# SECTION THREE: ANALYZING ISRAEL'S POSSIBILITIES FOR ACTION

In the previous chapter, we discussed considerations that are meant to encourage decision-makers in Israel when planning a technology strategy and to examine investment in local technology production systems. In this section, we describe the current Israeli situation in the systemic context and the "displacement" that it is in. This section brings together the insights presented so far in a way that allows for discussing policy alternatives. The alternatives will be presented via the SWOT model, which helped us highlight the advantages and disadvantages of each alternative.<sup>86</sup>

As part of writing this section, we interviewed leading figures in the tech industry in Israel. We encountered consensus regarding the recommended technology policy from their perspective.<sup>87</sup> Their insights and their position with respect to policy will be presented as part of the systemic analysis and alternatives.

## Is Israel Operating According to a Technology Strategy?

Before presenting the systemic analysis and the alternatives, we would like to argue that despite all of Israel's technological achievements presented in the previous section, Israel is not currently operating according to a sustainable technology strategy. This does not mean that the government is not investing in technology, but rather the current policy, which is expressed in minimal public investment (9.6% of the spending on R&D is governmental, last place among the OECD countries for 2019) and in encouraging the private sector via tax benefits and grants, does not ensure that the Israeli economy will continue to enjoy the fruits of the tech industry over time.

This policy of providing tax benefits and grants is enshrined in the Law for the Encouragement of Industrial Research and Development that was passed in 1984, and in the same framework, the Office of the Chief Scientist became

NATIONAL TECHNOLOGY PLAN IN ISRAEL / ARIEL SOBELMAN AND T.Z.

the Innovation Authority in 2015.<sup>88</sup> According to the wording of the law, the Innovation Authority is responsible for encouraging, advancing, supporting, and assisting technological innovation in industry, and for developing the infrastructure necessary for this, including by providing benefits, which are grants, loans, exemptions, discounts, tax breaks, guarantees, and other means of assistance, aside from the acquisition of stocks. The Innovation Authority is obligated to operate in accordance with government decisions in its regard, and according to the policy of the Minister of Innovation, Science, and Technology when lacking a government decision.

Unlike the state budget, which is anchored in legislation, the benefit tracks published by the Innovation Authority are subject to government decisions and are taken from the budget of the Innovation Authority or government ministries. Since their standing is different from that of a law legislated by the Knesset, these tracks can be changed and cancelled. Except for the law that grants the Innovation Authority its powers, there are no laws in Israel that enshrine public investments in the research, development, and production of technology or clear indices and monitoring for the purpose of maintaining Israel's advanced standing in the world. This method of operation of the Innovation Authority is intended to finance the risk of Israeli entrepreneurs who are interested in investing in channels that will ultimately be translated into economic growth; however, in recent years and all the more so since the intellectual property policy changed and the process of mergers and acquisitions by multinational companies became easier, the Israeli economy has not benefitted from the full potential of the tech sector. This is because the Innovation Authority's mode of operation incentivizes the aspiration for an "exit"-the purchase of the asset by a larger company, usually a foreign one. In most cases, the exit is done with meticulous tax planning that deprives the state of significant income from the acquisition itself. In many cases, the acquisition leads to the establishment of a development center in Israel that employs workers, while in other cases, sometimes in a long and gradual process, the acquiring company disconnects from its Israeli roots and most of the workers and assets move abroad. One way or the other, the main compensation to the state is in the form of employment taxes by those employed in the company. If there were a policy that aspired to leverage Israeli intellectual property also for the purpose of state royalties for its investments in start-up companies, a business culture would presumably develop that would encourage companies to grow in Israel and become operational companies and not only aspire for an exit.

A report by the Innovation Authority for 2022 warned the government against "complacency and an expectation that without long-term investments, the economy's main export industry (high-tech) will continue to lead in the global arena," and provided the figures of the global innovation index and the strength of academia as warning signs regarding continuing the current approach. This determination by the Innovation Authority is also true of the entire tech industry in Israel, and not only of the high-tech software and services sector, which comprises the majority of current investments. Furthermore, given the global changes detailed at length, it is evident that the competition Israel faces in the technology market has become increasingly tough, in a way that does not enable the private sector to compete without public support and a stable long-term policy.

## Systemic Analysis: The Context in which Israel Operates

For the purpose of this discussion, the global context in which Israel operates is a complex system of civil, economic, social, technological, and military interrelations. From this context, we reached four conclusions that focus on the technological context of the global order as it is currently being shaped. Each conclusion has challenges and opportunities for Israel:

1. **The "blue camp" versus the "red camp"**—When it comes to technology, the "blue camp" led by the United States is expanding and slowly taking form as a "democratic technological alliance." The shape in which the alliance is emerging is not yet clear, but its strategic purpose is to maintain the position of the United States as the strongest power and to place pressure on the "red camp" led by China. The "red camp" represents the camp opposed to the alliance of democracies. Israel is closer to the "blue camp" in the technological context, but it is not yet considered a full partner in the "chip alliance," whether due to its intentionally refraining from making declarations on the issue, or because an in-depth discussion has not yet taken place on the consequences, nor in other initiatives led by the United States whose goal is management and control of global technology resources. Should Israel seek to officially join the "chip alliance," it will need to clearly declare its positions regarding the "red camp" and to comply with restrictions as they are expressed in legislation (for example, it is possible that Intel will choose not to export chips produced in Israel to China). In this sense, Israel will become an active partner in the technological arms race that the United States is leading against China, but it will be able to join international initiatives in the fields of regulating artificial intelligence and protecting privacy and human rights, and to benefit from the economic opportunities that will open up for Israeli industry. Although the use of the image of the blue camp is not suitable for describing all the relations in the world, it is worth noting that there are many gray areas in relations between the great powers, and it appears that the dichotomy is easier to identify and characterize in the technological field. Considering the huge scope of investment and the means of monitoring and supervising the proliferation and leakage of technology, here we can actually see a clear division into camps, with very few gray areas.

2. **The chip alliance's branch in Asia is a growing and expanding market**— Taiwan, Japan, and India have officially declared that they are joining the chip alliance. Japan, already perceived as a technological development and production power, declared its intention to stop its trade of advanced technology with China and is expected to benefit from the fruits of American investment. China signed a memorandum of understanding with the United States and is going to invest a fortune in subsidizing and establishing chip factories in its territory. Taiwan relies on its relations with the United States for defense against the threat of Chinese invasion, but it is evident that it has not yet formulated a strategy that will allow it to transfer part of its technological production capabilities to the United States without undermining its stability. Israel, as a research and development power, faces a strategic opportunity to examine a strategy similar to that of Japan and India, albeit at a smaller scale given resource limitations. The way that Israel is encouraging Intel to establish an additional chip factory in Kirvat Gat is a right step in this direction, but it is not enough. Israel must examine how it can encourage other chip companies to establish factories (TSMC, for example) and ensure that its export policy matches the interests of the entire supply chain. It is important to note that the chip industry is not built only on the silicon factories alone, but also on packaging, assembly, testing, and quality control companies. The costs of the factories that complement a chip factory are immeasurably lower, and the State of Israel should incentivize companies in the field to come to Israel. In this context, Israel should strengthen its partnership with India and Japan, both of which are significant players in the field, and examine the supply chains of critical technology.

3. The Middle East as an arena of struggle between the great powers and the important role of Israel with respect to the United States—The current US strategy expresses the American focus on domestic affairs, whereas the CHIPS Act and the "chip alliance" aim, first and foremost, to serve the needs of the United States. The United States does not at present maintain technological partnerships in the region, and China is exploiting the current American focus as an opportunity to strengthen its relations with Saudi Arabia and the Gulf countries, including intervening in resolving internal conflicts in the region, in particular the conflict between Saudi Arabia and Iran. Israel has an important role in maintaining American interests in the region, and it can be a "blue camp" bridge to the region when it comes to advanced technology, under American patronage. Israel can host a "chip alliance" of Middle Eastern countries, contribute from the considerable knowledge that it has accumulated on chip research and development, and support the establishment of chip factories in the Gulf, out of considerations of redundancy and creating strategic alliances of supply chains that are not dependent on China. From a strategic perspective, combining the tremendous financial strength of the Gulf countries with Israel's groundbreaking technological innovation generates unprecedented opportunities to jointly invest in chip technologies that were beyond Israel's economic capability and beyond the engineering resources of the Gulf countries.

4. Technology as a tool for resolving the internal tension and security challenges of Israel—Israel's internal struggle, including the comprehensive judicial reform being advanced by the government and the ongoing decline of national investment in academia, affect the ability to lead innovation. In addition, Israel is still subject to security threats that demand attention and resources. A national technology plan could simultaneously be a solution to these two challenges. In the external environment, a national technological plan would ensure Israel's position as a technological power and maintain its military partnerships in the world, while in the internal environment, it could enable the narrowing of gaps, increase participation, and strengthen cohesion in a way that would allow for the restoring investments in security needs over time.

#### **Describing Israel's Displacement**

Addressing the conclusions of the systemic analysis provided below, we would like to apply a model developed by Dr. Zvi Lanir in his book *Fundamental Surprise*, published in 1983, and to point out that Israel has been displaced.<sup>89</sup> While Israel sees itself continuing to develop as a leading innovative and entrepreneurial country in high-tech on an international level, in practice, the supply chain crisis and the worsening conflict between the United States and China have led to a reorganization of the technological arena that challenges the current strategy. While countries that aspire to strengthen their technological industries are advancing legislation and investing a fortune in the field of production and hardware, Israel has not yet formulated a comprehensive strategy on the matter, which could lead to a decline in its comparative advantage over time. The current focus on the services economy is exacerbating the polarization and deepening the gaps in a way that erodes human capital.

The turning point that changed the world's approach is the supply chain crisis. In Israel too, the intensity of the crisis was felt, but the crisis was not conceptualized in the Israeli discourse and in its unique contexts for the local high-tech industry. Israel is part of the global supply chain and when there is a disruption or failure at a certain point in the chain, it is the state's responsibility to implement changes or adjustments at the economic or geopolitical level in order to minimize the damage or to exploit opportunities to advance the country's interests. Still, an institutional discussion has not yet taken place on the challenges and opportunities created by the crisis, and the steps needed for strengthening the economy have not yet been taken. If Israel chooses to continue the current strategy, refrain from direct intervention in the industry, and focus on research and development, it could find itself reaching the limits of its innovation strategy. This is for the simple reason that in the face of the enormous government investments around the world and the investment in an industrial policy of greater self-reliance, Israel could find that its competitive ability has eroded. Unlike Israel, its competitors in the world are now working to advance legislation and to expand investment channels in a way that will enable them to cope with a reality of reduced trade in advanced hardware (a trend that is already being felt given the struggle between the United States and China), through government subsidies to create a better balance between research and development and production capabilities, in a way that will maintain their technological and economic stability.



# FIGURE 17. BASIC SURPRISE IN THE SUPPLY CHAIN CRISIS

## Alternatives for Policy and Strategy in Technology

*Option A: Evolutionary Development—Continued Investment in Innovation-Oriented "High-Tech" (software and services)* 

The first option is one in which the state is not expected to invest further resources in technology beyond its current investments and, in effect, continues the current situation. In addition, there is no declared or practical national intention to participate in the "chip alliance." In this scenario, the focus will be directed at maintaining Israel's appeal: Human capital that encourages multinational companies to establish R&D centers in Israel, alongside tax benefits that alleviate operational costs.

Implementing this option, while ignoring the emerging trends in the global technology market, would increase the risk of brain drain from Israel, given the increasing competition with the United States and Europe and the incentives that they are expected to offer in return for moving R&D centers close to production plants in their territory. In-depth interviews with heads and leaders of the tech industry in Israel also revealed that given both the crisis taking place among the tech giants in the world and the forecasts that this crisis will continue in the coming years, the volume of foreign investment in Israel, which propels the local industry, is expected to decline. In addition, if the pressure increases on Israel to adopt a stance on the global technological struggle, it is possible that Israel will not be able to implement this option without endangering foreign investment or risking its place in the global supply chain.

In his book *Strategy: The Logic of War and Peace*, Professor Edward Luttwak describes the paradoxical nature of every strategy and warns of a situation in which continued implementation of an existing strategy will reach its limits, which could become a barrier to achieving national objectives.<sup>90</sup> This is the main weakness of this option. While it expresses the strengths of the Israeli economy as presented in Figure 18, it does not allow for coping with the weaknesses, which could cause the Israeli tech sector to deteriorate in the long term.

# FIGURE 18. POLICY ALTERNATIVE - OPTION A



# *Option B: Maintaining the Existing Model—But Changing the Focus—Investment Adapted to Trends in the International Arena*

The second option (see Figure 19) is similar to the first in the sense that the state is not expected to invest further resources in technology, or to declare an official intention to take part in the "chip alliance." However, in this option, the state would focus and direct the private sector toward opportunities in the global market, particularly new investment channels in the field of technological production, to encourage multinational companies to set up factories and establish themselves in Israel.

At first glance, it might appear that the difference between this alternative and the first is semantic, but this alternative incorporates Israel's strengths while it maintains a liberal environment for an independent private sector that leads the economy. In return for the incentives and tax benefits that are in place today, Israeli entrepreneurs would be able to establish R&D centers that would attract the production giants to Israel. This alternative could also encourage the development of business opportunities with hardware companies abroad to consider establishing factories in Israel, given an explicit statement by the Israeli government that this is its aspiration, and it would support and incentivize such initiatives. At the same time, this option does not necessarily address the weaknesses of the Israeli economy, particularly regarding academia and the scope of participation among Arabs and ultra-Orthodox in this technological workforce. This option could be difficult to implement if the State of Israel does not carry out the necessary investments in technological education from a young age to ensure the training of a suitable labor force. Similar to the cyber industry, the human reserve in this industry develops from a young age by providing after-school activities for youth and cyber studies in high schools, offering the initial knowledge foundation that young people have when they enlist in the army, where their knowledge develops in an efficient and focused manner.

The majority of interviewees, all leaders in the Israeli tech industry, expressed support for this option because it preserves the Israeli ecosystem—the young minds who lead the research and development in a way that attracts investors throughout the world. In addition, Israeli entrepreneurs assume that given resource limitations, Israel will choose not to invest in setting up production plants, and therefore, there is no point in government intervention, except for the incentives currently offered. In this sense, the interviewees indicated this possibility as the most realistic option to implement.

The main difficulty in implementing this option is that investment in the technological production industry involves high initial costs, investment in infrastructure, education, academia, and training of a workforce. This is a project that is difficult to pursue without government intervention, and, in effect, this is also the main reason that there are no private initiatives in Israel in the field of technological production. Furthermore, the United States poses an external challenge in implementing this option, as it is expected to

create difficulties in providing incentives and benefits as part of the CHIPS Act without the provision of a commitment on a national scale (transparency regarding relations with China, for example, would be a basic condition in any negotiations).

In practice, choosing this option without government intervention beyond what exists today would ultimately mean that this option would not be implemented due to the limitations of the market as they are expressed today.

#### FIGURE 19. POLICY ALTERNATIVE - OPTION B



*Option C: Enshrining in Legislation Government Investment in Technology and Establishing a Public Investment Fund* 

The third option (see Figure 20) aims to address the limitations of the second option and to propose government intervention to facilitate new investment channels to enter the technology market, particularly in the production of advanced technology. In this option, Israel aligns with the dominant trend of

the most advanced countries in leading the tech powers and understands that the only way "to break the linearity" of technological innovation is through government intervention, and consequently it must formulate a national plan and long-term objectives. This trend has been adopted by a wide variety of countries, some of them the size of Israel, and that have similar economic characteristics, such as the Netherlands and Ireland. In this option, the Israel Innovation Authority, under the direction of the government, would focus on fulfilling the objective of increasing production in Israel. The Israel Innovation Authority would receive an increased budget and powers to fulfill these objectives, via existing tools (tax breaks and incentives), in addition to defining a national policy for investment in start-up companies in order to direct and encourage entrepreneurs to establish companies in specific fields. This is in contrast with the current situation, in which the investment arm of the Innovation Authority operates like a venture capital fund and directs its investments based on return-on-investment forecasts. The role of the Innovation Authority is critical and would be in addition to national investment in infrastructure and in human capital via the university education system and special placement processes for the relevant professions. Furthermore, through diplomatic initiatives, the Israeli government could promote a capitalengineering partnership with the Gulf countries and others, which would increase the production footprint in both Israel and the region, and thus contribute to strengthening the partnership between the countries.

This option challenges Israel with a high initial investment, and in defining objectives that could be perceived as an "industrial policy" that imposes a framework and limitations on the private sector in ways that are incompatible with the current comparative advantage. In certain ways, this option forces the Israeli tech industry to undergo a process of maturation, beginning with the stage of almost entirely exploiting opportunities—"riding the waves"—to more orderly defining of policy and objectives for the development of the industry and economy. To understand the scale of the inputs needed, in the

United States, the CHIPS Act allocates about \$270 billion, whereas about 53 billion are intended for direct subsidies for the construction of chip factories or factories related to the value chain of chips (packaging, assembly, and testing). The European Union has allocated about €43 billion toward the same goal. Of course, the Israeli economy cannot allocate such sums, but a gradual definition of objectives, fully embracing the private sector (both in defining objectives and in investments), and possibly also partnerships with the Gulf countries would enable Israel to maintain its strengths and its appeal among investors and also to develop the local hardware industry. Since Israel competes in this field with great powers that invest enormous sums of money, it is likely that Israel would not be able to implement this option without the support of the United States, backing from Europe, and investment from additional countries. Declaring a national plan that aligns with the American strategy is likely to enable this support.

In the past year, despite serious shocks in both international markets and in Israel's business and corporate climate, Israel's comparative advantages in chip engineering continue to appeal to multinational companies in the field. Intel announced the expansion and upgrading of its factories in Israel, along with Nvidia, which is developing its production infrastructure based on the acquisition of Mellanox Technologies. In this option, with the right investment by the Israeli government, it is possible to incentivize companies throughout the hardware value chain to establish a presence in Israel. Because Israel is interested in solidifying and improving its standing in the global supply chain, and because chip production plants are not necessarily the most lucrative investment channel, other investment directions can be examined in the field of technological production, such as incentivizing support industries to set up factories in Israel, such as for chip packaging factories or chip testing equipment.

# FIGURE 20. POLICY ALTERNATIVE – OPTION C



*Option D (risky): A Process of Anti-Globalization and Complete Self-Reliance* The fourth option (see Figure 21) is presented for the purpose of mthodological reasons in using the SWOT model. While this alternative is not feasible, it is presented mainly to illustrate the enormous difficulties of an anti-coalition policy that relies on complete autonomous production capability. Underlying this option is the assumption that Israel is forced to invest resources in order to build independent technological production capabilities for national security purposes. Several countries in the world are coping with almost complete self-reliance due to geopolitical circumstances or intentional isolation. Technological isolation could develop over time as a result of losing Israel's place and standing among the technologically advanced democratic countries.

# FIGURE 21. POLICY ALTERNATIVE – OPTION D

