant if the importer sues the Customs Authority and a judge finds that the goods, in fact, did not infringe lawful rights.

If the Customs Authority decides to opt for the long procedure, the owner of the right is required to submit a bank guarantee of a value determined by the Authority within three business days. Within ten days, the legal importer must file a claim against the infringing importer in court. After receiving a deposit of the guarantee based on the quantity of goods, the Customs Authority will furnish the rightful importer with the details of the infringing importer. The Customs Department at the Ministry of Finance are required to sign off on any agreement reached between two parties.

The challenges of brining infringing importers to justice

Notwithstanding the efforts of the seizure units at the ports and border crossings to prevent the import of infringing goods from entering the country, proprietors often find themselves unable to take action against the infringer owing to enforcement and collection difficulties. In this absurd situation, the infringer often ends up in possession of his original counter band and can market it without restriction or punishment.

We owe this strange reality, in which the offender gets off scot free, to the confluence of numerous circumstances. Among these is the fact that infringing goods are often brought in by residents of the West Bank, who are largely undeterred by proceedings against them in Israel.

It is worth noting that when a large quantity of counterfeit goods are seized, the proprietor of the right is required to deposit a bank guarantee, which could be for tens of thousands of shekels, merely to obtain the details of the infringing importer. Only after receipt of that information and when he is already enmeshed in the proceeding, can he assess the viability of a settlement versus legal action.

This situation is frequently exploited by infringing importers who often estimate the cost of storing and destroying a certain product at an amount far and above the legal expenses and the financial compensation that the owner of the right can expect to be awarded if he decides to file a claim. In this upside-down dynamic, the importer will refrain from negotiating with the owner of the right in order to force him into a settlement and leave him with the bill for the storage and destruction of the goods. The outcome is that the owner of the right, who invested in the development of the brand, reputation, and registration of trademarks in Israel, is now compelled to pay merely to protect the right he has already established under the law.

We recommend several changes for improving enforcement and correcting the imbalances apparent in the current situation:

1. To amend the law so that infringing importers are required to deposit a bank guarantee with the Customs Authority as a condition for importing goods in the future. The guarantee will be forfeited if the importer does not comply with the law.
2. To bolster civil and criminal enforcement against importers of counterfeit goods- before and after they enter Israel. To this end, Israeli Police and the Ministry of Economics must allocate additional manpower qualified to identify counterfeit material.
3. Both compensation for legitimate importers and punishment for infringing importers should be raised to create the proper deterrent effect.

The law should be amended so that infringing importers are required to deposit a bank guarantee with Customs Authority as a condition for importing goods in the future. The guarantee will be forfeited if the importer does not comply with the law

The new Design Law

The Patents and Models Ordinance came into force in British Palestine in 1924. Following the creation of the State of Israel in 1948, most of the section dealing with patents was voided, while for models (designs), the ordinance remained in full effect. Design law enjoyed a series of amendments in 1967, leading to the status quo of the last 50 years. In 2015, the government published the Designs Bill, which is slated to replace the remnants of the mandatory ordinance and bring Israeli design law into the 21st century.

Under the proposed law, registered designs will enjoy 25 years of protection (versus the current 15) provided they meet the conditions of novelty and originality. New candidates for design protection include fonts, icons and screen savers, already standard features of the modern design landscape.

Protection of fonts

Previously, fonts could be protected under copyright for a period of 70 years; however, the scope of the protection was narrower, zeroing in on the prohibition of duplication by without consent of proprietor. Under the new bill, fonts will enjoy protection for 25 years and the protection will extend to the production, marketing and sale of similar design. It should be noted that while this legislation stands to make a significant improvement to the present situation, some European countries are already a few steps ahead of us – registering designs for interior spaces! See, for example, a space registered in the European Models and Trademarks Office (OHIM—Office for Harmonization in the Internal Market). The design is originally Turkish.

Protection of an unregistered design

The Israeli Legislator will grant short-term protection to design owners who have not registered their design. Designs that were first published in Israel and which are new and different from designs already on the market will enjoy automatic protection from duplication for three years. If another designer makes a similar or identical design, without copying, the two designs will live side by side without either suffering any legal consequences. Furthermore, unlike a registered design for which an injunction can be obtained against those who infringe it, the owner of an unregistered design will be compelled to initiate a legal proceeding for his unregistered design, to prove that it is new, the date of its publication, and so on. The relatively low cost of registering a design at the Patent Office in Israel with the cost of legal proceedings places designers in a precarious situation. Small designers may waive their rights entirely and opt not to sue large companies that infringe their rights due to the overwhelming legal costs.

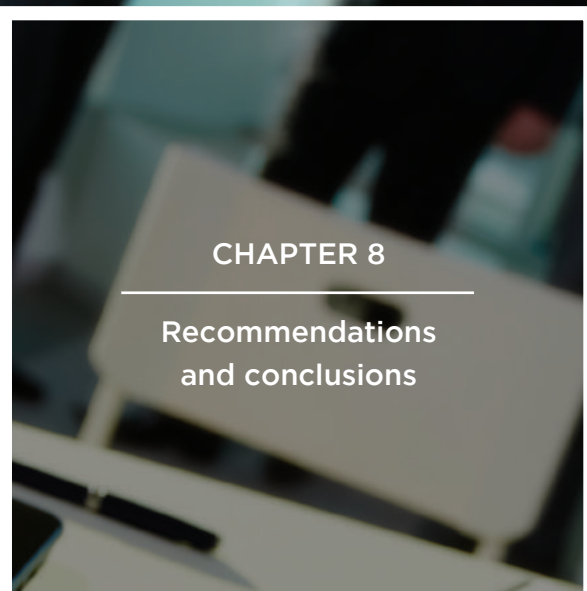
Moreover, the absence of an immediate registration requirement will compel the designer to cope with other designers who wasted no time registering similar designs in Israel and were granted protection before the unregistered design was published. The law permits a designer who has already published his design to file an application to register the design within a year of the first publication date. This year-long interval allows the designer to consider the potential of the design and decide whether it is worth his while to continue protecting it by registration. It seems that this would be the preferred strategy for small designers and fashion designers, who cannot always foresee which of the designs in their collection, will meet with success.

International protection

Many Israeli designers would be only too happy to protect their designs worldwide. To date, they have no choice but to file an application in each country in which they seek protection. The Design Bill offers a beacon of hope for the design community—the law may enable Israel to join the Hague Agreement, an international arrangement enabling international applications to be filed for designs protection in all contracting states.

Filing the application is relatively simple, and involves filling out a single Internet form and paying a filing fee in all the countries in which protection is sought—a single payment, in a single currency. The registration process is generally swift in light of the fact that most countries states do not verify that the design is new at the time of registration. For years, the Hague Agreement suffered from low membership (62 member states in 2014, compared with 148 in the corresponding arrangement for filing international patent applications (PCT)). However, in 2015, a number of countries joined the agreement; several new members are likely to be of special interest to Israeli designers, including the U.S. and Japan (two examining countries, like Israel). China is also forecasted to join the Hague Agreement in the near future, which will make it easier for Israeli designers to protect their designs in this major market.

1. The explanatory notes to The 2005 Copyright Act, Bill 196, P1116
2. The Copyright Act (2007) § 1 Literary works include computer software
3. The Copyright Act (2007) § 11(1)
4. The Copyright Act (2007) § 11(5) and 15
5. WiseCom Communication Solutions v. Tel-Yad Excellence Ltd., and others, Civil Case 2042-08, Par' 31, P26
6. The Copyright Act (2007) § 48
7. WiseCom Communication Solution v. Tel-Yad Excellence Ltd., and others, Civil Case 2042-08, Par' 31, P25
8. Tony Greenman, Copyright, "Green Man" Edition, 2009 (second edition), P669-670
9. THE DIGITAL MILENNIUM COPYRIGHT ACT (DMCA)
10. Hemda Gilad v. Netvision Inc., Civil Case 1559/05, P5
11. N.M.C. United Entertainment Inc. v. Bloomberg Inc., and others, Civil Case 33227-11-13
12. ZIRA (Copyright in the Internet) Inc. v. Anonymous, and others, Civil Case 37039-05-15
13. Rami Mori v. Barak A. T. C. [1995] Bezeq International Inc., Civil Case 4447/07
14. ZIRA (Copyright in the Internet) Inc. v. Anonymous, and others, Civil Case 5535/15
15. Article 5(b) Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society



CHAPTER 8

Recommendations and conclusions



Israel's intellectual property regime has undergone favorable changes in recent years, but there are some persistent lacunae. Israel must prioritize intellectual property on the national agenda and allocate the proper resources to tackle violations on a scale befitting one of the world's leading technology-oriented economies.

Another important aspect of intellectual property is the untapped potential of the intellectual assets held by the State. On this count, the only remedy is to locate and identify the intangible assets that have economic potential and promote their commercial leverage.

So what do we need to do?

On the legal level—dealing with intellectual property laws differs from other disciplines heard by the courts, since it necessitates delving into scientific and technical topics as well as extensive judicial experience. The legal system must create a new culture where the State Prosecutor, the plaintiffs' attorneys, and the judges themselves “live” the subject of intellectual property and follow a clear policy intended to promote its protection. The policy must be jointly defined by the Ministry of Justice and the judicial system. As a crucial part of this process, we must raise awareness among judges with the aid of regular seminars on the subject and promote the training and appointment of judges qualified to arbitrate in intellectual property cases.

It is also imperative to strengthen the internal systems that grant rights in intellectual property (especially patents, trademarks and design) in order to encourage the public to take advantage of the legal tools at their disposal.

At the same time, action is required on the legislative level to ensure the ongoing revision of intellectual property legislation with the participation of the rights proprietors, especially in connection with the problematic laws mentioned in this report. Proceedings in investigation cases and the filing of indictments against rights infringers must be expedited (by the State Attorney's Office), including by invoking the Money Laundering Law.

Strengthening the enforcement system - The enforcement system requires additional manpower and tools—essential ingredients in any

successful reform. Legislation should support the enforcement system with stiffer criminal sanctions. Japan and the U.S. have carried out successful reforms on this front both internally and in their dealings with other countries.

Proper enforcement cannot take place in a bubble. To prevent the import of counterfeit goods, cooperative mechanisms must be forged with other countries, legislation of trade agreements relating directly to intellectual property will require dedicated advocates, and we must join international treaties that relate to inter-state cooperation, create an extra-territorial enforcement system, and foster intimate cooperation with the Customs Authority.

It is plain that without an effective and aggressive enforcement system there can be no improvement in the situation as is today. Therefore, we recommend the following provisions:

- Subordinating all policemen in the districts to the national intellectual property unit and treating the unit as one combating economic crime.
- Allocating additional positions to the national intellectual property unit.
- Hastening the issuing of indictments, implementing the Arrest Law and creating a professional framework within the Police of prosecutors to deal with indictments relating to the matter and handle intellectual property cases.
- Increasing cooperation among municipal police stations on enforcement and as part of this, increasing the frequency of raids on channels of counterfeit goods.
- Collaborating with police forces in other countries.
- Allocating manpower to deal with the transfer of counterfeit goods from the Palestinian Authority areas.
- Setting up a collaborative mechanism with all enforcement agencies (Income Tax Authority, VAT, the Ministry of Economics and Trade and copyright proprietors)
- Allocating resources as part of the State budget and funding for at least 75 positions in the special police unit.
- Instructing the Income Tax Authority and VAT to increase preventive efforts and enforcement of prohibitions against the import of counterfeit goods via the ports using existing means and by the addition of new ones.

- Using Ministry of economics, Trade and Employment inspectors to check businesses and markets and exercise their authorities, including confiscating goods and imposing fines.
- Integrating the Tax Authority in the overall activity and reviewing the issue as part of income tax audits of businesses known to be involved in producing, marketing and selling counterfeit goods in Israel.
- Regulating the phenomenon of photocopying and duplicating books in the possession of educational institutions, which today are deemed a copyright infringement, and payment of royalties for using them.

Learn from global experience - Violating intellectual property rights is no different from stealing any other kind of property. The fact that this does not involve the actual physical taking of an object but the production of a counterfeit product or a copy or a software download does not detract from the severity of the misdeed. Sometimes extensive information campaigns are necessary, such as the one undertaken by the Business Software Alliance (BSA) in order to convey a clear message to the public regarding the serious nature of the misdeeds. Criminal sanctions should be broad and enable trying anyone who is part of the chain of infringements, from the importer and storage people to the distributors and in extreme cases, the users (whether it is companies or individual people). Intellectual property infringements are easy to commit, and sometimes even a tempting possibility. Without a strong and determined criminal enforcement system backed by a civil system that guarantees a golden path to compensation for those affected, it will not be possible to combat this problem.

England provides a good example for enhancing enforcement. After adopting the European Directive in 2004, it set up National IP Crime Strategy Committee (2004), headed by the English Patent Office, a committee tasked with addressing criminal cases involving intellectual property infringements. The committee's work led to the conclusion that in order to combat counterfeit and pirate copies, it is extremely important to set up an intelligence arm that will coordinate the information coming in from the different law enforcement agencies overseeing import methods, manufacturing, transport and storage of counterfeit intellectual property goods. Hence the Tellpat Intelligence Database was set up under the auspices of the British Patent Office, which oversees all information the authorities have on intellectual property infringements. Notably, the British committee, like its counterparts in the U.S. and Japan, also publishes an annual report describing the achievements relating to enforcement in England during the preceding year.

Education and information - We can learn from the experience of the U.S. and Japan, two countries that worked to encourage the creation of intellectual property in academic institutions and in national research institutes, offering incentives sometimes subsidized by the government and with greater cooperation among the research institutes themselves. At the same time, an educational program was launched, distributed information, and increased awareness of the importance of creating and protecting original work. The applicable lessons derived from these programs are the fundamental cooperation with local industry, government-backed encouragement of education on the subject, and an institutional war against violations.

Of no less importance than legal changes is working towards a shift in public awareness to promote mindfulness about safeguarding copyright in Israel and the necessity of avoiding participation in the illegal enterprise. In addition, the government should work to make lessons on intellectual property and sensible consumer habits part of our schools' curriculum, and to increase awareness of this subject among teaching staff.

Balance between short - and long-term needs - The U.S., Japan and European Union countries are contending, as are many countries around the world, with limited resources in the public sector. However, budgetary concerns do not lead these countries to favor short-term goals, such as expropriation of intellectual property rights and supplying equipment and information to the public for a reduced price. These countries understood the importance of, and implemented policies with a balance between innovation and access.

Coordination of government activities - Until there is a decision to set up a central body to be responsible for promoting the issue of intellectual property protection in Israel, the matter must remain the province of various government ministries. Therefore, during the first stage, it is advisable that the prime minister should act immediately to form a ministerial committee headed by the Minister of Justice. This will be a committee to prepare an operating plan and guide the various government offices in order to streamline and focus the advancement of these issues. To do so, the committee can look at reforms already instituted in other places around the world

Missed opportunities: leveraging existing intellectual property assets - The financial losses due to the improper handling of intellectual property do not simply end in the area of counterfeits and duplications, but also extend to the lack of sufficient leverage for intellectual property owned by the state. The State Comptroller already noted shortcomings in the work of the university technology transfer companies. The Finance Ministry's accountant general has already warned that the State is not doing enough to promote the intellectual property found in government hospitals. An internal report by the defense establishment (the Tishler Committee) determined that the State is not doing enough to leverage the intellectual property being created within the walls of Israel Defense Authority.



SUMMARY

Israel took upon itself many international commitments in the realm of intellectual property protection (international treaties, trade agreements, adapting OECD standards). It is in the process of constant improvement. However, in certain areas, such as counterfeit drugs, goods and brand name items, as well as in all matters relating to international standards regarding patents for drugs and in the life science industry, more work is needed in order to “fall into line” with the world’s advanced countries.

The losses from intellectual property violation are felt throughout the economy—lost sales for industry and businesses, lost taxes for the state, blows to consumers, negative incentive for development and innovation, impaired health (due to counterfeit drugs, for example), damage to the normal economic fabric of the country, the development of organized crime and negative employment impacts. In addition, Israel is missing the business potential contained in the leveraging of intellectual property found inside the walls of academia, government hospitals and the defense industry.

If Israel is to maintain its status as a leader in the technology and business fields, it must vigilantly protect intellectual property rights. Since its economy is party to a network of foreign trade agreements, it cannot permit such damage to intellectual property rights. The Israeli Government must be proactive and take vigorous steps that will fundamentally change the public’s attitude and the official view of intellectual property products. Such action will contribute to Israel’s economy and to the country’s international standing.

Israel must work to bolster the high-tech industry which has begun show cracks in its arm of late. The problem is two-fold: we are experiencing a severe shortage of engineers to usher in the next generation of innovation at the same time that the financial infrastructure that supported the high-tech industry to this point is beginning to falter.

As far as technology education goes, the plan for strengthening the study of mathematics is a step in the right direction—but it is not a magic bullet for the long-term problems facing the high-tech industry and Israel as a whole. The government must address the entire spectrum of science and technology education and initiate a plan that straddles the school and professional careers of our future innovators—starting in elementary school and continuing beyond placement in technology companies—in order to ensure that Israel’s most pressure resource, its indefatigable human capital, continues to produce cutting-edge intellectual assets.

