

Israel's march towards high-tech Zionism

By Abdo Kadifa and Chibli Mallat

IN 1984, Shimon Peres, then Israeli premier, announced that his country was entering "the third stage of Zionism". After the first two stages, which he defined as the conquest of work and conquest of the land, he said Israel must usher in the era of the conquest of science; this third stage was to be achieved by the unrestrained development of high technology.

The emphasis on technology has been actively pursued since the early 1980s, and, as a small developing country, Israel has been unusually successful in producing military and commercial technology.

The scale of its success is impressive: science-based exports jumped from \$230m in 1976 to \$1.4bn in 1982. And although much of the output is in the highly publicised "battle-bred" military equipment, the sophistication of commercial products in some areas matches the quality of European and Japanese industries.

The variety of products manufactured by Israeli companies is also remarkable. They include microprocessor systems, thin-film electronics, integrated circuits, fibre optic communication devices, medical imaging equipment, surgical and industrial lasers, and biotechnology kits.

A good example of the diversity and breadth of the country's high technology is Elron Electronics Industries, the industrial conglomerate. Elron's most successful division is Elbit, which produces military computers and avionics equipment. Other divisions

include Fibronics and Optrotech, involved respectively in data communications and robotic vision systems, while another wing, the Zoron Corporation, designs and manufactures semiconductors.

Elron also exploits medical equipment and biotechnology with Elscint and the Biotechnology General Corporation.

However, such outward signs of technological success hide serious constraints on Israel's growth in technology. The Government itself has been accused of hindering expansion through interference in the economy. As a legacy of early Zionism, the Israeli State plays an interventionist role with a bureaucratic apparatus used to enhance the "socialist" appearance of the country. Prospective investors in Israel often complain that Israel's problem is a Government-imposed economic gridlock.

Also, the high-technology thrust has been hampered by Israel's economic recession. Until 1977, growth of Israel's gross national product (GNP) averaged between 7 and 10 per cent. In recent years it has declined to between one and 2 per cent. Although inflation is no longer in three-digit figures, it still lingers at around 20 per cent. The war effort, which demands 30 per cent of the country's GNP, places a significant strain on the economy, and foreign debt stands at \$6,500 per capita - the highest in the world.

Israel's success has also been tempered by its inability to manufacture its products

on any large-scale basis. A lack of minerals and other raw materials needed to sustain more conventional export industries, and the absence of a local inexpensive workforce, has forced the country to concentrate on low-volume, high-premium products. In the only case where the mass production of a high-tech item was attempted - the Lavi jet fighter project - the international situation and financial constraints made it impossible to continue.

Successes for Israeli high-tech companies can, therefore, only be relative. Mass production of high-technology goods, which could yield substantial revenues, would require a total national and international mobilisation which is almost impossible for a small economy.

Nevertheless, a number of companies have attempted to take advantage of the concept of specialised niche markets. The Elron conglomerate has been particularly active in financing such ventures and invested heavily in its affiliate, Elscint, which produces medical imaging equipment. Scitex, an independent company, also attempted to exploit this concept in the computer graphics market.

The drawbacks of such a strategy are considerable. The life of a successful innovative product lasts only as long as the prospective market is not saturated with competitive products which have been mass-produced by larger corporations.

Both Elscint and Scitex were confronted with this

problem and sustained heavy losses as their market niches became mature. In 1986, the companies lost US\$116m and US\$33.7m respectively and the Government was forced to intervene in an attempt to save them from bankruptcy.

The success of Israel's technology drive has also been limited by lack of capital. High technology is a capital intensive industry. Its basic production vehicles, sophisticated equipment and skilled manpower are expensive.

Product development cycles require a large influx of continuous and steady investment before reaching profitable products. Readiness for high risk is important; the success of one venture is paralleled by a multitude of bankruptcies.

Israel cannot sustain a policy of industrial redeployment on the basis of high-technology without outside help. Although the Government has passed laws alleviating tax burdens for new companies and set up special organisations for financial and administrative co-ordination, funding in Israel itself is not sufficient. Companies are obliged to go overseas for capital. More than 25 Israeli companies are traded on the US stock market, and \$250m has been raised through share issues in the past five years.

The expansion of technology has also been hindered by lack of a regional market. The Middle East market is barred because of political considerations and its relative economic immaturity.

The majority of the accessi-

ble Third World countries hardly consume any high-tech products except in the form of military equipment. And even in this sector, Israel is experiencing severe difficulties in obtaining repayments, with approximately \$300m of Israeli arms exports considered unrecoverable.

But the Government has successfully striven to overcome the lack of a regional market by opening up alternative markets elsewhere. It has signed two important free trade agreements - with the EC in 1975 and the US in 1985. These have created an export market for Israeli goods, unimpeded by tariffs or quotas, in over two thirds of Israel's present world outlets.

However, the base of the country's technological drive remains fragile. Many of Israel's highly-skilled engineers and scientists - the basic asset of the country - support research and development centres in foreign multinationals.

Israel enjoys a steady flow of home-grown technology graduates from such world-renowned universities and research centres as the Weizman Institute, the Hebrew University and Technion. It also has the highest number of Massachusetts Institute of Technology graduates per capita of any country outside the US.

However, these skilled Israeli workers are already being attracted abroad. Any setback in high-tech industries, such as has been occurring over the past two years

in the electronics sector, threatens to drive scores of highly skilled engineers abroad in search of a better equipped technical environment, and more stable and lucrative jobs.

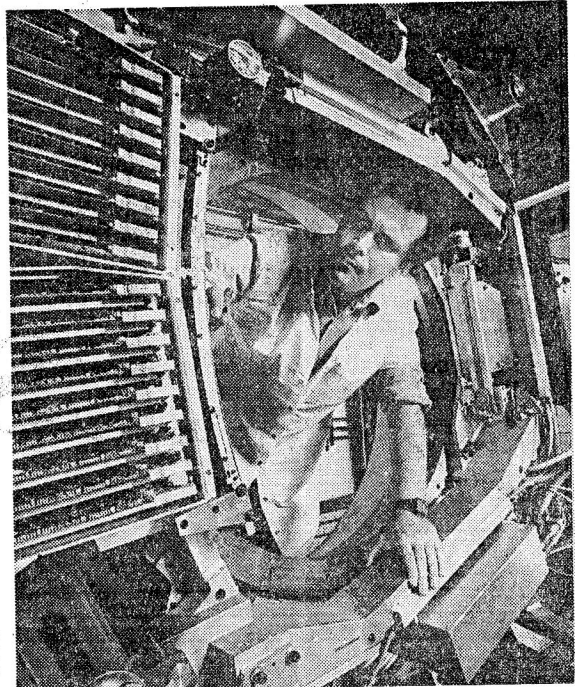
The country's policy is also fragile because much of the resources directed towards technology have been geared towards the military. Although military production has allowed Israel to export to Third World countries, there will be difficulties in sustaining the present effort.

The director general of Rafael Armament Development Authorities said: "In the case of consumer products cost usually decreases from one generation to the next. For military products the emphasis on almost impossible performance requirements leads to ever more complex systems from one generation to the next."

It is this heavy bias on the military which means that Israel's technology-led economic expansion does not appear to present a model for other developing countries.

Nor do other countries benefit from the favouritism in the international market that Israel enjoys. If developing countries want to establish a high-technology industry, they cannot count, like Israel, on unhampered technology transfer, easy capital, and tariff-free foreign outlets.

The price to be paid for such favouritism, however, is a constraint on political independence. For almost all its high-tech manufacturing and marketing, Israel still relies



Inspection of an Exel 1800 medical scanner from Elscint Medical Diagnostics. The company incurred heavy losses as markets matured and sales became harder to achieve.

on foreign participation.

An alternative can be envisaged. For a healthy development, Israel needs a reallocation of resources away from the military. Although Israel's high-technology drive was originally intended to conserve its superiority over its neighbours, it could be redirected if the economic walls surrounding the country were to disappear.

A change in the perception of Israel in the region, from the confrontational mood to open-door policies, would

decrease its dependence on the West. A synergy could be created with its Arab neighbours, generating a significant regional market which could contribute to the growth of all parties. Then, instead of serving military requirements, high-technology will address and solve real development problems.

Abdo Kadifa is a computer systems engineer with Xerox in the US. Chibli Mallat is a lawyer, specialising in Islamic and international law.