EXECUTIVE SUMMARY

Globalization is one of the most significant phenomena of history and has been an irrefutable axiom since World War II. Today it is difficult to imagine how either individuals or countries could survive without international partnership and movement of goods. However, since the outbreak of the COVID-19 pandemic and the supply chain crisis that followed cracks have become obvious in the principles of global trade, and one of its clearest manifestations is the Great Power technological competition between the United States and China.

During the past decade China has expressed its ambition to lead the most advanced technological production industry in the world. Its thirteenth Five-Year Plan, "Made in China 2025," publicized a national project aiming to reduce Chinese dependence on the United States by 2030. China seeks to exploit the principles of "free trade" and globalization to import the best brains and establish local industries producing advanced semiconductors or chips, which would strengthen research and development of artificial intelligence capabilities. At the same time, the global spread of the COVID-19 pandemic demonstrated to the West the risk of dependence on supply chains originating in Asia and the need to create a local alternative that will ensure independence and access to technology vital to national security.

President Joe Biden's election campaign emphasized that fortifying the US global standing and strengthening the economy is predicated on repatriating large swathes of global technological production to American control and on American soil. The United States intensified its efforts to deny China's access to advanced technologies. In October 2022, the United States passed the CHIPS and Science Act, which includes a budgetary investment of $278.2 billion over ten years for the acceleration of technological research and development, thus ensuring the US position as the strongest economic power in the world. Out of this total, $52 billion was allocated to subsidizing the establishment of

semiconductor manufacturing plants on US territory. In this step, the United States expressed a preference for security and political considerations over economic considerations and global free trade.

This legislation is creating a post-global reality, returning to alliances and coalition-based models. Each country (in effect, each company) must reexamine its partnerships and the partner companies in its supply chain in order to avoid American sanctions. Moreover, the United States has also turned to its partners in Asia and Europe and has attempted to convince them to join this effort to restrict China's ability to research, develop, and produce advanced chips. This could be a hard pill to swallow: These partners could face a high cost, not only economically, but also in other national aspects, given China's economic standing and its growing ties with Asia and Europe.

The US approach is controversial among liberal-democratic regimes. In capitalist countries, states generally prefer either to fund initial investment in research and development or to back the risk in order to encourage private entrepreneurs and investors to join these ventures; over the years these regimes have reduced their involvement and investments in most industries, choosing to offer stimulus in the form of tax and customs subsidies. The Israeli technology market and high-tech sector are a good illustration of the advantages of this approach. However, one reason for this success is that Israeli high-tech is primarily focused on a relatively limited variety of fields based on software, which does not require a high government investment in research and development. Not withstanding the value and importance of Israel's defense industries and of the lion's share of start-up companies, this model is not sustainable given the current pace of technological advances in hardware. It is this hardware that is now the basis for the entire industry. Furthermore, it is already apparent that Israel's standing as an innovative country, able to absorb future technologies, has already declined.

Israel is known as one of the most innovative countries in the world and as a center of high-tech entrepreneurship. The high-tech sector includes research

and development in an enormous range of fields, as well as a manufacturing sector (electronics, biotechnology) and industries associated with the services sector (computer programming, information security, artificial intelligence). In 1984, the Israeli Parliament passed the Law for the Encouragement of Industrial Research and Development, under whose aegis the Israel Innovation Authority was formed and has operated to this day. The funds established in those years are providing today's grant incentives for funding research and development in groundbreaking ventures. One of the main achievements of government intervention at that time was the establishment of a 100-million-dollar government investment fund named the Initiative Program. From the government's perspective, this fund was, in fact, the inspiration for additional private funds, established to encourage and enable Israeli companies to operate in the ever-increasingly high-risk technological environment. Israeli success stories in technological innovation attracted multi-national corporations to set up research and development centers in Israel that relied on and recruited top-notch engineers. A three-way relationship and interdependency evolved between scientists, entrepreneurs, and foreign investors that would become a prerequisite for advancing the economy.

In the early 2000s, the prohibition on expatriating intellectual property outside of the country was eased, thus reducing the de facto obligation to produce and manufacture in Israel. This change was the result of a struggle led by venture capital funds in Israel, who protested that the export restrictions deterred foreign investors and stifled the growth of start-up companies. Venture capital fund believed that a "free market" was a necessary condition for growth, and removing the intellectual property transfer restrictions would enable massive injection of foreign capital that would propel the economy's growth. However, this very change also entailed harm to the overall national interest, as it effectively weakened the government's ability to manage other critical national assets, including ones that were part of assuring Israel's social and demographic fabric. Manufacturers' unions warned of the potential

harm, and the original restrictions themselves ended up morphing into a system of fines and penalties to companies that chose to transfer ownership of their intellectual property. The system failed to deter entrepreneurs, who simply calculated the included fine in the gross cost of the sale or generated alternative financial mechanisms to circumvent the restrictions or to offset any penalties against other investments.

The expansion of foreign investment led to Israel's growing ever stronger and emerging as a technological powerhouse and a globally-admired international start-up incubator. Israeli human capital reached historic breakthroughs and propelled the industry to unprecedented achievements and financial yields. However, according to figures published by the Israel Innovation Authority in its 2022 report, it seems that we are in the middle of a concerning change in the trend. Despite the record highs attained in recent years for the State of Israel (including a record $27 billion of capital raised, 40 Israeli companies crossing the $1 billion value threshold, and 75 Israeli companies that have gone public), this is not sufficient for ensuring continued global leadership and the growth of the technology industry. We are witnessing that technology itself is generating and accelerating global changes. Keeping up with this accelerated pace of development requires enormous investments, and the global balance of power fluctuates in such a way that those countries that are able to keep up with the pace and cost of research and development increase their prominence and become influential global powers. Nations that are unable or fail to invest the necessary capital to promote innovation fall behind economically, socially, and militarily.

Investment in research and development in emerging production technologies is a crucial element and affords Israel a relative advantage, but it is only a partial solution to the problem. Israel needs a national plan that addresses industrial planning aspects across the full value chain of development, production, and trade of chips. Government guidance and leadership is of paramount importance for incentivizing participation and

competition. It may also motivate entrepreneurs in Israel and abroad to commit the initial investments of the billions of dollars, required for establishing a manufacturing infrastructure foundation. Advanced and sustainable technology is dependent on infrastructure development, education, foreign policy, and a defense framework.

The chip supply chain crisis marked the turning point that changed the world's attitude. Although the intensity of the crisis was felt in Israel too, it was not properly conceptualized, neither in the Israeli public and policy discourse nor in the unique context of the local high-tech industry. Israel clearly is an integral part of the global supply chain, and when this chain experiences disruption or failure in one of its links, it is the state's responsibility to identify and make economic or geopolitical adaptations needed to minimize the potential harm or to leverage emerging opportunities to advance the country's interests.

In this memorandum, we apply a methodological model developed by Dr. Zvi Lanir in his book *Fundamental Surprise: The National Intelligence Crisis*, which was published in 1983, to pinpoint the strategic displacement we believe Israel is currently in. While Israel views its trajectory as continuing to develop as a leading innovative and entrepreneurial nation in the high-tech industry on an international scale, in practice, the supply chain crisis and the escalating conflict between the United States and China have led to a reorganization of the technological arena in a way that challenges this strategic assumption. Nations striving to strengthen their technological industries are passing legislation, accompanied by unprecedented investments of public funds in production and hardware. To date, Israel has not yet formulated a comprehensive policy on the issue. This lack of strategy could lead to the deterioration of its qualitative advantage over time. The current disproportionate predominance of the technological services industry intensifies the polarization and deepens the gaps by effectively channeling young Israeli talent toward the software industry in a way that could, over time, erode Israel's human capital advantage.

If Israel elects to continue the current strategy, refraining from any direct industry intervention, while prioritizing focus on research and development, it risks reaching the limit and exhausting the effectiveness of its technological innovation strategy. This could happen for the simple reason that in light of the enormous government investments worldwide and a strong global trend of shifting to industrial policies of greater self-reliance, Israel may realize that its competitiveness has eroded. Unlike Israel, competing countries are currently advancing legislation and expanding available channels of investment to cope with an emerging reality of reduced trade in advanced hardware (a trend that is already being felt due to 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 maintains their technological and economic stability.

This memorandum presents an alternative for Israel's technological policy and recommends that Israel align itself with the dominant trend among the most advanced countries, led by the technological powers. Government intervention, to a degree, is the only way forward to "breaking the linearity" of technological innovation. Consequently, it is imperative to formulate long-term goals and a "national plan." This strategy has been adopted by several countries, some the size of Israel and with similar economic characteristics, like the Netherlands and Ireland. In this alternative, the Innovation Authority, directed by the government, would focus on increasing production in Israel and would receive an increased budget and authority to fulfill these objectives, leveraging existing tools (tax breaks and incentives). The Authority would define a national policy for investment in start-up companies, so as to provide guidance and incentives to entrepreneurs to incorporate new companies in the prioritized and desired fields. This is unlike the present situation in which the investment arm of the Innovation Authority operates, in effect, as a venture capital fund, directing its investments based on return-on-investment projections. The role of the Innovation Authority is critical and

must be coupled with national investment in infrastructure and human capital, through the university education system and unique processes of placement in the relevant professions. Moreover, in this alternative, the Israeli government, through diplomatic initiatives, would pursue economic partnerships with the Gulf states and others to create a capital-engineering collaboration, thus increasing the production footprint in both Israel and the region and strengthening the ties between these countries.

This alternative challenges Israel to infuse a high initial investment and define objectives that could be perceived as an "industrial policy," imposing both a framework as well as limitations on the private sector, perhaps reminiscent of less liberal economic systems that could follow paths that are not as compatible with the current comparative advantage. To an extent, this alternative would force the Israeli tech industry into a process of maturing, from one based almost entirely on exploiting opportunities and trends—"riding the waves"— into following a more orderly definition of policy and objectives for developing the industry and economy of the chip value chain (packaging, assembly, and testing). The European Union allocates about €43 billion for the same purpose. It is obvious that the Israeli economy cannot earmark such sums; however, partnership between the government and private sector (in definition of both objectives and investments) is possible. In addition, partnerships with the Gulf countries would not only enable Israel both to retain its strengths and its appeal to investors in the software and services sectors but would also help finance and develop the local hardware industry. Given that Israel is competing with technological powers that invest enormous sums, it is unlikely that Israel could implement this alternative without the support of the United States, Europe, and other countries. Adopting a national plan aligned with American strategy could make such support possible.

This memorandum is a call to discuss a "national technology strategy" as soon as possible. To facilitate such a discussion, it is essential to undertake preparatory work to identify the critical technological infrastructure necessary

for the existence and growth of the Israeli high-tech industry, to assure it can continue driving the country's economy, even in cases of political, climate, or other crises such as the COVID-19 pandemic. For example, just as the state is obliged to provide energy and food security in the form of fuel and wheat, it must also define basic technological security for the country. Most high-tech fields, such as cyber and artificial intelligence, are actually applications that depend on the existence of technological hardware infrastructure. This infrastructure includes assuring either the supply of chips, or the ability to produce them.