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AMERICAN COMPASS

CASE STUDY

How Industrial Policy Made the Desert Bloom

The public investments behind the Israeli economic miracle

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EXECUTIVE SUMMARY

Outsiders marvel at Israel's improbable rise to global technological leadership. A tiny desert nation, populated by refugees, under frequent military assault, and less than a century old is not supposed to be an innovative economic powerhouse. And yet Israel tops international rankings for business R&D investment intensity, NASDAQ-listed tech companies, and venture capital dollars per capita.

Israel accomplished this feat with an aggressive industrial policy that refutes the basic tenets of market fundamentalism. Its government spent billions of public dollars supporting private-sector firms across the entire economy. It aggressively audited the subsidized firms for years, claiming a share of subsequent revenues. And it imposed tight constraints on native-born innovations, prohibiting the transfer of intellectual property or establishment of manufacturing facilities outside its borders—even if no such manufacturing capability existed domestically. In theory, this is a formula for stagnation and sclerosis. In fact, it produced the opposite.

KEY LESSONS

Market fundamentalism's dire warnings about industrial policy and public investment do not necessarily hold true in practice.

Comparative advantage in the modern global economy is created by policymakers, not discovered through market competition. Rather than rely upon the comparative advantages of an underdeveloped desert economy, Israeli policymakers crafted a national economic strategy and industrial policies to rapidly expand the nation's miniscule R&D base.

Restricting transfers of intellectual property and mandating domestic production can fuel, rather than obstruct, innovation and investment. Whereas private incentives would have encouraged entrepreneurs to sell to larger foreign companies or move to more developed markets, Israeli policy restrictions created a bounded market for technology that fostered a domestic innovation ecosystem and high-tech industrial base.

Policymakers face no “knowledge problem” that prevents them from effectively deploying public resources in support of private industry. Israeli policymakers targeted funding to corporate activities and established blunt rules to align market incentives with the nation’s economic strategy.

BACKGROUND

Following its independence in 1948, Israel experienced extraordinary, virtually uninterrupted economic growth for more than two decades.¹ Its rapid development was fostered by protectionist policies and a national industrial strategy that supported the new nation’s agricultural and textile industries.²

But the nation lacked an R&D ecosystem. As late as 1965, it spent less on R&D (as a share of GDP) than any developed nation aside from Italy.³ In 1968, its industrial sector employed fewer than 900 R&D workers. Most research activity took place in academia and the military.⁴

National defense required a new approach. A French embargo beginning in 1967 forced Israel to develop its own military platform.⁵ The need for domestic innovation was underscored by successive economic crises in the late ‘60s and early ‘70s that imperiled the nation’s traditional industries and conventional political economy.⁶

Policymakers at Israel’s Ministry of Trade and Industry concluded that the nation was in “urgent need” of “rapid technological development” requiring “an accelerated effort in the field of industrial R&D.”⁷ They aimed to capitalize on the nation’s small but underutilized community of scientists in universities and the military.⁸ By 1984, government officials recognized the need to go even further by embracing a “a coordinated national technology policy” with an “active and unconventional” role for government to mobilize private industry.⁹

POLICY INTERVENTION

Israeli industrial policy proceeded in two distinct phases.

The first phase, beginning in 1973 and accelerating in the mid-1980s, focused on addressing a well-documented market failure in R&D and building the nation’s research networks into science-based industries.¹⁰ Its primary tool was the Office of the Chief Scientist (OCS), formally established in 1973.¹¹ Rather than “plan” the development of particular industries, OCS funded projects without regard to sector in order to maximize R&D and encourage businesses of all types to pursue technology-intensive products.¹² OCS’s officially “neutral” policy meant that companies in any sector could apply and receive multiple grants for multiple R&D projects, so long as they were focused on commercially viable products.¹³ As one of the first OCS employees would later explain, the goal was “[t]o create a sort of paradigmatic change in the way businesses thought about what they are doing.”¹⁴

The OCS placed strict, but common-sense, restrictions on recipients to encourage domestic growth and capture of spillover effects. Intellectual property developed in OCS-funded projects could not be sold or licensed beyond Israeli borders, and all production had to occur domestically.¹⁵ Successful firms that generated sales were required to pay royalties on their annual revenues, capped

at 150% of the original grant.¹⁶ Collecting royalties enabled the OCS to monitor how businesses stewarded their IP after the R&D phase.¹⁷ Until the 1990s, the OCS did not have a budgetary limit for its R&D grants, meaning that all eligible projects received funding.¹⁸

By the 1990s, Israel's scientific community was producing far larger numbers of commercially viable ideas than industry could finance and scale. Israel entered a second phase of its industrial innovation policy focused on the development of institutional supports for entrepreneurship and technological development.¹⁹

OCS launched the Technological Incubators Programs in 1991 to give inexperienced entrepreneurs, many of them academic scientists and researchers, the physical premises, financial resources, professional guidance, and administrative assistance necessary to commercialize their innovations.²⁰ Like OCS R&D grants, the two-year program was not limited by sector, but it did have selective criteria: Only high-tech products manufactured in Israel with viable export markets were considered.²¹

The following year OCS launched the MAGNET program (in Hebrew, the acronym stands for Generic Non-Competitive R&D) to create research consortia among firms and academic researchers operating in the same technological space. MAGNET consortia exist for up to three years to develop platform technologies that can be shared among the consortium members. Consortia are not limited by sector, but participants are required to license the IP to local companies at below-monopoly prices to diffuse new technologies as widely as possible.²²

In 1992, the OCS launched the \$100 million Yozma program, designed to build a domestic VC industry through strong networks with foreign financial markets. Yozma deployed 80% of its funds to create ten funds, each required to secure additional investments from at least one foreign and one local financial institution; the remaining 20% was dedicated to a public VC fund.²³ By 1996 the new funds had more than doubled in value, and Yozma became a model venture capital policy around the world.²⁴

IMPACT

Beginning in the mid-1970s, Israel steadily transformed from an exporter of agricultural products and textiles to a center for high-tech development.²⁵ Israel's high-tech sector successfully evolved from dependence on military procurement to civilian applications. Israel's "Silicon Wadi" became one of the most successful innovation ecosystems in the world.²⁶

OCS policies delivered on their stated goal of increasing R&D spending.

Israel has led the world in R&D as a share of GDP since the World Bank began tracking the data in 1997. Its average over the more than two decades since (4.1%) exceeds that of the second-highest nation, South Korea (3.2%), by nearly 30% and the United States by 50%.²⁷

Israel witnessed an explosion of entrepreneurship and firm creation.

In the 1990s, during the nation's second phase of industrial innovation policy, Israelis formed up to 400 new companies per year.²⁸ For comparison, the

same per-capita rate of start-up creation would translate to roughly new 20,000 American start-ups each year.²⁹ The Technology Incubators program was responsible for at least 70 of these new start-ups each year.³⁰ By 2012, Tel Aviv ranked second only to Silicon Valley as a start-up ecosystem.³¹ Today, Israel has nearly 4,000 active start-ups, second only to the United States, and has the most “unicorn” firms per capita in the world.³²

High-tech exports drove Israeli growth, and the nation became a net exporter.

By 1988, Israeli high-tech products made up 59% of its exports; by 1998, that figure rose to 71%.³³ In 2003, Israel finally closed its chronic trade deficit and became a net exporter.³⁴ In the United States over the same period, by contrast, the trade balance in advanced technology products plunged from surplus into deficit and such products as a share of exports peaked in 2000 and then steadily fell.³⁵

High-tech employment boomed and continues to capture a greater share of the labor force than any other developed nation.

After employing fewer than 900 R&D workers in 1968, with R&D spending as a share of GDP below every developed country except Italy, Israel saw an explosion of employment in the sector. In the 2020s, Israel’s 335,000 high-tech employees represent 10% of total employment, the highest share in the OECD and more than double the average in developed countries.³⁶ Israel’s GDP per capita is comparable to that of nations like Germany and Canada and above that of the United Kingdom and Japan.³⁷

ENDNOTES

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