ISRAEL 2020:

A Strategic Vision for Economic Development

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Israel’s economic performance over the past decade has been impressive. The combination of recent structural reforms and huge investments in R&D has led to a high-tech boom. Israeli political and business leaders deserve credit for their successes: Many difficult reforms were enacted and much of the foundation for future economic growth has already been laid. Indeed, its successes have catapulted Israel into the top ranks of the developed world’s economies. But Israel’s new peers are formidable competitors, and Israel cannot rest on its laurels. Many other countries have also had impressive economic performances over the past 10 years and have grown faster and delivered greater gains to their citizens than Israel. In this regard, Israel is like a global corporation in danger of complaisance over its growth without realizing that it is losing market share and could well find itself facing an unexpected crisis. The fact that global competition from new quarters like China and India is more pressing by the day and that the favorable circumstances of the past decade are not likely to last, only increase this danger. Furthermore, not all sectors of the Israeli economy have performed well recently, and the social and demographic challenges facing Israel are daunting, to say the least.

Now is therefore the time to set out a strategy for the future. It is much better to enact further reforms from a position of strength when times are good, than to try to respond unprepared in the midst of crises. To assess the reality of Israel’s performance and to help shape thinking about how and along what lines to develop an economic strategy for the future, the Economic Strategy Institute has conducted a benchmarking exercise that compares Israel’s economic performance to those of Singapore, Taiwan, Ireland, Sweden, Finland, and Estonia.

Outlook for Israel

Our benchmarking study begins with a diagnosis of the current state of the Israeli economy. In particular, we need to understand what obstacles stand in the way of continued growth – both in terms of bottom line GDP growth and productivity growth, which in the end is responsible for raising wages and living standards. We also recognize, however, that Israel’s economic situation is shaped the constraints and opportunities afforded by the global economy. These days, it is not just companies that compete, but cities, regions and countries that are actively looking ahead to create the underlying infrastructure to sustain new growth, prepare their labor forces to work in the high-tech sectors of tomorrow, streamline business regulations and tax codes to boost efficiencies, and support cutting edge research and development at universities and research institutes that will lead to the next generation of products and services. The keys to success in this brave new world are increasingly being found in the public policies and institutions that create competitive business environments that enable companies to innovate and excel.

Along these lines, our diagnosis of the Israeli economy identifies the major binding constraints on growth within the context of Israel’s international competitiveness. The major challenges facing Israel are as follows:

1. The single biggest impediment to Israeli growth is its low labor force participation rate. Unemployment and underemployment affect not just bottom line GDP growth, but increase
inequality and inhibit the formation of human capital and skills among children growing up in poverty. Given Israel’s demographic trends, it is of the utmost importance to ensure that as many adults as possible are participating in the labor market.

2. A second and related constraint is the rising inequality visible in Israeli society. It would be one thing if rising incomes at the top were the only trend causing Israeli inequality to widen, but unfortunately the rising incomes of the rich are being exacerbated by growing poverty at the lowest levels of society. Of course, encouraging greater labor force participation by the Israeli Arab and Ultra-Orthodox sectors would go a long way towards reducing inequality, but so too would concerted efforts to improve the flexibility of the labor market and encourage private sector job creation.

3. A third constraint on growth is the state of traditional industries and the service sector in particular. The strong growth of Israel’s high-tech sector has tended to mask the stagnation of the domestic service sector and of small to medium size enterprises in ‘low-tech’ sectors of the economy. The health of these sectors is all the more important considering that, since not everyone can be a rocket scientist or an electrical engineer, employment opportunities for those not currently engaged in the labor force will have to come in less skilled occupations.

4. Too many Israelis are entering adulthood without the appropriate skills in demand in the labor market. Although Israel’s elite universities do a good job of turning out highly skilled scientists and engineers, not every can attend these institutions and too many of Israel’s primary and secondary schools are failing to teach their students marketable skills.

5. Israel’s high-tech sector has been its engine of growth in recent years, but high-tech entrepreneurs are too focused on exit strategies rather than growing their businesses into successful stand alone firms that create large numbers of domestic jobs, high levels of exports, and sustained investments in future capacity.

6. Israel also suffers from inefficient public institutions that are all too often tarnished by corruption allegations and stifle the economy with too many regulations and red tape. To some extent, this situation is the result of the ongoing structural changes in the Israeli economy and the move away from state intervention in the economy towards a more market oriented system. This has led the most highly skilled Israelis to seek out opportunities in the private sector. But given the professionalism and general competence of Israel’s military, a modern, well run, professional bureaucracy should be within reach.

7. Israel’s infrastructure is another constraint on growth. Traffic congestion is perhaps the most visible symptom of the lack of investment in physical infrastructure, but Israel’s ports, railroads, electricity generation and transmission facilities could also use upgrading. In addition, many of Israel’s most disadvantaged residents live in areas poorly served by public transportation and lacking in direct connections to major employment centers. Making it easier for these people to get to and from work could help them reenter the job market.

8. Finally, Israel is cut off from its hinterlands in the Middle East. While Israel’s foreign relations and the peace process with the Palestinians are outside the scope of this report, it is nonetheless worth emphasizing the huge economic gains that would accompany a regional peace deal. Israel will never achieve its full economic potential as long as it remains cut off from so much of the Middle East. By the same token, the prospective Palestinian state in the West Bank and Gaza will not be a viable entity without strong economic ties to the state of Israel, and without a viable economy, the Palestinians will remain a security risk for Israelis.
Benchmarking Findings

While our benchmarking countries certainly do not share all of the same economic policies, they all approach the fundamentals correctly. A few basic conditions must be met for any successful economy to grow:

1) **Macroeconomic Stability**: All modern economies require a stable macroeconomic environment – inflation rates and exchange rates must be kept stable; public budgets must be kept near balance, and the overall debt burden must not be allowed to grow too large. Responsible fiscal and monetary policies are a prerequisite of long term economic growth.

2) **Rule of Law**: Governments and bureaucracies must be free of corruption. Rules and regulations must be transparent, public services must be administered efficiently, the legal system must protect private property and other rights, and there must be a system of accountability to hold people responsible for their mistakes and reward successes.

3) **Infrastructure**: Basic infrastructure must be seamless, reliable, essentially taken for granted. Transportation must be efficient and relatively free from congestion; Ports must have adequate capacity, be efficiently run, and be free from labor strife; Telecoms must operate on a particularly advanced and efficient level – ubiquitous high speed internet access is a must, as are wireless services and affordable access; electricity, water and waste services must be invisible and reliable.

**Main Recommendations:**

Apart from the above fundamentals, however, the main attribute that all the countries in our benchmarking study share is that they all have economic development strategies. Although they did not and will not pursue the same types of strategies, they all have developed institutions with the ability and resources to plan and implement economic development strategies that meet the specific needs and challenges their countries face. Political, business and labor leaders in these countries all believe that economic competitiveness is of the utmost importance and attempt to work together to craft comprehensive and effective policies.

As such, the central finding of our study, and the main policy recommendation we have for Israel, revolves around the capacity of the Israeli state to create economic policies that will improve the competitiveness of the Israeli economy. The most important priority is to build the institutional capacity to identify the strengths and weaknesses of the Israeli economy, and take steps to improve the competitiveness of the economy and the well being of Israeli citizens.

1. Israel should view its economic competitiveness as a crucial component of its national security. Only by according economic issues the same weight and importance as security considerations can Israel succeed in guaranteeing its continued security and well-being.

2. Establish a National Competitiveness Council chaired by the Prime Minister, and charge this council with completing an annual assessment of the nation’s competitiveness. The Council should include the heads of several key ministries, including Education, Finance, Trade and Infrastructure, as well as senior representatives from labor, academia and the business community.
3. Create an Agency for Economic Development that would have a mandate to promote long-term investment in the Israeli economy with an emphasis on creating jobs, fostering new technologies, improving management practices, and expanding exports. The overarching goal should of course be to improve the overall standard of living in Israel and increase the country’s stock of human capital. But the agency should have the authority to take very specific steps to achieve these goals – it should be able to reform everything from tax codes and business regulations to labor laws and it should be given a budget to support continued investment in R&D, infrastructure and export industries.

4. The Office of the Chief Scientist would be an important element of this agency, but given the success the Chief Scientist has had in promoting high-tech, the role of the Chief Scientist should not be fundamentally altered – it should continue supporting R&D investment as much as possible, and should change its funding priorities only in response to specific needs or goals identified by the Agency for Economic Development.

5. This agency should also be given the responsibility of promoting foreign direct investment in Israel. A special investment service could also be created within the diplomatic corps to promote Israel abroad.

6. Another important mandate the agency should be given is to spread the latest technology and management techniques widely throughout the economy with the express aim of leveraging new technologies and management techniques so low tech industries can improve their efficiency and productivity.

7. Israel should strive to reach an accommodation between labor, management, and government to encourage all of these parties to work together to improve the competitiveness of the Israeli economy and build human capital. Israel must achieve the same kind of labor flexibility and skilled workforce as its leading competitors. Part of the solution here could be modeled on the Danish flexicurity system.

8. Create a required core national curriculum for all primary and secondary schools for all ethnic and religious groups. Emphasize science, math and English language proficiency from an early age. Improve the quality of the schools and ensure that all Israelis have access to a high-quality education that will train them for specific jobs in the labor market.

9. Create a Skills Map modeled on the efforts to chart future labor market demand in Ireland and Singapore and make sure that the education sector is producing graduates with skills that will meet this demand.

10. Require a form of national service from all ethnic and religious groups even if they do not perform military service. Some kind of national service on the part of the Arab and Ultra-Orthodox communities can both build a stronger sense of national identity and address specific needs and problems these communities need to overcome.

11. Maintain the independence of the Bank of Israel, but give it a mandate to manage monetary policy not only for inflation but also for full employment and to maintain a low and stable exchange rate.

12. Expand the tourism industry with an eye to providing employment opportunities for less-skilled workers. Tourism is also an area where the interests of Israelis and Palestinians coincide, and provides an opportunity for the two communities to cooperate and work together.
13. Create an ‘infrastructure czar’ to oversee a comprehensive upgrading of the entire national infrastructure. This should be a Ministerial level position and should include responsibility not just for basic infrastructure like transportation and energy projects, but also telecommunications. Fast, reliable broadband and wireless communications system are a crucial part of the ‘innovation ecosystem’ and an integral part of Israel’s economic competitiveness.

14. Reduce corporate taxes as much as possible. Try not to give special tax breaks to favored industries, but rather try to reform the corporate tax system to make Israel an appealing place to invest compared to other foreign jurisdictions. In this regard, tax rates should not just be lowered, but the tax code should be simplified to reduce the time and effort companies spend filing their taxes and to reduce the opportunities for corruption.

15. Israel needs to leverage the success of its venture capital industry and high-tech start-ups to create large, world class Israeli companies. To this end, Israel should encourage long-term investments by raising short term capital gains taxes to discourage speculative capital flows but lowering long term capital gains taxes.

16. Small, open economies like Israel’s need to carefully manage their current account balances to ensure they have adequate foreign exchange reserves to protect themselves from volatile international capital flows and to maintain independent monetary and fiscal policies. The best way to ensure this is to craft tax policies to promote saving and investment over consumption. Israel should consider imposing consumption levies (like a VAT) and a carbon tax. Revenue from these taxes could offset the loss of revenues from lower corporate taxes. Lower corporate taxes would also increase Israel’s national savings rate by improving corporate profitability. For personal taxes, establish a progressive flat tax as in Estonia.
Any strategic vision for Israeli development must begin with a diagnosis of the current state of the Israeli economy. In particular, we need to understand what obstacles stand in the way of continued growth – both in terms of bottom line GDP growth and productivity growth, which in the end is responsible for raising wages and living standards. Our analysis begins by asking a series of questions about the nature of these growth constraints. In other words, are higher growth rates being constrained by a lack of access to capital? Or perhaps capital is plentiful but the returns to investment are low. If the problem is that returns to investment are too low, why is that? Are tax rates too high, are there labor shortages or is the country’s stock of physical infrastructure inadequate?

This chapter will focus on our diagnosis of the Israeli economy. Once we have identified the key problems with the Israeli economy, we can begin planning for an appropriate policy response – one that targets the key constraints on growth, and lays the groundwork for sustainable long-term productivity growth. Economic reforms are often politically challenging: policy makers are constrained by the institutional and administrative environment they operate in, and reforms can challenge entrenched interests or favor certain constituencies over others. By focusing on the particular constraints on growth and targeting policy responses to specifically address these problems, we can ensure that politicians spend their political capital wisely, pursuing policies that will get the most ‘bang for the buck,’ or the largest economic return on their political capital.

Diagnosis of the Israeli Economy

In 2006, the Israeli economy was, in most respects, as strong as it has ever been. Nearly all the important economic indicators showed positive progress. The resilience of Israel’s economic expansion was such that the country’s business sector managed to shrug off the war with Lebanon, despite the major disruption the conflict brought to the north of the country. The final data for 2006 showed that Israeli GDP grew by 5.1%, the unemployment rate declined to 8.4%, exports grew by over 9.3%, and the country ran a current account surplus of nearly 5% of GDP. This strong showing is a testament to the success of the structural reforms enacted in Israel in the 1990’s, Israel’s macroeconomic stability and the strength of the Israeli high-tech sector.
Israel’s recent macroeconomic stability is both a major achievement and a big part of the reason the war with Lebanon did not have more of an adverse impact on Israeli economic growth. The country’s declining levels of public debt, its current account surplus, rising foreign exchange reserves, and benign inflation rate all contributed to public confidence in the economy and to expectations of continued growth and stability. Indeed, foreign direct investment in Israel increased substantially in 2006 (although many of the deals were made prior to the outbreak of hostilities). Moreover, FDI was not confined to the high tech sectors of the economy, as Warren Buffet’s $4 billion purchase of Iscar, a maker of precision tools for the metals industry, attests.

Some of the best news in 2006 came in the area of public spending and debt levels. Israel’s government deficit ran to 0.8% of GDP, and overall public sector debt declined to 1.8% of GDP in 2006, the best showing in years. The total outstanding public debt to GDP ratio fell sharply and now stands at 88%. Although this figure is still too high, Israel’s recent record of fiscal responsibility and the strong trend data provide hope that future reductions in the debt burden will be achieved.
There was good news too on the inflation front. In the fourth quarter of 2005, it looked as if Israel's strong economic growth would push the inflation rate up above the targets set by the Bank of Israel. The Bank reacted quickly, however, raising its benchmark interest rates to head off rising inflation expectations. At the end of the year, Israel actually experienced a benign deflation, with the inflation rate coming in at -0.1%. While this number is outside the target range set by the Bank, given the otherwise strong growth numbers, it is not a cause for concern. In fact, price stability is an extremely important achievement for Israel, as sustained periods of high inflation, which Israel has all too much familiarity with, tend to be very difficult to break and disrupt the underlying fabric of the economy. With inflation under control, the Bank of Israel was able to gradually reduce its benchmark interest rates towards the end of the year and the beginning of 2007, thus supporting liquidity and investment and helping the economic expansion to continue. In large part, contained inflation was due to the strong shekel, or put another way, the weak US dollar, which declined substantially against all the major freely-floating currencies in the world. The shekel has continued its strength in the first quarter of 2007, rising above the psychologically important threshold of 4 to the dollar. A strong shekel helps to keep import costs down, thus keeping the inflation rate low.

A glance at the Israeli economy shows a small nation moving ahead in the globalized world. However, the question facing Israeli policy makers is whether or not they can sustain this sort of growth and stability on their current path. Israel faces many problems, ranging from global fiscal imbalances to low labor participation rates. The following sections examine the specific issues facing Israel on both a domestic and an international level.

**High-Tech Sector and Innovation**

The locomotive of the Israeli economy has for the past decade been the ICT sector, and 2006 proved to be a banner year. All of the subsets of the ICT sector – from manufacturing to R&D and computer services – experienced strong growth. Total output in the ICT sector grew by 10%, exports grew by 18%, employment grew by 7.3%, and the real wages in the sector increased by 3.7%. This impressive performance has been the main driver of the Israeli economic expansion, and the strong growth looks set to continue into the future. The manufacturing sector, business services, and the financial industry all saw strong employment growth during the year. One of Israel’s great strengths is the entrepreneurial nature of its society. Israel has
practically created an industry out of starting up new technology companies, and the country’s ties to Silicon Valley and the Venture Capital industry are second to none outside of the US.

Venture capital investments rose to $1.62 billion, and both M&A and IPO activity was strong. The ICT sector’s share of the total Israeli business sector grew from 12.2% in 1997 to 16.8% in 2006. ICT now accounts for 25% of Israel’s total exports of goods and services. Also notable has been the performance of the pharmaceutical sector, which saw its exports rise by 17% year over year in 2006.

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<th>Israel’s Total Exports and US Total Trade, 2006</th>
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<td>Electronics</td>
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<td>Electronic communications</td>
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<td>Equipment for control and supervision and medical and scientific equipment</td>
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<tr>
<td>Electronic components</td>
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<tr>
<td>Chemicals, fertilizers and pesticides</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
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<td>Rubber and plastics</td>
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<td>Textiles</td>
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SOURCE: Based on Central Bureau of Statistics and US foreign trade data.

Israel’s GDP and export growth has been supported by high levels of productivity growth, particularly in the manufacturing sector, where exposure to international competition is highest. That said, both overall growth levels as well as productivity showed much stronger improvements in the high-tech and medium-high-tech sectors than in lower value added industries. This raises the questions of how the structural changes underway in the Israeli economy will impact the employment situation, particularly for unskilled workers, and whether Israel is generating enough spillover effects from its high-tech sectors into the rest of the economy. Moreover, the impressive levels of entrepreneurialism in the high tech sector need to be expanded into ‘low-tech’ sectors and the Arab and ultra-orthodox communities.
An ongoing question with regards to the Israeli high-tech sector is whether the country’s entrepreneurs are too focused on exit strategies and not focused enough on building long-term sustainable enterprises with correspondingly high spillover effects on the economy in terms of employment growth, the tax base, consumer demand and other variables. There is a perception in Israel that Israelis lack world class management skills and that the country is too far removed from its major markets in North America and Europe to be able to maintain all the headquarters functions – sales, marketing product development and the like – within Israel. Hence many entrepreneurs, when they go public or sell their company to a foreign investor, tend to keep the R&D functions in Israel but look outside of Israel for managerial expertise. This perception is not likely accurate – Israel in fact has a very high level of managerial expertise and competence, but the challenge remains for Israel to get the most it can out of its high-tech businesses.

Israel’s economic competitiveness, as measured by the IMD and World Economic Forum, is marked down for its tangle of regulations, high corporate tax rates, inefficient public services, difficult labor relations and pervasive corruption. It is likely that these factors present roadblocks in the efforts of Israeli entrepreneurs to develop Israeli based multi-nationals, and are potentially good targets of reform efforts to improve the business climate in the country. Israel has the human capital, and in scientific and R&D work it is allowed to achieve its full potential (thanks in part to the efforts of the Office of the Chief Scientist and Israel’s high overall levels of R&D spending). But the tax system, regulatory environment, and labor situation all conspire to inhibit the growth of large companies in Israel, and could be reformed to encourage their development.

Israeli high-tech sectors are coming under increasing international competition – especially in the ICT sector, where intense competition has been pushing down prices and lowering margins for many ICT businesses around the world. China’s exports of ICT goods and services have been growing by over 40% annually since 2000 and it is now the single largest exporter of ICT in the world. One of the most striking aspects of the ICT sector is the extent to which trade is growing faster than production. In the EU, for example, total trade (imports and exports) of ICT goods and services increased by an average of 8.2% annually from 1994 to 2004, while total production increased by only 2.8%. These figures point to the expansion of ICT production capacity in Eastern Europe, Asia, and a few other developing countries. These countries are also showing huge gains in productivity growth, which means that they are rapidly catching up to the rest of the world and becoming ever more attractive locations for investment.
While most of the competition from China is centered on the manufacture of ICT goods, trends in the exports of ICT services also show the effects of increasing international competition. Ireland, with its low corporate tax rates, access to the EU’s single market, and English language base, is far and away the largest exporter of ICT services in the world. But this strength underlines a shift in the make-up of Irish ICT exports – manufactured goods have been declining and the country has been undergoing a structural shift to a greater reliance on services. This trend will likely become more pronounced in the major centers of ICT in the developed world. Indeed, Finland and Sweden have, like Israel, been suffering from a decline in their terms of trade in part because of increasing competition in ICT manufacturing. In this context, the potential of India and other emerging markets as locations for ICT services outsourcing will be one of the key challenges and opportunities for Israel going forward.

**Labor**

Israel has shown a slight improvement in its unemployment and labor force participation rates as a result of expanding economic activity. The unemployment rate came down to 8.4% in 2006, capping three years of improvements, while the labor force participation rate edged up slightly. But while these trends are positive, the medium term outlook for Israeli employment is less promising. One of the major challenges facing Israel (and indeed all economies in this era of globalization) is improving productivity rates in the non-tradable sector and the service sector in particular. Rising productivity rates are the ultimate key to sustained gains in standards of living and wealth creation. But in the short term, productivity gains in many service sector businesses could result in layoffs. If increasing efficiency in the services and traditional industrial sectors leads to more layoffs, then Israel will have to do more to increase its level of job creation – with a particular emphasis on those with low skill levels.

Despite the strong showing of the Israeli economy recently, the benefits of economic growth are not being evenly distributed, and many sectors of the population are not participating in the formal economy. Poverty rates among the Ultra-Orthodox and Arab sectors of the population have increased significantly over the past decade, and given the demographic trends in Israel, these results are very worrying for the long term. Indeed, while 20% of all Israeli families are below the poverty line, this figure rises to 35% when you measure the proportion of children living in poverty. These two groups account for over 60% of Israel’s poor, and the full extent of their exclusion from the mainstream economy becomes clear with statistics that show how the incidence of poverty increases along with family size, those with less education, and families with one or no full time wage earner. Much of Israel’s energy has gone toward developing a booming tech sector—a goal achieved with much success. The returns to this growth have not yet spread to the broader
population however. Most high tech work, particularly software development, does not actually require a great number of laborers. Those that are required must be very well educated. So, while the tech sector’s profits and importance in the Israeli economy grow by leaps and bounds, the returns to this growth fall to only the best-educated Israelis.

On the other hand, significantly less focus has been placed on the development of a low-tech sector. This lack of attention has resulted in stagnating job growth within the low-tech and services sectors. Employees within the low-tech and service sectors are not seeing growth in wages or job opportunities. Given the widespread agreement among Israeli political and business leaders of the need to better integrate disadvantaged sectors into the economic mainstream, two key issues emerge. First, Israel needs to develop a strategy to match the specific skills of individuals with labor market demand. The high tech sector is already suffering from labor shortages in certain areas, but more broadly, the real barrier to improving the lot of the disadvantaged is that they tend to lack skills and expertise in the areas of the labor market that are experiencing increasing demand. Targeted vocational and adult education programs could be a big part of the answer here, but they should be coordinated with the private sector to be sure that at the end of the programs, there are jobs waiting for the graduates. Second, Israel must focus on expanding job growth at all levels of the economy, not just those at the very top of the production ladder.

Perhaps the central challenge facing Israeli policy makers is the need to increase the country’s labor force participation rate. Only 55% of the country’s population works and the brilliant recent performance of Israeli high-tech sectors have mostly benefited a small proportion of the overall population and stand in
stark contrast to the stagnation and low productivity rates in the traditional sectors of the economy. Over 2.5 million Israeli adults simply do not participate in the economy, leaving a workforce of 2.6 million to shoulder the burdens of working and paying taxes. Under and unemployment in the Israeli Arab and Ultra-Orthodox populations in particular leave these sectors subject to poverty and cut off from mainstream society. Given that the birth rates in the Ultra-Orthodox and Arab sectors are much higher than in the Israeli populations as a whole, these problems will only worsen if no steps are taken to redress the situation.

The problems in these two sectors are unique – Ultra-Orthodox men are exempt from military service and then often choose not to work, preferring instead to spend their time in Yeshiva. Only 50% of Haredi men work at all, and many of these work in low-skilled, poorly paying positions. In the past, this choice has been made easier by generous welfare payments and social services. But in recent years these programs have been cut back and there is growing pressure on the Haredi to enter the workforce. But even if these men are becoming convinced of the need to work (and this process is still in its infancy and is by no means settled) most of them are untrained and lack the skills that are in demand in the labor market.

Still, one of the strengths of a Yeshiva education is that its students learn how to study – and this talent should be taken advantage of with targeted adult education programs designed to give these communities marketable skills that can help them enter the labor force. Adult education programs have been very successful in countries like Sweden and Finland where severe recessions necessitated widespread shifts in employment and the need to retrain workers who had lost their jobs for positions in new sectors that were created after the economy started to recover.

The Israeli Arabs are in an altogether different situation. The Intifada severely damaged their economy – as Israeli restrictions on travel and trade with the West Bank and Gaza cut established ties between Israeli Arab businesses and their markets and suppliers on the other side of the Green Line. Like the Haredi, Israeli Arabs are also exempt from military service and hence miss out on the personal connections and networking opportunities that such service has traditionally provided. Israeli Arabs also suffer from discrimination – they are excluded from the military industrial sector for security reasons, and since the Intifada many Israelis are hesitant to visit Arab communities to shop in their stores or eat in their restaurants. This problem is compounded by the poor levels of infrastructure serving Israeli Arab communities. They are often isolated from the main employment and populations centers in Israel, with poor road and rail links, a lack of public transportation, and a shortage of industrial zones. In addition, for largely cultural reasons, Israeli Arab women have especially low labor force participation rates, and men suffer from a lack of human capital and skills that are in demand in the labor market – only 3.5% of Israeli Arabs have a university degree.
On the plus side, Israeli Arabs have a very entrepreneurial culture and own and operate over 40,000 businesses. Most of these are small businesses concentrated in the construction, auto repair, and food industries – shops and restaurants and the like, but are reasonably well integrated with the rest of the Israeli economy. Most Israeli Arabs have no desire to live under the Palestinian Authority and want to continue to be Israeli citizens and work to improve the status and prosperity of their communities. Special programs, particularly educational reforms, worker retraining programs, and improvements to basic infrastructure could go a long way towards improving the economic prospects of this sector.

Israel needs to use carrots as well as sticks in encouraging its citizens to join the workforce, and cuts in welfare benefits should be balanced with programs that encourage labor force participation. Although many benefit levels have been cut in recent years (which presumably should increase the incentives for those out of the labor force to return to work), many programs, such as the child welfare allowance, are lacking in criteria that tie receipt of such services to employment. On the other hand, some types of welfare programs are conducive to working. Subsidized day care facilities, for example, encourage women to join the labor force. Subsidized public transportation could help individuals from geographically isolated or outlying communities to commute to employment centers. The point here is that the challenge for Israeli public services and welfare programs is to comprehensively design them to attack the root causes of poverty – the lack of marketable skills and employment opportunities – by easing the path for people to enter the labor force.

Education

Much of Israel's recent economic performance is the result of investments in human capital and education made 30 years ago. The current crop of engineers, scientists and technicians driving the high tech sector all came out of military and university programs that were created years ago. But recently, Israel's education budget has faced cutbacks, and the performance of Israeli students on standardized tests like the OECD administered PISA tests have deteriorated. A big part of the problem here is Israel's lack of unified school system or even core curriculum. Israel has three different educational systems at the primary and secondary levels – for the secular Israelis, the religious, and the Arabs. The religious schools do a particularly poor job of preparing students for the workforce. The different systems also do not help efforts to promote national unity, and suffer from unequal access to resources. Further, the discontinuity in educational systems is closely linked to low labor participation rates among ultra-orthodox and Arab Israelis as well as rising levels of inequality.

At the tertiary level, the situation is better, but far from perfect. The quality of a few elite research universities is quite good, but they face funding problems and the links between university research and the private sector could be improved. There has been a dramatic increase in enrollment in higher education recently, but many of these spots were found in new colleges as opposed to research institutions. If Israel is to maintain its place at the forefront of the technology export sector, it needs to ensure that there are enough well educated individuals to fill the necessary jobs. This requires preparing students for science and tech related careers beginning at an early age, not just at the collegiate level. A national core curriculum that focuses heavily on math and science can pave the way to a stronger tertiary research sector later on.
This standardized curriculum can also promote more equitable education levels across Israel's various ethnic and religious sectors. Much more needs to be done in the terms of using education to bring more ultra-orthodox and Arabs into the labor force. Increased ultra-orthodox and Arab work force participation has two effects: promoting greater overall productivity within the Israeli economy and allowing these populations to reap the benefits of Israel's growing economy. The first step is to properly prepare primary and secondary students in these populations to participate in the work force and possibly move on to higher levels of education. A standardized curriculum is key to achieving this goal. The second step toward greater labor force integration comes through vocational training, life-long learning and a focus on market oriented skills-training. Whatever fiscal or structural incentives are created to encourage workforce participation in these two groups, such measures will be moot if no education is provided to adults to prepare them for the jobs available in the Israeli economy.

### Infrastructure

The state of Israel’s infrastructure leaves much to be desired. For such a small, densely populated country, its public transit and road systems are remarkably underdeveloped which has a significant effect on the country’s economy. Lack of infrastructure leaves rural areas and smaller towns unconnected with the major economic centers despite being in relatively close proximity. These areas are plagued with economic stagnation and inequality. Bringing them into the grid through affordable, accessible public transit and better roadways can turn these areas into potential investment locations. The residents of these areas will have better access to jobs, services and educational opportunities that can be found in Israel’s larger urban areas.

Connecting areas within Israel should not be the only goal with regard to infrastructure—Israel lies in a very strategic coastal location. In a perfect world, Israel would focus on creating a transportation infrastructure that better connected its ports not only with Israeli cities but also with the surrounding countries. Israel could profit from a new role as the shipping and transportation hub of their area. Obviously, this may not be an immediate possibility for security reasons. However, Israel should focus on building an open-ended transit system that could plug into other existing infrastructures, in the event of a more stable political environment in the region.
Public Sector and Institutions

It seems that for much of 2007, barely a day has gone by without some news story breaking about a new corruption scandal involving an Israeli bureaucrat or politician, some labor action on the part of an Israeli union, or a new report outlining inefficiencies and waste in the Israeli public sector.

Of all the countries in our benchmarking study, Israel ranks last or next to last in all the IMD’s global competitiveness rankings of government efficiency and effectiveness. The rankings show Israel’s public sector is a drag on the country’s international economic competitiveness. In part, this is due to the unfinished nature of the structural reforms that Israel has undertaken in recent years to transform itself into from a state-directed economy with many socialist elements to a capitalist market led system.

But there are other, deeper problems. Leaving aside for a moment the instability caused Israel’s geo-political environment, its frequent elections and the pressures of forming coalition governments, Israel seems to have a deeply politicized bureaucracy that is marked by a lack of professionalism, inefficient regulations, and high levels of corruption. Its regulatory regime is expansive, expensive and difficult for companies to deal with, and the lack of transparency increases the potential for corruption. Many public policies seem driven by political considerations or special interests rather than any concerted effort to improve the competitiveness of the economy. And despite the high levels of public spending in Israel, many public services appear to be inefficient.

Reforming Israel’s public institutions are one of the most important set of improvements the country can make in its efforts to improve its economic competitiveness. Markets and businesses do not operate in a vacuum, and are greatly affected by tax rates, the quality of regulations, the effectiveness of the rule of law, and corporate governance standards – all of which are the province of public institutions.

Moreover, small economies are, almost by definition, much more susceptible to exogenous forces than large countries. On the one hand, this means the opportunities the global economy affords them are that much
greater than for large economies. Access to export markets, new technologies and managerial techniques are all a boon to small countries with limited resources. On the other hand, the risks that small economies face are also that much greater. International competition can render domestic industries obsolete almost overnight. Financial contagion can spread across the globe almost instantly.

The upshot is that small economies like Israel need to have coherent, comprehensive strategies of economic development to navigate the shoals of the global economy, and such strategies can only be formulated and implemented by the government.

**Business Environment and Global Macroeconomy**

When viewed in a broader global context however, Israel’s economic growth is less impressive. 2006 was a good year pretty much across the board. The economic expansion in the United States continued, albeit at a slower pace than previously, while Europe and much of Asia posted strong numbers. And while the achievements of Israel’s high tech sectors are impressive, that very success has pushed Israel into a very exclusive neighborhood. Israel’s newfound peers – that collection of small advanced economies that are leading the way in creating innovative new products and services and operating at the cutting edge of the global economy – are, in many ways, doing much better than Israel. For example, Israel ranks ahead of only Estonia and Taiwan in terms of GDP per capita at current prices among the countries in our benchmarking exercise, and it has been badly outpaced by many of them in recent years.
Israeli economic statistics are also not uniformly positive. One worrying trend is the decline in Israel’s terms of trade – which have declined every year since 2002. To some extent, the factors driving this decline are outside of Israel’s control – rapid industrialization in China and elsewhere are pushing up demand for commodities, resulting in significant increases in the prices of oil, metals and other commodities. As is Israel depends on imports for most of its natural resource consumption, rising commodity prices are a significant component of the deterioration in Israel’s terms of trade.

Israel’s recent economic performance has taken place in the context of strong global growth. The ‘goldilocks economy’ we have been witnessing for the last couple of years, with GDP and productivity growth powering ahead even as inflation remains benign, is akin to a tide that has lifted all boats – but it is not guaranteed to last indefinitely. Cheap credit has fuelled a big increase in global liquidity, making capital widely available for new investments. But it has also driven a scramble for returns, and risky credit sectors – from emerging market debt to junk bonds - are all at historically low spreads over benchmark rates. Risk could come back to haunt global capital markets, and with it volatility and sharply higher interest rates.

The low inflation rates of the past few years have been largely the result of a strong shekel. However, a strong shekel is potentially a problem for the Israeli economy, as its recent growth has been driven in large part by rising exports. Although most Israeli exporters invoice their goods and services exports in dollars, their costs are primarily shekel denominated, so a rising shekel squeezes their profit margins. Unfortunately for Israel, much of the movement in foreign exchange markets recently has been due to forces beyond its control – the huge and increasing US current account deficit, with the corresponding surpluses in East Asia and the oil-exporting states have created an increasingly unbalanced global economy. The fact that many of the surplus countries manage their currencies has prevented the markets from adjusting exchange rates to help bring these imbalances back into line. Thus far, the dollar adjustment has only impacted the Euro and other floating currencies like the Pound Sterling, while China and other Asian nations in particular are keeping their currencies artificially low to maintain the competitiveness of their exporters. Going forward, the Bank of Israel will have to factor in the effects of an appreciating currency on the competitiveness of the economy as well as its impact on inflation.

There has also been no resolution to the widening global current account imbalances, and the world is still dependent upon the US consumer as the engine of global demand. With the US housing market weakening and commodity prices showing no sign of coming down much from their recent highs, the ability of US households to continue consuming at their current pace might be coming to an end. If that were to occur, the world would need to find a replacement for this lost US consumption. Unfortunately, a quick look over the usual suspects suggests that it will be hard for the world to decouple from the US economic cycle. Asia is still reliant on export led growth, with very high savings rates that limit the ability of Asian consumers to step up as a source of demand. And while Europe has shown encouraging signs that it is making headway with structural reforms, the demographic challenges facing the continent are such that sustained increases in European consumption seem unlikely.

To sum up, one of the most important implications of globalization has been the increasing interconnectedness of national economies. When times are good, as they have been, the opportunities for economic growth are spread widely across the world. But when times get tough, it will be difficult to escape the slowdown. And while predicting the future course of global economic growth is difficult, there is one thing we can be sure of: As JP Morgan put it, when asked what he thought the markets would do in the future, he responded, “The markets will fluctuate.”
Key Constraints on Growth

Despite the stellar recent performance of the Israeli economy, Israel now faces the challenge of sustaining and extending its recent record of growth and ensuring that the gains from growth are distributed more evenly across the population. To do so, it needs to remove some of the key constraints on growth that are holding the economy back from reaching its true potential. The following are, in our judgment, the most important policy areas for Israeli leaders to focus on.

The single biggest impediment to Israeli growth is its low labor force participation rate. Unemployment and underemployment affect not just bottom line GDP growth, but increase inequality and inhibit the formation of human capital and skills among children growing up in poverty. Given Israel’s demographic trends, it is of the utmost importance to ensure that as many adults as possible are participating in the labor market.

A second and related constraint is the rising inequality visible in Israeli society. It would be one thing if rising incomes at the top were the only trend causing Israeli inequality to widen, but unfortunately the rising incomes of the rich are being exacerbated by growing poverty at the lowest levels of society. Of course, encouraging greater labor force participation by the Israeli Arab and Ultra-Orthodox sectors would go a long way towards reducing inequality, but so too would concerted efforts to improve the flexibility of the labor market and encourage private sector job creation.

A third constraint on growth is the state of traditional industries and the service sector in particular. The strong growth of Israel’s high-tech sector has tended to mask the stagnation of the domestic service sector and of small to medium size enterprises in ‘low-tech’ sectors of the economy. The health of these sectors is all the more important considering that, since not everyone can be a rocket scientist or an electrical engineer, employment opportunities for those not currently engaged in the labor force will have to come in less skilled occupations.

Still, too many Israelis are entering adulthood without the appropriate skills in demand in the labor market. Although Israel’s elite universities do a good job at turning out highly skilled scientists and engineers, too many of Israel’s primary and secondary schools are failing to teach their students marketable skills.

Although Israel’s high-tech sector has been its engine of growth in recent years, high-tech entrepreneurs are too focused on exit strategies rather than growing their businesses into successful stand alone firms that create large numbers of domestic jobs, high levels of exports, and sustained investments in future capacity.

Israel also suffers from inefficient public institutions that are all too often tarnished by corruption allegations and stifle the economy with too many regulations and red tape. To some extent, this situation is the result of the ongoing structural changes in the Israeli economy and the move away from state intervention in the economy towards a more market oriented system. This has led the most highly skilled Israelis to seek out opportunities in the private sector. But given the professionalism and general competence of Israel’s military, a modern, well run, professional bureaucracy should be within reach.

Israel’s infrastructure is another constraint on growth. Traffic congestion is perhaps the most visible symptom of the lack of investment in physical infrastructure, but Israel’s ports, railroads, electricity generation and transmission facilities could also use upgrading. In addition, many of Israel’s most disadvantaged residents live in areas poorly served by public transportation and lacking in direct connections to major employment centers. Making it easier for these people to get to and from work could help them reenter the job market.
Finally, Israel is cut off from its hinterlands in the Middle East. While Israel’s foreign relations and the peace process with the Palestinians are outside the scope of this report, it is nonetheless worth emphasizing the huge economic gains that would accompany a regional peace deal. Israel will never achieve its full economic potential as long as it remains cut off from so much of the Middle East. By the same token, the prospective Palestinian state in the West Bank and Gaza will not be a viable entity without strong economic ties to the state of Israel, and without a viable economy, the Palestinians will remain a security risk for Israelis.

The following chapters will examine the economic histories and development strategies of our benchmarking countries, with special emphasis placed on the solutions these countries have found to the constraints on growth mentioned above.
For a country that has enjoyed sovereignty for a grand total of only 38 years, Estonia has a long history as a political, cultural, and economic entity. Apart from a brief period of independence between the world wars, Estonia has spent most of the past thousand years under the rule of foreign powers. Nonetheless, Estonia’s historical legacy left it well-endowed with human capital, which it has used to create and nurture its modern state and economy.

Tallinn, the capital of Estonia, was founded as a trading port between Scandinavia and Russia and by the 13th century was an important member of the Hanseatic League. While the majority of the population, which speaks a Finno-Ugric language, was engaged in small scale agriculture; Baltic Germans would play an important role in the administrative and economic life of Estonia for hundreds of years, controlling the Hanseatic trade and retaining some local administrative control even as the country changed hands between Denmark, Sweden, Poland and Russia over the course of the 16th, 17th and 18th centuries.

Besides the Hanseatic trade, several other important institutions were developed during this period of foreign rule. Lutheranism was adopted as the national religion in the 16th century, and the first university in Estonia was established by the King of Sweden in the city of Tartu in 1632. Much later, when Estonia was part of the USSR, the Soviets placed several high technology research centers in Estonia, including a center for software programming and development that did much of the programming work for the Soviet space program.

Outside of Moscow, Estonia was probably the richest and most developed region of the Soviet Union. Education was highly valued, and Estonians took advantage of the USSR’s many science and engineering programs in the universities. Estonians could watch Finnish television as early as the 1960’s, and Estonians were quick to take advantage of the reforms of the Gorbachev era Perestroika program, expanding trading links with Finland in particular and starting many small businesses.

Following the collapse of the Soviet Union, Estonia was reborn as an independent state. Much of its subsequent economic success has been due to the good choices made in the initial stages of independence. Faced with a blank slate, the Estonians installed young technocrats in key government positions after purging the old apparatchiks. These reformers instituted policies including limited government, balanced budgets, openness to international trade and investment, flat taxes, a currency board, minimal regulation, and clean and efficient regulations and services. A boom in foreign investment (largely from neighboring Finland and Sweden) brought modern management expertise and technologies.
Ethnically, about 2/3 of the population is Estonian, with the rest hailing from areas of the former Soviet Union – mostly Russians and Ukrainians. Non-Estonian ethnicities were not immediately given citizenship after independence, reflecting ongoing Estonian concerns over Russian domination. Since then, however, many of these people have gained Estonian citizenship after taking citizenship classes and passing the language requirement.

**Strategy**

In the waning days of the Soviet Union, Estonia began a series of moves that laid the groundwork for its future independence and economic growth. Taking advantage of the relative openness allowed by Perestroika, Estonians began to open small businesses and open trade and transportation links with Finland and Western Europe. In the late 1980’s the Estonian Supreme Soviet began transforming itself into a real government, passing decrees that reasserted Estonian sovereignty and control over economic matters and establishing Estonian as the official language.

But the challenges facing Estonia were immense. Fifty years of Soviet rule had left Estonia with a relatively well-educated populace, but also a command economy with no market mechanism, no private property, no rule of law, and hopelessly uncompetitive products and industries. One of the most pressing priorities was price reform. Prices for goods and services within the Soviet Union had been set arbitrarily by central planners. If any type of market mechanism was to take hold, first prices had to be freed so the market could determine relative values.

In 1990, before formal independence had been achieved, Estonia launched its price reforms. Very quickly, prices for most consumer goods shot up. This had the perverse effect of causing other regions in the USSR to halt or restrict exports to Estonia, as most of the USSR was suffering from goods shortages and everyone wanted to export to Estonia to take advantage of the higher prices.

At this point, it was not all clear that the Soviets would let Estonia and the rest of the Baltic nations go without a fight. Hardliners within the Politburo and the military were intent on keeping the USSR whole, and violence did in fact flair in Latvia and Lithuania during the winter of 1990-91. Indeed, the attempted coup in August 1991 in Moscow that finally did in the Soviet Union was at least in part motivated by conflicts within the Communist Party over whether or not to let the Baltic republics leave the country.

In any event, the Estonians were quick to seize the initiative. Formal independence was declared on August 20, 1991, and the country set about the task of creating their new country. Throughout the early 1990’s, Estonia faced the unique challenge not just of reforming existing institutions, but of creating and building new ones from scratch. It wasn’t just political institutions that needed to be re-invented, but economic and security institutions as well.

It quickly became apparent to Estonian leaders that if they were to be free to conduct independent policies, certain prerequisites needed to be put in place. High on the list was a stable macro-economic environment and economic institutions that would allow Estonia the freedom to set its own policies free from Russian interference. Several principles were established to achieve these goals and continue to guide Estonian policy to this day. In reaction to years of totalitarian rule, Estonians were eager to make a full break with the past and established the ideals of small government, balanced budgets, and openness to international trade and investment as bedrock principles of their new state.
These principles were important for two reasons. First, they established clearly defined goals that the country could work towards. Second, in the medium term at least, they worked. While not without a few flaws, Estonia’s economic performance since the early 1990’s has been extraordinary, with growth rates outstripping those of other ex-Soviet or Eastern European states, and with much of the growth coming from technology intensive industries.

Of course, principles only go so far, they need to be backed up with specific plans and policies. Moreover, Estonia had to act within the framework of its political and economic situation – many of its policy choices stemmed from necessity. Despite the country’s historical and cultural ties with Scandinavia for example, Nordic style social welfare policies were out of the question for the simple reason that Estonia could not afford them. The country basically had no capital, limited links to the global economy, much of its infrastructure was decaying, and its business and political leaders had a near total lack of familiarity with modern economic and managerial techniques.

Nonetheless, within its limited policy space, Estonia managed to do a lot of things right. Achieving macroeconomic stability was a very important step, but so too was the country’s approach to investment. Instead of using government spending to shore up its transition economy, Estonia ran balanced budgets and encouraged investment by the private sector. While Estonia has been running large current account deficits, much of the capital being imported is going to capital goods that will raise the productive capacity of the Estonian economy. And its low levels of public debt will allow Estonia to keep its tax rates low for the foreseeable future.
After freeing prices, the Estonian government began designing and implementing a privatization plan. At the time, in 1991, former Communist countries were facing a vast array of policy advice from western economists on how to proceed with privatization. Many countries chose to distribute vouchers to their citizens which could then be used to buy stakes in newly privatized companies. But Estonia did not go this
route. With the exception of residential real estate, where vouchers were used as a mechanism to allow families and individuals to purchase the homes or apartments they were living in, Estonia generally privatized its companies for cash. Estonia chose to follow the German Treuhandanstalt program, which had been designed to privatize companies in the former East Germany after unification. Several German advisors came to Tallinn to advise the government, and the state began reorganizing its ministries and state owned companies in preparation for the shift to a market economy.

The first round of the privatization program, in 1991, dealt mostly with small business like shops and restaurants and sold mostly to Estonian citizens. In 1993, the Estonian Privatization Agency was set up to dispose of larger industrial assets. The goal was to find strategic investors with technical and managerial expertise who were willing to make new investments in these operations and transform them into internationally competitive companies. For some firms, it is true, these goals proved impossible. Many companies had lost their traditional markets in the USSR and were turning out products that were hopelessly uncompetitive in a market economy. Still, the government tried to press ahead with privatization wherever possible, and many enterprises were successfully privatized not so much for their production value but for their underlying real estate or other assets.

In some cases, the new owners borrowed from newly set up banks to finance their purchases – putting up the company itself as collateral – sort of like the private equity deals we see so often today. Crucially, though, former company directors were generally not allowed to participate in these auctions, thus limiting the ability of corrupt insiders to loot the companies – as happened too often in Russia and elsewhere.

Subsequent privatizations, however, focused much more on bringing in foreign ownership that could provide management expertise, access to modern technologies, and investment capital. Crucially, Estonia had prepared the ground for this strategy by opening up its capital account, introducing a freely convertible currency backed by a currency board and pegged to the Deutsche Mark, and creating a simple tax and regulatory environment friendly to foreign investment.

Currency Reform

Estonia had one of the most successful currency reforms anywhere when it launched the new Kroon to replace the Ruble in 1992. At the time, Estonia was suffering from 100% inflation every month and was in any case eager to cut all remaining ties with Russia. Despite the hyperinflation and economic chaos stemming from the collapse of the Soviet Union, Estonia’s currency reform was an act of real courage and leadership on the part of the Estonian government – the IMF actually opposed the introduction of a new currency because it feared the country did not have the institutional strength to manage the transition.

There was also a more immediate impediment to launching its own currency – where would the money come from? In a quirk of history, Estonia had managed to set up a government in exile soon after the Soviet invasion of 1941 ended their brief run at independence. As a sovereign country in between the world wars, Estonia had of course managed its own currency. As a consequence, the central bank had deposited gold and hard currency reserves at several other central banks around Europe and at the Bank for International Settlements in Geneva. Somehow, the Estonian government in exile had managed to convince the central banks of the UK, Sweden and the Bank for International Settlements to retain these gold and foreign exchange reserves until a sovereign Estonia could reclaim them.

Thus, in 1992, the newly formed Bank of Estonia was able to draw on these reserves to launch its new currency – the kroon. Currency boards are especially effective at curbing inflation, which Estonia and the rest of the ruble zone were suffering from at the time as monthly prices were rising at the rate of over 100%
a month. They do so by restricting the growth of the domestic money supply by ensuring that central banks only issue currency that is backed up by an equivalent amount of hard currency reserves at a set ratio. At launch, the kroon was pegged to the Deutsche mark (the peg would later be changed to the Euro after the launch of the single currency and the disappearance of the DM) and within a few years had achieved a measure of price stability.

At the same time, Estonia freed its capital account, making the Kroon fully convertible and easing the way for foreign investment. Foreign funds and corporations could now participate in Estonia’s privatization process (and hedge their exposure to Estonian risk) through the normal channels of the capital markets. The result of all this was macroeconomic stability, the ability to pursue an independent monetary policy (independent of Russia that is, Estonia was now tied ever more closely to Western Europe through its currency peg), a huge wave of foreign direct investment, and a boom in foreign trade.

Foreign Investment

The massive involvement of Finnish and Swedish investment in the Estonian economy has been a huge benefit to the economy as a whole and has allowed the country to rapidly import new technologies, modern management practices, and lots of investment capital. More subtly, FDI has also allowed Estonia to free ride off of many of the investments in high technology and R&D already made in Sweden and Finland. While Estonia does not have the domestic resources to create institutions like Tekes and Sitra in Finland or match the corporate R&D spending of giants like Ericsson and Volvo in Sweden, the integration of Estonia into Nordic supply chains and the recruitment of Estonian programmers and engineers into western companies has allowed the country to take advantage of previous Nordic investments in innovation and enter the international economy with some of the most up to date and sophisticated technologies available.

While much of the credit for Estonia’s economic success must thus be due to the heavy involvement of its Nordic neighbors, Estonians deserve much of the credit for allowing and encouraging this investment to take place. In contrast to many other ex-Soviet satellites, Estonia’s privatization process was not marred by undue levels of corruption. Privatization in several sectors – notably the telecommunications sector,
expressly targeted foreign investment and expertise, and the country did not aim to maintain domestic control over privatized companies through the use of vouchers (which were not used at all in the process of industrial privatization.)

In addition, Estonia’s simple, straightforward, and low tax regime helped encourage foreign investment, and so too did its currency board – which went a long way towards eliminating currency risk and promoting fiscal responsibility. Estonia also opened its economy up to international trade and freed up prices early on, creating an environment where businesses could prosper.

### Tax Structure

Estonia is known for its simple, straightforward, and low-tax regime. Estonia’s first post-independence tax code ran to roughly 20 pages in length, established a flat tax scheme with no exemptions, and abolished all international trade tariffs. While the tax code has since been amended several times and in the case of tariffs changed to match EU rules, it is still relatively simple and straightforward. And while the tax system has perhaps impeded job growth for tax accountants and lawyers, it has contributed to the international competitiveness of the Estonian economy and the speed and efficiency of certain public services in the country.

The flat income tax rate of 22% applies to both individuals and corporations, and there is no tax on reinvested earnings. In general, there is no preferential treatment under the tax regime, which means that there are no exemptions and no exceptions.
Last year, 83% of Estonians filed their taxes online. It takes about 20 minutes on average to complete the process and no papers are involved – it is entirely electronic. If you are owed money, the state must pay you within two weeks; usually the check is deposited directly in your bank account electronically.

Telecoms

One of the major building blocks of Estonia’s subsequent successes was the privatization of the Estonian telecommunications sector. Telecommunications is important not only because it is a potentially large and profitable industry in its own right, but because it is a crucial part of any modern economy’s infrastructure. Digital voice and data networks act as the ‘central nervous system’ of the economy. Creating and sustaining other high technology industries – be they software, bio-tech, or what have you, are dependent upon an underlying fast, reliable, and affordable telecommunications infrastructure. In this respect, Estonia even managed to turn one of its weaknesses – an outmoded and decaying communications system – into a strength. It did so by bringing in foreign investors who, by investing heavily in the sector, managed to leapfrog many more developed countries by installing the latest, most cutting edge communications technologies and bringing mobile phone and internet connectivity rates rapidly up to and beyond the levels in many western countries.

During the Soviet era, the state telecommunications company had a monopoly on all telecom services and was run by the Ministry of Communications. In 1991, the Ministry of Communications was folded into the new Ministry of Transport and Communications and Eesti Telekom, the state telecom operator, was restructured. In 1992, a 49% stake in Eesti Telekom was sold to Telia of Sweden and Telecom Finland (these two companies have since merged to become TeliaSonera – the largest telecom operator in the Nordic and Baltic region). Concurrently, Telia and Telecom Finland also bought a 49% stake in Eesti
Mobile Telefon, a mobile phone operator. In 1999, the state sold a further 24% of the company to private investors. Today, although the state still retains a 27% stake in Eesti Telekom, the company is controlled by TeliaSonera and private investors.

One of the first big projects undertaken by the newly privatized firm was the installation of a fully digitized voice and data network throughout the country. By drawing in strategic investors from the west, Estonia managed to upgrade its telecommunications facilities much faster, and to a much higher standard, than would have been possible by just relying on domestic resources. Today, nearly 16% of Estonian households are wired for broadband internet connections, a higher rate than in the US, Germany, Italy, and many other developed countries.

So many of Estonia’s subsequent policy innovations and economic developments were dependent on getting its telecommunications sector up and running that it is worth reviewing all the developments that it led to. Many of Estonia’s public sector reforms – from electronic identity cards to various online services like tax returns, business registrations, e-voting and the like would simply have been impossible without widely deployed high-speed data networks. The economic benefits of telecom modernization accrued to Estonia in two broad ways. First, the country began to sub-contract manufacturing facilities for Nokia of Finland and Ericsson of Sweden, turning out mobile phones and other electronic devices for both the domestic market and for export. Second, the improved infrastructure allowed a host of software companies and service providers to set up shop.

**Public Sector Reforms**

One notable aspect of the Estonian experience is that it managed to maintain a high degree of policy continuity and consensus despite being saddled with a series of short-lived coalition governments. There was no single leader, a la Lee Kuan Yew in Singapore, to drive the transformation and lead Estonia into the future. Instead, Estonia has been governed by a series of short lived coalition governments that, despite frequent changes in personnel, managed to agree on many basic policy goals and strategies. In part, this reflected the high degree of optimism and responsibility that accompanied independence after so many years of Soviet domination. It also reflected the political landscape in Estonia, where the left-right divide does not correspond to those of Western Europe or the United States. In Estonia, political cleavages are based on what happened during the Soviet occupation. Those who joined the Communist Party or served in senior administrative positions in the Soviet era belong to one set of parties, while dissidents and reformers set up their own parties. Thus, social democrats and liberals (in the free market sense of the term) are in fact natural allies in Estonia, as both of these parties are free from any taint of collaboration during the Soviet era.

But Estonia’s public sector reform program also depended on a decision to de-politicize the bureaucracy that was made during the government of Prime Minister Mart Laar. After purging the ministries of the nomenklatura who had worked under the Soviets, the government hired ambitious young technocrats untainted by the past and unaffiliated with specific political parties. They also cut by one-third the size of the bureaucracy at all levels, eliminating ministerial posts as well as staff positions. Finally, the government took aim at one of the most pernicious legacies of Soviet rule – widespread corruption. In this regard, the principle of small government became an important tool in this fight. While watchdogs and anti-corruption laws were important tools in curbing corruption, Estonia also aimed at reducing the opportunities for corruption, which means having fewer and simpler regulations wherever possible, and making sure that remaining rules and regulations are administered in a clear and transparent way.
By eliminating the need for unnecessary bureaucratic licenses, approvals, stamps and the like, the opportunities for officials to extort bribes or gifts were much reduced. No less important was the movement of many procedural tasks to the internet, reducing the need for paperwork and ensuring that accurate and open records of these procedures were freely available.

Internet voting, tax filings, and business registrations, for example, can all take place on the internet, and are extremely efficient and corruption free. Estonian identity cards, for example, come embedded with a computer chip that contains security-encoded information on the user. Most Estonian computers have a built in credit card swipe on their keyboards that can read the identity cards and, along with a couple of extra passwords, allow access to secure web-based transactions like voting or paying taxes.

Filing your taxes online, for example, usually takes no more than 20 minutes and often as little as five. Once you have logged in to the system, calculating your taxes is simple because your earning statements have already been electronically submitted to the tax authorities, and the flat tax rates with very few deductions allows automated software to accurately calculate your tax returns within seconds. Most filers simply click ‘ok,’ when prompted to accept or appeal their tax return as calculated by the computer. Then, taxpayers will get any returns owed to them automatically wired to their bank accounts electronically, or do the same in reverse if they owe money.
In addition to the efficiency gains, because no human beings touch any of the ‘papers’ being submitted to these online services and the results are transparent, the opportunities for corruption are that much lower. As Mart Laar, former Prime Minister of Estonia and current Member of Parliament put it, “the fewer and simpler regulations you have, the less opportunity bureaucrats have to extort money.”
A catchy but apocryphal story about the Estonian political and economic reforms is that they were inspired by and attempted to follow the precepts laid out in Milton Friedman’s *Capitalism and Freedom*. Thus their emphasis on low taxes, free trade, and small government. In fact, although the Estonians were inspired by their experience with the Soviet Union to embrace certain libertarian principles, the source of much of Estonia’s legal framework and public policies was the European Union. Early on, Estonia viewed EU membership as crucial, not simply in terms of access to the single market, but as a source of its judicial code and public policies and (not least) as a guarantor if its security. Moreover, the process of joining the EU entails a certain amount of diligence and responsibility – it provides a tangible set of goals to aspire to, but also the threat of rejection if the goals are not achieved.

A prerequisite of accession to the EU is compliance with the Copenhagen Criteria. These rules include political, economic and legislative criteria that generally state that an accession candidate must be a secular democracy with a functioning market economy governed according to the rule of law and with all the associated freedoms and institutions.

Furthermore, an accession country must also adopt the Acquis Communauté – the full body of EU law that has been passed thus far. In some cases, Estonia had to adopt less liberal policies than it had previously enacted in order to comply with EU rules. It had to adopt the EU’s common tariff policy for example, after totally eliminating tariffs on trade previously. But in general, the adoption of EU law was a huge boon to Estonia. In particular, it encouraged foreign investment by assuring investors that the ‘rules of the game’ would not be changed arbitrarily down the road by new governments.

While much of the heavy lifting was completed before EU accession, once EU membership has been achieved, the Maastricht criteria and the Stability and Growth pact apply. These rules act as an important constraint on the Estonian political class to retain sensible fiscal and monetary policies.

Another important positive benefit stemming from joining the EU is the availability of structural adjustment funds. Between 2004 and 2006, Estonia received over €695m from the EU – which is significant in a country of only 1.3 million people. Estonia identified five main areas to invest the money. First, Estonia identified several strengths and weaknesses in its economy and strove to use the structural funds to overcome its weaknesses. Note that structural funds are not restricted to basic infrastructure projects but can be used to encourage innovation and the growth of human capital.

First, Estonia identified a gap between the skills of its workforce and those in demand in the labor market. As such, it decided to invest a portion of the structural funds in education, particularly in life long learning for adults and vocational schools that could train people with the specific skills demanded by the labor market.

Second, Estonia took steps to improve the long term competitiveness of its business sector and increase the effectiveness of commercial R&D programs. While Estonia has many skilled scientists and engineers, it does not have a tradition of supporting commercial R&D or supporting links between the universities and the private sector. Small and medium sized businesses in particular often need help in taking their innovative ideas and turning them into commercially viable products. So Estonia developed a program to assist SME’s in areas like management expertise, access to funding, and links with universities and other research centers.
Third, economic growth in Estonia since independence has been much more pronounced in Tallinn and other urban areas than in the countryside and outlying regions. A special agricultural and rural development program was launched to improve infrastructure and transport links within the country and improve processing and marketing facilities within the agriculture and forestry sectors.

Fourth, transportation and environmental infrastructure were identified as being in need of investment. Every transportation sector – from roads and railways to seaports and airports, received some EU funding. Estonia also funded improved waste and water treatments and began supporting a few sustainable energy projects. Finally, a portion of the structural funds were set aside for technical assistance.

Education

Perhaps the only positive legacy of the Soviet occupation of Estonia was the high level of educational attainment achieved by Estonians. The USSR was generally quite good at turning out engineers, mathematicians and scientists, and as mentioned above, placed several high technology research centers in Estonia to support its space program and military industrial complex.

Still, with the collapse of the USSR, funding, and indeed the raison d’etre for these institutions disappeared. And while Estonia has left with a relatively high stock of human capital, its universities and research institutes suffered from outdated infrastructure and facilities and were inexperienced with and unconnected to commercial research and development projects. Compounding these problems was the fact the best educated and most highly skilled Estonians were now able to seek work international, resulting in a brain drain of some of the best and brightest in Estonia.

At first, the government focused on improving primary and secondary education. Of particular interest was the ‘Tiger Leap’ program initiated by the government in 1996. The goals of the Tiger Leap program included placing computers in every Estonian school (with the aim of installing one computer for every 20 students), connecting schools with the internet, training teachers to use computers and new technologies, connecting the Estonian educational system with international network and bringing international standards into Estonia, developing a computer sciences curriculum, and encouraging the development of Estonian language software.

Due to its initial success, Tiger Leap has since expanded to become a broad program aimed at improving the nation’s ICT infrastructure and importing innovative high technology best practices throughout Estonia’s educational system. That said, while the quality of Estonian primary and secondary education is quite good, it is another story at the university level.

Although the government subsidizes university education, students still pay roughly one-third of the total tuition costs. Approximately 55-60% of secondary school students go on to university.

Ethnic Minorities and Relations with Russia

Only two thirds of Estonia’s population of 1.4 million people are ethnic Estonians. The rest are mostly Russians and Ukrainians who moved to Estonia during the Soviet occupation. These ethnic minorities have not been particularly well integrated since independence, reflecting Estonian sensitivity over Russian influence and uncertainty over how to integrate these people into the Estonian nation. At the outset of
independence, Russian speakers were not automatically granted Estonian citizenship. Estonia maintains language and civics requirements to this day that have kept a large number of Russian speakers from gaining citizenship – roughly half of these people, mainly the younger generations, have passed the tests, while the rest hold Russian citizenship or are technically stateless. Differences over how to interpret the historical events of the 20th century have also added to the tension between ethnic Estonians and Russians, most notably when the Estonian government’s decision to remove a war memorial honoring Soviet troops who fought in World War II from a prominent location in Tallinn sparked riots that left one dead and hundreds injured.

Estonia was quite literally placed between a rock and a hard place during World War II, being conquered and occupied by both Russian (twice) and German forces during the course of the war. Estonian men were recruited (sometimes forcibly) to fight on both sides during the conflict, and the war of course ended with Estonia’s incorporation into the Soviet Union.

Estonia’s relationship with its ethnic minorities is particularly sensitive because of its impact on Estonia’s bilateral relationship with Russia. Not only does Russia pose a potential security threat to Estonia, Russia also casts an economic shadow over the country. Russian exports and imports are an important source of economic growth in Estonia, as these goods are often transshipped through Estonia. Moreover, despite Estonia’s efforts to shift its economic focus to the west and the European Union, Russia still represents an important economic opportunity for the country going forward. Estonia’s full economic potential will never be realized unless it settles some of the outstanding irritants in its relationship with Russia – its treatment of minorities especially.

Estonia has good rail connections with Russia, and as European demand for Russian oil and gas has run into pipeline capacity constraints and problems with Ukrainian and Belarusian transshipments, Estonian railways and ports have benefited from a surge in Russian energy exports. By some estimates, Estonia’s transshipment trade with Russia accounts for 8% of its GDP, and the country is investing in new ports, customs facilities and other transportation infrastructure to meet growing demand and congestion.

Lessons for Israel

Estonia’s achievements offer three broad lessons for Israel. First, Estonia’s public sector is notable for its transparency, lack of corruption, and efficient provision of public services. Technology has played an important role here – a state of the art telecommunications infrastructure has allowed the roll-out of a host of electronic services that are quick and easy to use and reduce the opportunities available for corruption. Estonia’s flat tax rate and relatively simple tax regime are a competitive boon to business. The appointment of competent technocrats to key positions has helped to de-politicize the bureaucracy and implement pro-growth economic policies. And most importantly, the country embraced revolutionary structural reforms that transformed every sector of the economy and afforded entrepreneurs and skilled workers the opportunity to create new jobs, firms, and profits.

Second, accession to the EU forced Estonia to implement the Acquis Communautaire – the full body of EU laws, which provided a readymade template for Estonia’s judicial framework and a model of best practices in terms of legislation and public policies. EU experts have been made available to the Estonians to advise on everything from legal standards to industry regulation to investment programs. The EU’s structural funds are an important source of capital in Estonia, and the country is using the funds not just to improve basic infrastructure, but is taking a holistic approach to raise the competitiveness of the Estonian economy as a whole, investing in new R&D facilities and innovation that will contribute to the productive capacity and value-added of the Estonian economy for many years to come. In addition, access to the single market and
the adoption of EU technical standards and regulations have allowed Estonian business to prosper despite the lack of a large domestic market.

Finally, Estonia’s embrace of foreign investment has allowed it to import capital, technologies and management practices from abroad that were lacking in the country. Estonia’s Nordic neighbors have invested heavily in the country’s telecommunications infrastructure and manufacturing sector, both providing economic growth and allowing Estonia to ‘free-ride’ on the innovation and high tech investments they have previously made. It should also be noted that tourism, especially from the Nordic countries, has been a big source of job growth for the less skilled sectors of the Estonian population, helping to keep labor force participation rates high and smoothing the transition from a communist system to a capitalist economy.
Background

At the beginning of the 1990’s, the Finnish economy was notable, if it was noted at all, for the severity of the recession engulfing the country and the collapse of its traditional forestry and metals industries. But by the end of the decade, no discussion of high-tech innovation, ICT, or economic competitiveness was complete without a mention of Finland and the extraordinary economic turnaround it had engineered in a few short years.

Much of Finland’s recovery was due to the explosive growth of Nokia, which by now has become synonymous with mobile phones and is the champion of the Finnish business sector. Nokia was blessed with an exceptional management team lead by Jorma Ollila, which foresaw the huge commercial potential of wireless communications and strategically positioned Nokia to capitalize on this promise. But Nokia did not just happen to find itself in the right place at the right time to lead the global telecommunications revolution through prescient management or sheer luck. In fact, the seeds of Nokia’s success had been planted years earlier in the economic development strategies put forward by the Finnish state.

Moreover, it would be a mistake to assume that Nokia was solely responsible for Finland’s economic turnaround. Starting in the 1980’s, Finland started implementing a series of structural reforms that liberalized the financial sector, joined the European Monetary Union, reoriented the country away from the Soviet Union and towards Europe, and most importantly, began using state money and institutions to invest in high technology and innovation.

Despite the hardships of the recession in the early 90’s, Finland had a lot of strengths to build upon. Taking its cue from Sweden and the other Nordic countries, Finland had built up a strong social welfare state and made large investments in education, health and infrastructure. Its stock of human capital was very high, its political institutions were strong, transparent and free from corruption, its social welfare programs shielded laid off workers from destitution, and its infrastructure was in good shape. Even if the immediate challenges of getting its economy back in gear were high, Finland’s endowment of human and physical capital, built up over many years, gave it the relative luxury of planning and implementing a coherent turnaround strategy.

Finland gained its independence only in 1917, after a long history as a dependency of first Sweden and then Russia. However, it had to fight three separate wars with the Soviets (in 1917, 1939, and 1941-45) in order to maintain its sovereignty, and then had to operate under a delicate status of neutrality until the Soviet Union collapsed. In the early years of the Cold War it could not join any western European economic or
security institutions, and was forced to pay reparations to the Soviets for damages inflicted during the fighting in World War II. Finland maintained an important trading relationship with the Soviet Union up until its collapse.

Finland is one of the most ethnically homogenous countries in the world, which is reinforced by its remote geographic locations, and the fact that the Finnish language is unrelated to other Indo-European languages (not to mention the weather). For most of its history, the Finnish economy has been agrarian and heavily dependent on forestry. But over the past forty years, Finland has developed one of the world’s most advanced high tech economies. These achievements in high technology have accrued largely since the early 1990’s, though the seeds of the current high-tech boom were planted well before then in the 1950’s and 60’s. But the events of the early 1990’s were an important turning point. The collapse of the Soviet Union meant that Finland essentially lost its main export market, and the ensuing economic crisis was severe.

**Recession**

The recession Finland experienced in the early 1990’s was deep, destabilizing, but also liberating. It brought severe hardships to the Finnish economy but within the crisis lay the seeds of Finland’s modern high tech economy.

From 1990 through 1993, Finnish GDP in real terms declined by more than 10% and the unemployment rate rose from just over 3% in 1990 to nearly 20%. The country was in the midst of a ‘perfect storm’ of economic calamities – the Soviet Union, with which Finland had conducted an extensive barter trade, was in collapse; the forestry sector, the traditional backbone of the Finnish economy and a major employer and exporter, entered an era of restructuring due to international competition; and the financial sector, which had been liberalized in the late 1980’s, had produced a credit expansion and asset bubble that proved unsustainable and burst at the worst possible time. Compounding matters, the welfare state that Finland had built up over the past several decades was too rigid to cope with the profound changes rocking the Finnish economy and threatened to strangle any recovery before it got started.
As in Sweden, of crucial importance was regaining macroeconomic stability. The financial sector was in very bad shape; both the public sector and many corporations were struggling under heavy debt loads; the currency was collapsing and real interest rates were extremely high. At first, the Finns tried to stave off a devaluation of the Markka by pegging it to the ECU – the European Currency Unit that was the precursor to the single currency. But it soon became clear that the peg was untenable and the Markka was floated, immediately losing 12% of its value. The devaluation did help to restore some of Finland’s export competitiveness, but the structural changes the economy underwent were the main drivers of the recovery.

**Budget Deficit-Surplus - Finland**

**Finland’s Innovation System**

The Finnish state has been extremely proactive and forward thinking with regards to innovation policy and economic competitiveness. Of all the countries in our study, post-war Finland has been perhaps the most successful in creating human capital and then harnessing those skills and creating new technologies and industries. In Finland, this success has not been due to luck or the importation of foreign skills and investment (although these two factors haven’t hurt). Rather, the Finnish state has actively promoted the development of modern industries and created a culture of innovation through a series of public policies and institutions that have transformed Finnish society from a largely agrarian and natural resource-based economy to one of the most modern and competitive high tech economies in the world.

Post war Finnish economic development can be characterized as having gone through three distinct phases. In the initial aftermath of the war, Finland was compelled to pay the Soviet Union reparations for its invasion of Soviet territory and collaboration with the Germans in the early stages of the war. But the Soviets did not want money – as cash had little value in a Communist state. Instead, the Soviets wanted
industrial goods. This was a problem for Finland, in that it was a poor country that could hardly afford to make large restitution payments, but also because Finland was not really an industrialized economy at this point and had very little to offer the Soviets. What little modern business existed was mostly concentrated in the pulp and paper industry.

But the Finns took this hardship and transformed it into an opportunity. Finland embarked on a crash course program of industrialization – it mobilized its savings and the government created a lot of tax and other incentives to invest in new infrastructure, factories and shipyards. Moreover, the Russians weren’t exactly customers in the free market sense of the term. They did not demand the industrial goods delivered as reparations by the Finns meet international standards of quality and sophistication, which allowed Finnish engineering and manufacturing industries to slowly improve their skills and technology without competing against established western firms.

In any event, this era of Finnish economic development was characterized by strong state intervention in the economy – the modern vestiges of a social welfare state were established, with large sums being invested in education and health. Savings and investment were channeled by the government to favored industries, and much of the country’s basic infrastructure was built or improved. The country’s energy sector also experienced strong growth during this period, with Finland establishing both nuclear generating facilities (utilizing Swedish and Russian reactor designs), and an extensive bio-mass generating capacity centered around the forestry sector’s pulp and paper mills.

Finland’s labor unions expanded markedly during the 1950’s and 60’s – with the unionized percentage of the workforce rising from 40% to roughly 80% - helped by state encouragement and the development of centralized wage negotiations between labor and the Confederation of Finnish Industry that (with the state acting as a mediator and go-between) continues to this day.

By the 1970’s, this initial phase of industrialization was beginning to run out of steam as the oil shocks and increasingly high inflation rates began to upset Finnish macroeconomic stability. A series of devaluations of...
the Finnish Markka kept the forestry industry internationally competitive (it still accounted for a huge proportion –TKTK% - of Finnish GDP at the time), but were otherwise destabilizing. Finns began seeking new solutions to the challenges of economic development and formed a special government committee including government, labor and business leaders to examine Finland’s global competitiveness and suggest a comprehensive strategy for future development. The committee decided to adopt a ‘high-technology strategy,’ and the country set about building and expanding the infrastructure and institutions necessary to pursue basic research, commercial development and innovation.

The government changed an existing law that had banned collaboration between universities and the private sector and began promoting cooperation. Several new trade deals were agreed with the European Union and the Nordic countries and Finland moved to begin reducing its dependence on the Soviet Union. Spending on education and R&D increased sharply, and the country created two new public institutions to provide funding and support for Finnish innovation.

Sitra was founded in 1967 as the ‘Finnish Innovation Fund’ with an endowment of FM100 million to invest in technological research and development, particularly in the fields of electronics and energy. In 1983 Tekes, a state agency for funding technology R&D was established. The formation of Tekes led to a clarification and refocusing of Sitra’s mission: Sitra evolved into a sort of public venture capitalist, funding not R&D programs but specific start up companies. In addition, it published research and policy papers on innovation and the promotion of high-technology in the Finnish economy.

### Finnish Manufacturing Employment

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<tbody>
<tr>
<td>Textile, clothing and leather product industries</td>
<td>23,700</td>
<td>45,300</td>
<td>82,500</td>
<td>81,400</td>
<td>34,100</td>
<td>16,800</td>
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<tr>
<td>Saw-milling and other timber industries</td>
<td>47,800</td>
<td>48,900</td>
<td>59,000</td>
<td>66,600</td>
<td>38,800</td>
<td>31,800</td>
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<tr>
<td>Paper and pulp industries</td>
<td>16,200</td>
<td>22,900</td>
<td>39,500</td>
<td>56,600</td>
<td>46,200</td>
<td>39,000</td>
</tr>
<tr>
<td>Metal industries*</td>
<td>22,500</td>
<td>43,600</td>
<td>97,300</td>
<td>153,100</td>
<td>148,400</td>
<td>145,400</td>
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<td>Electric and electronic appliance industries</td>
<td>. .</td>
<td>19,400</td>
<td>37,200</td>
<td>42,100</td>
<td>69,000</td>
<td></td>
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<tr>
<td>Other industries</td>
<td>38,500</td>
<td>60,700</td>
<td>112,700</td>
<td>171,000</td>
<td>194,300</td>
<td>157,100</td>
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<td>Manufacturing industry total</td>
<td>148,700</td>
<td>221,400</td>
<td>410,400</td>
<td>565,300</td>
<td>503,900</td>
<td>459,100</td>
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* Includes electric and electronic appliance industries in 1925 and in 1938.

Sources: Hjerpe, Reino et al. (1976); Statistics Finland’s National Accounts Database.

Structural reforms were also begun. The Finnish state began divesting public holdings in a few big engineering, chemicals, and wood processing firms and promoting private sector investment in the economy. The telecommunications sector was opened up and the Finnish government, in tandem with other Nordic governments, adopted a series of technical standards that opened up wireless communications for sustained growth. Financial markets were liberalized, and the country experienced a wave of foreign investment as existing industries were restructured and new businesses, especially in the ICT sector, grew. As the chart below shows, these reforms resulted in a significant shift in the relative employment levels of Finnish industry.
Besides the structural reforms, another important element in the transformation of the Finnish economy was the cooperation of the labor unions. The 1980’s had been a period of relatively high labor strife by Finnish standards, with workers in the traditional sectors demanding high pay increases and other benefits, and often going on strike to achieve their goals. But the severity of the recession in the early 90’s convinced the unions to moderate their wage demands and job protections and work together with the state and the private sector to rebuild the economy.

The Finnish Innovation System

As mentioned above, one can conceptualize Finnish post-war economic development as having progressed through three distinct phases: from industrialization through technological development through the current phase of innovation. Each of these phases was, to varying degrees, part of a coherent strategy that was carried out by the government in conjunction with academia and the private sector. One of the keys to Finland’s success is the framework within which Finland’s economic development strategy is defined, planned and implemented. Finland’s ‘Innovation System’ promotes consensus and cooperation during all three stages of strategy development, and ensures that the resources of the country are focused on achievable goals and allocated efficiently.

The effectiveness of Finland’s strategic planning has been enhanced by ability of the country’s business and political leaders to conceive of the different sectors of the economy and public sector not as isolated pieces but as integrated parts of a system. Finland’s strong growth in ICT, for example, depended on a confluence of factors: government funding of education ensured that the country had a strong base of well educated engineers and scientists; Finland’s openness to international trade, its membership in the EFTA and later the EU provided a large market to sell into; the establishment of first a Nordic and then an EU-wide technical standard for wireless communications gave Finnish firms first-mover advantages in the sector; and finally funding from state agencies like Tekes, Sitra and the Academy of Finland pushed R&D work along and helped to establish the country as a center of ICT innovation.
In addition, taking a holistic approach to innovation systems means not dismissing ‘low-tech’ areas of the economy out of hand. Sometimes low-value added manufacturing operations, for example, play an important role in contributing to the strength and breadth of a particular cluster. Innovation is about improving processes and operations as much as it is about inventing new products and technologies. Thus, maintaining a domestic assembly line might be important because of the R&D or testing work that the line supports. Finland has taken pains to ensure that its grants and R&D funding programs take a broad view of the impact of new processes and technologies on the economy and ensure that traditional industries keep on innovating to maintain competitiveness.

The command center for Finnish innovation policy is the Science and Technology Policy Council. The Council is an advisory body for the government that is chaired directly by the Prime Minister and also includes key cabinet ministers (in particular the Education and Trade and Industry Ministers who serve as vice-chairs of the Council) and senior representatives from academia, private industry and labor. Senior representatives of Tekes and the Academy of Finland also have seats on the Council. The Council provides an informal space for interactions among all the players in the system to reach consensus on important policy goals and the methods for achieving these goals.

Many of the most important initiatives of Finnish innovation policy have emanated from the Council – the decision to create Tekes, the plan to boost national R&D investment, many university level science and technology programs, and many regulatory reforms and liberalizations have been planned and implemented through the Council.

**Tekes**

Tekes, the state agency for funding R&D activities, was founded in 1983 with a mandate to support innovation in the ICT sector and to create a series of national technology projects that involved academia, industry and some government ministries. While Tekes reports to the Ministry of Trade and Industry, it is
Tekes was an independent agency with substantial autonomy – Tekes alone makes its funding decisions. Soon after it began operating, it created a competitive process of bidding for research grants that included both peer review and an analysis of the project’s overall impact on the Finnish economy. Tekes tried to support projects that had the potential for export success, job creation, productivity and value-added increases, and spillover effects on the surrounding communities and industrial clusters.

Tekes' competitive bidding process aimed for a 50/50 split between government and private funding sources, ensuring that corporations would have an important stake in the success of the programs, but Tekes would fund projects everywhere from universities to large corporations to small and medium sized businesses. Tekes did not and does not take equity stakes in any of the companies or projects it invests in, but it does give out either grants or loans that must be repaid with the proceeds of the commercial application of the work.

Tekes has played a role in the technology R&D programs of every major Finnish company (including Nokia) since its founding. Tekes has different funding criteria depending on whether the R&D proposal covers basic research or aimed at later stage commercial development. In either case, Tekes will only fund a portion of the project’s total cost, ensuring that the firm has a stake in a successful outcome. Basic research is usually funded with a grant, but loans, which must be repaid, become more important as the technology...
gets closer to commercial application, and the potential for earning a return on the R&D becomes more viable.

In the first years, Tekes’ budget was only around €10 million annually. And even as Tekes’ budget and staff have grown substantially since it was first founded, the institution has tried to remain relatively small and nimble. It has just over 300 permanent staff and is constantly reevaluating its methods and effectiveness. Nonetheless, Tekes has been criticized for spreading its resources too widely. Over 60% of its funding goes to SME’s, and last year, for example, Tekes made over €466 million in investments, but to 2,157 different projects, resulting in an average funding size of only €216,000.
Education

The Finnish education sector is consistently ranked as one of the best in the world. Finnish students score highly in the PISA tests and the World Economic Forum ranked Finland number one in the world in terms of the overall quality of its educational system. In 2003, Finnish students earned a mean score of 539 on the PISA math test, well above the OECD average of 496 and behind only Switzerland, Japan, Korea and Hong Kong. In the science test, Finland earned a score of 548, above the average of 500, and first overall out of all participating countries. As these scores suggest, the real strength of Finland’s educational system lies in its primary and secondary schools. Basic education begins at age seven and is free for all.

Until the students reach the age of 16, everyone attends the same type of ‘comprehensive school’ that teach the same curriculum. Languages are an important component of the Finnish curriculum, and foreign language instruction begins early – all third graders must be studying at least one foreign language, but instruction often begins earlier and may include more than one foreign language at a time. Because both Finnish and Swedish are officially recognized languages in Finland, all students must obtain at least a proficiency in both. In addition, another foreign language is required. Most Finnish students learn English, but some study (sometimes in addition to English) German, French or Russian.

At 16, tracking begins, with students able to choose between college preparatory and vocational upper schools. Unlike Sweden, the courses and curriculums at vocational and college prep schools are substantially different. Graduation from the college prep schools, but not the vocational schools, requires passing a matriculation exam that is a prerequisite for further study. The results of the matriculation exam are often used as a basis for entrance into the universities, as the exam was originally based on the entrance exam for Helsinki University.
Finland’s teachers enjoy a high reputation and there is significant competition among students to enter education degree programs in Finnish universities. In 2005, only 13% of applicants were accepted into Finnish teacher training programs.

Finland’s higher education system is divided between research universities and polytechnics that are more practice oriented. Although the polytechnics do not have PhD programs, they often enjoy close ties to industry and participate in cooperative programs with the private sector to ensure they are turning out students with skills that meet labor market demands. Most of the polytechnic schools are owned and run by local municipalities (there are a couple of privately owned schools) and are free of charge. All of Finland’s universities are state owned and there are no tuition fees for students (including foreigners). The state also provides housing grants and student loans to cover living expenses for many students.

In general in higher education, Finland has done a very good job of promoting science and engineering degree programs and fostering links between academia and the private sector, but still has room for improvement in terms of the overall quality and international competitiveness of its universities. As late as 1960, Finland had full universities in only two cities. The country then embarked on a major expansion program that saw the university system grow to 20 institutions in ten cities across Finland. Overall funding levels were increased substantially and the Academy of Finland was reorganized under the Ministry of Education to help oversee the expansion.

![Finnish University Funding By Source](image)

But while the expansion of universities was very successful in increasing the numbers of Finns receiving a tertiary level education, it created universities that were relatively small by international standards and often too small or specialized to achieve the critical mass and interdisciplinary collaboration that mark the world’s best research universities. One effort to improve the stature of Finland’s universities involves a plan to merge three specialized universities in Helsinki to create one large institution with the breadth and depth necessary to promote interdisciplinary research and stand on its own as one of the best universities in the world. The Helsinki Institute of Technology, the Helsinki University of Art and Design, and the Helsinki School of Economics and Business Administration was all be rolled into a single entity – an ‘innovation university’ in the words of the plans’ boosters. This merger will likely be mimicked in other areas of Finnish higher education, as the Ministry of Education is eyeing increased cooperation among universities in close proximity to one another, and among polytechnics that teach complementary subjects.
The main funding body for scientific research and is the Academy of Finland, which is a part of the Ministry of Education and also helps to devise the country’s science policy. The Academy runs four ‘research councils’ that are staffed by 10 leading academics from their respective fields. The four councils cover: Culture and Society; Natural Sciences and Engineering; Health; and Biosciences and the Environment. In general, each council aims to identify specific subjects or areas, and then creates a program to fund a series of research projects within that field. One of the more successful recent programs was the ‘Telectronics’ program which ran from 1998-2003 and disbursed over €7.7 million. The program covered both telecommunications software and hardware, techniques for broadband data transfer, and issues in telecommunications manufacturing supply chains.

Finland also maintains adult education programs that help retrain workers displaced by job losses, or simply ‘up-skill’ individuals seeking to improve their careers. Adult education students can take courses either at specialized adult education centers, at universities, or at vocational or polytechnic schools. Finland’s adult education participation rates are skewed upwards because it includes some types of education – like Master’s degree programs or continuing education programs for professionals like lawyers and architects, that do not directly address retraining for laid off workers or improving the skill-sets of low-skilled workers. Still, the government has built up an extensive and well-funded adult vocational training infrastructure, and there are an extensive array of grants and other financial aid packages to encourage participation in these programs.

Many adult education programs are coordinated with the private sector – vocational schools offer both certificates in specific fields and ongoing instruction that often involves work-study programs where the student apprentices at a private firm concurrently with his studies. Some programs lead to polytechnic degrees that are prerequisites for gaining professional licenses in certain fields. Adult students that actually complete degree programs are of course more likely to reenter the labor force than those that merely take courses – only 7% of those who completed a bachelor’s level polytechnic degree in 2002 remain unemployed.
The emergence of Finland in the 1990’s as an international ICT powerhouse comes as a bit of a surprise, as the country did not have much of an industrial base in ICT or a tradition of leadership in telecommunications. However, unlike most other western countries, the country also did not have a legacy of an incumbent telecom operator with monopoly powers or a dominant telecom manufacturer. In fact, it had literally hundreds of telecom service providers and depended largely on foreign firms for its telecom equipment. This legacy dates from 1886, when the Finnish Senate passed a ‘Telephony Decree’ that aimed to keep control of this emerging new technology out of the hands of the Russian government. At the time, Finland was struggling to assert its identity and autonomy within the Russian empire, and it did not want to allow the Russians to control a monopoly telecom provider as it did with the telegraph. The Telephony Decree resulted in the distribution of hundreds of licenses to provide telecom services within Finland and established the basis for a strong, competitive telecommunications industry one hundred years later.

Finland did have state owned telecoms firm – the Finnish Post, Telegraph and Telephone Company (the forerunner of Sonera, which later merged with the Swedish national phone company Telia). But FPTT was not a monopoly operator – it ran the national trunk network but did not control local networks, which saw stiff competition between the numerous service providers. Without any national champion to protect, Finland developed many small, efficient telecom companies eager to adopt foreign technologies and provide internationally competitive products and services. Today, there are still over 40 independent telecom service providers in Finland, but the manufacturing sector has become more concentrated around Nokia and its subcontractors.

Nokia itself has its roots in a Finnish conglomerate that was founded in 1865 as a forestry company. By the 1980’s, its ICT related business operations included an electric cable producer, a radio and television manufacturer and a wireless radio laboratory that mainly worked as a supplier to the Finnish military. These
military links would prove instrumental in forming the basis of the technologies that are used in mobile phones today. Early tenders and requests for proposals by the Finnish military for mobile communications devices eventually resulted in the country’s first mobile telephone network in 1971. While the network proved to be a bit ahead of its time, it did lay the groundwork for future developments and demonstrated the potential for commercial development of the technology.

Indeed, the most significant outgrowth of this effort was the establishment of the Nordic Mobile Telephone Technical Standard in the late 1970’s. This standard was the forerunner of today’s global GSM standard and created the largest mobile phone market in the world within a few short years. The adoption of the analog NMT standard was important because it enabled companies to compete over providing new and better products and services as opposed to attempting to develop proprietary technical standards. As the mobile phone market grew in size, companies found it easier to recoup their development costs and develop economies of scale.

Still, at this early date, the subsequent success of the Finnish ICT sector was hardly guaranteed. Nokia actually teetered on the edge of bankruptcy in the early 1990’s – dragged down by its sprawling conglomeration of business lines and the impact of the Finnish recession. Nokia was saved by a new forward-thinking management team led by Jorma Ollila that jettisoned the firm’s forestry and other business lines to focus on telecommunications. Ollila managed to recruit many of the best and brightest in Finnish business to join Nokia, and they brought with them expertise in marketing, manufacturing, supply-chain management, engineering, R&D, and other areas that allowed Nokia to draw on the ‘best-practices’ lessons from a range of different industries and firms.

Nokia made several strategic decisions that proved very important to its subsequent success. First, despite the relatively high costs and small size of the mobile phone market in the early 90’s, Nokia realized that its market would not be limited to executives or specialized businesses but rather would become a mass market consumer item. Second, unlike most new technologies, the key markets for mobile phones would not be found in the rich, developed countries of Western Europe and North America, but would instead be in emerging markets. Not only would mobile phones become cheap enough for emerging market consumers to afford, but the lack of existing telecommunications infrastructure in these countries meant there was a huge pent up demand.

This global, mass-market outlook meant that Nokia was well ahead of the game in ensuring its operations had true international depth and reach. The firm’s first manufacturing facility in China opened in 1994 and that same year it had captured 35% of global market share in mobile phones. Additionally, Nokia realized that it would have to compete in two business areas – designing and manufacturing mobile phones was not enough, it also had to compete in the market for the routers, switches and underlying infrastructure that allowed the mobile phones to operate.

The adoption of GSM by the EU in 1988 was a key step that allowed this strategy to work for Nokia. GSM was a vast step up from the old analog NMT standards because it was digital. But like the NMT, GSM was an open technical standard that promoted intense competition over price and service, rather than battling each other over rival closed, proprietary standards. Nokia could thus quickly build economies of scale based on the GSM standard throughout the world, relying on its previous experience and R&D work. As mobile phones, and Nokia with them, took off internationally, the ICT sector’s significance to the Finnish economy expanded exponentially. As the following chart shows, by 1998 electronics and electrical equipment were the largest Finnish manufacturing industry by revenues.
At the same time as Nokia was conquering global mobile phone markets, Finland’s domestic ICT infrastructure was expanding apace. Mobile phone penetration rates in Finland grew very quickly, and today there are more mobile phone subscriptions than people in Finland.

The internet also gained early adoption in Finland. Sitra funded the creation of the first data network in Finland, which linked the main universities together in 1971, well before modern communications protocols like TCP/IP had been invented. The first commercial internet service provider was launched in Finland in 1993, and Finnish software writers and coders were important participants in the development of many
internet technologies like Internet Relay Chat (IRC), and even more significantly, the open source model for software. Linus Torvalds, the creator of the Linux operating system, was one of the first people to utilize an open-source model while he was a student at Helsinki University in 1991. He did so by posting the code to his new operating system on a Finnish server along with the request that other coders join him in helping develop the software. In the years since, Linux has had tens of thousands of programmers work on its code, and has emerged as an increasingly viable alternative to Microsoft Windows or the Apple OS.

### Using High-Tech to Boost Traditional Industries

Despite the headline grabbing emergence of Nokia and the ITC sector as engines of Finnish growth over the last two decades, a large proportion of Finnish jobs and economic production remain in ‘traditional’ industries – especially the forestry, shipbuilding, chemicals and energy sectors. These sectors have faced intense challenges from international competitors – often developing countries with much lower labor costs and tax regimes. And yet Finland has managed to leverage technology and sustained productivity increases to keep these industries internationally competitive and exploit new niches where midsize Finnish firms can dominate the global marketplace.

Take, for example, the links that Finland has built between the forestry and energy sectors. Paper and saw mills are very energy intensive, but are often located in remote rural areas away from the national power grid. Mills also produce a lot of scrap and waste materials – like the sawdust and bits of wood left over after the mill saws trees into boards and planks. But by using this waste as bio-fuel to power on-site electricity generating capacity, Finland has managed to solve both of these problems in one fell swoop. &0% of the energy used by the forestry sector now comes from wood-based fuels. It has also gained a first-mover advantage in an industry set for explosive growth as high oil and gas prices make other sources of energy more competitive and as worries over global warming are prompting a wave of new investments and tax incentives into renewable energy production.

The forestry sector used to dominate the Finnish economy, and by some estimates, still accounts for nearly 30% of GDP when all the service providers, sub-contractors and manufacturers of forestry and paper machinery are taken into account. Unfortunately, the seminal importance of the forestry sector led Finland indulge in many economic policies throughout the 1950’s, 60’s, 70’s and 80’s that, while benefiting the forestry sector, ultimately harmed other aspects of the Finnish economy. Periodic currency devaluations, state subsidies, and import substitution policies protected the sector from international competition, but became increasingly out of step with the interests of the rest of the Finnish business community. By the time the recession of the early 1990’s hit, the country knew it could not go on coddling the forestry sector and that it must be left to its own devices in the international marketplace.

But the real story here has proved to be Finland’s ability promote productivity growth in its forestry sectors and adapt to a more competitive global environment. Technology and education have played leading roles here: Fully two-thirds of all the forestry engineers in Europe graduated from Finnish universities; special degree programs exist for nearly every type of forestry related career in Finland, these programs include certificates that can be earned in vocational schools through Bachelors degrees in colleges to PhD programs in Finnish universities. And as in other areas of the Finnish economy, R&D work takes place in private companies, in academia, in government ministries, and in special research institutes that promote collaboration between the three groups.

One notable example of Finland’s ability to transform the traditional forestry industry into a center of innovation involves a company called Ahlstrom. Founded in 1851, it grew into a forestry conglomerate with
fingers in everything from wood products to pulp and paper. In the 1970’s, the company was trying to improve productivity at its paper mills and started experimenting with computerized control and automation systems at its plants. These efforts were centered on the town of Varkaus in rural Finland, where the company established an R&D center and a small production unit, and soon proved to be very successful in increasing efficiency at the mills. So much so, in fact, that Ahlstrom began selling the system to competitors and exporting it internationally. In the early 1990’s, however, as the Finnish forestry industry entered a downturn, Ahlstrom decided shed some of its business lines and refocus on its core competencies. The computerized control and automation business was sold off to Honeywell, an American multi-national. But instead if simply taking the technology and integrating it into its own products, Honeywell found that the specialized knowledge that had been built up in the town of Varkaus was of such a high quality that it made the town the center of its global R&D facilities in the field of computerized control and automation for paper mills.

An important aspect of the Finnish forestry industry is that much of its employment and wealth creation is concentrated in rural areas. While the 1980’s saw a substantial decline in employment in the forestry industry, the restructuring helped the industry to survive and remain globally competitive. Forestry plays an important role in ensuring that economic development in Finland is geographically diversified, and because of land reforms carried out by the Finnish state in the first half of the 20th century, private landholdings of forests is high in Finland. Most Finnish farms have extensive holdings of forests, and farmers and other private owners supplement their incomes by providing the bulk of the timber supplied to the pulp, paper and sawmill industries. Less than 30% of Finnish forests are government owned, the rest are controlled either by farmers, individuals, or private companies.

Maritime Sector

One of Finland’s most important traditional industries is shipbuilding. Although the very first shipyards were built in Finland in the 1700’s, a modern shipbuilding industry did not appear until the 20th century. The Russian Imperial navy commissioned ships from Finnish shipyards in the early part of the century and then, in the 1930’s, Finnish shipyards were involved in the construction of German U-boats, as the Versailles Treaty had banned Germany from building such vessels. The design and financing of the submarines of course hailed from Germany.

This sector underwent a major expansion after World War II as part of the effort to pay off Soviet war reparations. Due to the tensions of the Cold War, it was necessary for the Finns to develop an integrated shipbuilding industry, with all of the subcontracting and outfitting done by Finnish firms, in order to avoid restrictions on the export of sensitive maritime goods from the west to the Soviet Union. As a result, the Finnish shipbuilding industry today might better be characterized as a ‘maritime cluster’ than just a number of old-fashioned shipyards. In addition to shipbuilding and repair, the companies in this cluster make engines and propulsion systems, electronic devices, storage containers, cranes, and operate ports and shipping lines. The Finnish maritime sector is broad and deep in the sense that almost every major component that goes into making a modern cruise vessel or passenger ferry can be made domestically, often by small or medium sized companies that specialize in particular niches.

In the 1980’s and 90’s, the Finnish maritime industry underwent a period of crisis and consolidation. While several older shipyards were closed and many workers were laid off, the industry was successfully restructured. The major Finnish shipyards are now part of an international portfolio controlled by Aker Yards, a Norwegian based shipbuilding company. The Finnish yards specialize in cruise ships, passenger ferries, icebreakers, naval ships (they are the main supplier to the Finnish navy) and maritime support vessels.
and carry out work in all phases of production from design to engineering to construction to outfitting. But these yards depend on a network of suppliers that extends throughout Finland. There are over 2,500 companies in the maritime cluster which employ roughly 47,000 people. These people are increasingly skilled engineers, designers and professionals as opposed to the welders and manual laborers of yore. Increasingly, the construction of hulls and other types of low-value added construction are being transferred to shipyards in Eastern Europe or Asia, necessitating a move up the value chain by Finnish companies. Luckily, the design, construction, outfitting and operations of post-panamax vessels like the biggest new cruise ships has become much more complex, requiring the kind of expertise and human capital that Finland has been developing. Tekes has been an important source of support in this effort to move up the value chain. As the following chart shows, the metals and machinery sector has been either the first or second most funded industrial sector by Tekes for the past decade.

The sector is also one of Finland’s major exporters. The country has commanded an average of one-fifth of the world’s total market for passenger ships in recent years, making cruise ships scheduled to ply the Caribbean, and car and passenger ferries that work the Baltic and North Seas. In 2001, the maritime sector made over €4 billion worth of exports. In addition, over 80% of Finland’s exports are ship-borne, so the ports play an important part of the story of the international competitiveness of the country’s forestry, oil and chemicals sectors.

**Energy**

With its remote location, harsh winters and lack of domestic energy resources like oil and coal, Finland has been forced to use technology and innovation to help meet its demand for energy and ensure the safety and security of its population. Thanks to sustained efforts in these areas, the Finnish economy now stands to benefit (instead of suffer) from rising prices and competition over diminishing energy resources in the rest of the world. Finland is the global leader in bio-mass electricity production, a major producer of electricity from nuclear power, and even an exporter of oil products thanks to sophisticated refineries that specialize in turning high-sulfur oil from Russia into gasoline, plastics and other products.

One of the most unique features of Finnish energy production is its reliance on district heating in its urban centers. District heating is a very efficient way of utilizing energy – a modern natural gas-fired power plant, for example, can recover up to 92% of the total energy content of the gas by producing both heat and electricity. The way it works begins with a gas fired co-generating facility located in or near a city or particular neighborhood. When the plant burns natural gas to produce electricity, it also produces a prodigious amount of heat. This heat is captured using a series of steam and water pipes that are in turn connected to every house and building in the vicinity. So instead of having individual (and hence inefficient) furnaces in each building to produce heat, entire neighborhoods can rely on an individual generating plant for all their heating and electricity needs. Further efficiency gains are made through strict regulations that mandate the use of insulation special building techniques in all structures.

Finland is also a major producer of nuclear power. Outside of France, Finland is the only European country currently building new nuclear generating capacity. Finnish nuclear plants utilize Swedish and Russian reactor designs and tend to be located away from the major urban areas. For safety reasons, they cannot used for district heating and are used only for generating baseload capacity.

Approximately 25% of all Finnish energy production (including heat and transportation) is nuclear. Oil accounts for another 25%, natural gas 15%, hydro 10% and bio-mass 20%. Total oil use has actually gone down since 1980, when the oil shocks of the 1970's inspired Finland to develop alternative sources of
energy. Most Finnish oil and gas is imported from Russia, which maintains two pipelines that run into Finland.

Finland deregulated its electricity markets in the 1990’s, a reform that has a mixed record of success. Prior to the liberalization, Finland has several electricity generating companies that were owned either by the state or local municipalities. The generating companies were privatized, but the national grid operator – which maintains the transmission lines – was kept heavily regulated. It is owned by a consortium of the state, the private power companies, and pension funds. The liberalization was complicated by Finland’s reliance on district heating and the challenge of integrating local transmission wires with the national grid. District heating depends on having a monopoly supplier, and so today the privatized descendents of the municipal power companies maintain their monopoly on district heating but sell electricity into a competitive market. In other words, if you are a homeowner in Helsinki, you must purchase your heat from Helsinki Energy Works, but you can buy electricity from any one of several competing electricity generators.

Unfortunately, despite various studies that predicted liberalization would lead to lower electricity prices, this has not occurred. Previously, Finnish regulators had mandated that all electricity generators maintain an extra 10-15% of extra generating capacity to ensure the safety and reliability of the overall system. After the liberalization, the newly deregulated generating capacities had a fiscal responsibility to their shareholders to increase the efficiency of their operations, so all this extra capacity instantly came onto the market, and prices did initially come down. But the economy was growing quickly – recovering from the recession in the early part of the decade, thus spurring demand. So this extra capacity soon disappeared – which suited the newly privatized companies, as their margins and share prices (not to mention their managers’ compensation packages) all increased – and nobody wanted to step up and take responsibility for building and maintaining the extra capacity necessary to ensure the safe and efficient operation of the system.

So the net result of electricity liberalization has been that retail and wholesale prices have gone up and the regulators and generating companies have not managed to come to an agreement over how extra capacity should be built into the system and who should pay for it. Still, it is too soon to give a final verdict on the results of this experiment – building new generating capacity is both capital and time intensive, and the complexities of operating real time electricity markets are daunting and will perhaps improve as the various players gain more experience (and Finland has avoided any Enron style meltdown thus far). In addition, Finland’s efforts are part of Nordic-wide effort to deregulate and create one big pan-Nordic power market. Once more interconnections are built between Finland and the other Nordic countries, a more efficient market could result.

Lessons for Israel

Finland has an extremely well organized public infrastructure for promoting R&D and innovation generally. From the Science and Technology Council through to Tekes, Sitra and the education system, Finnish policy makers are able to set goals, make detailed plans, and implement them with impressive speed and efficiency thanks to the strength of these institutions. These institutions are inclusive and consensus driven in that they include participants from the highest levels of business, academia, labor and government, and are thus able to get all of these sectors to ‘buy in’ to the development goals and work cooperatively to achieve the desired results. Further, Finland has effectively integrated high-tech into the lower tech sectors, such as the lumber and paper industries. This is one area in which Israel can certainly look to Finland’s example. Bringing low-tech and service industry up to a level of global competitiveness requires encouraging the high tech sector’s spillover effects into other areas of the economy.
Finland has proven particularly successful at promoting strong links between universities and the private sector, building a science and technology focused educational system that is good at preparing students for private sector jobs and takes into account industry’s long term needs for skilled engineers, technicians and business managers.

In short, Finland is an excellent example of what a 21st century industrial policy looks like. A forward thinking industrial policy is not about protecting existing industries or having the state manage the economy. Rather, it is about promoting new technologies and innovations that have the power to create brand new industries or help existing ones move up the value chain by transforming themselves into more advanced, more competitive businesses. It does so by investing in human capital and encouraging cooperation between business, academia, labor and the public sector. As the growth in Finnish GDP per capita shows, these policies have worked.
Background

In its edition of January 1988, The Economist titled its survey of Ireland “Poorest of the Rich” and led the story with a picture of a child with her young mother begging in the streets. The survey emphasized that Ireland was the poorest country in north-west Europe with a GDP of only 64 percent of the European Community average.

Nearly ten years later, the cover story of The Economist was “Europe’s Shining Light.” It noted that Ireland had caught up to the European average GDP and was getting steadily richer. If The Economist were to do another story on Ireland today, it would have to report that the emerald island is now the second richest country in Europe with a GDP that is 30 percent over the European Union Average.
Ireland achieved independence from the U.K. in 1922 but maintained an open Anglo-Irish economic relationship for the next decade. In 1932, under the strain of global economic depression, Ireland instituted a series of protectionist measures particularly aimed at their major trading partner, the UK. Foreign ownership of Irish companies was banned and high tariff walls were raised as the government attempted to foster indigenous infant industries. At the same time, Irish capital and labor was free to move abroad. These policies were maintained until the mid-1950s.

With foreign capital banned from the manufacturing sector and Irish banks able to freely invest abroad, where returns were higher, little domestic investment or economic development took place during this time period. Ireland missed the post-war European boom. The Irish economy consisted mainly of relying mainly on small-scale agriculture that exported primary produce to the U.K. as well as small manufacturers producing for the tiny home market of less than 3 million people. During this time period, most of Western Europe and Japan were achieving growth rates of around 6%, while Ireland maintained a mere 2%.

Importing sophisticated consumer goods and capital left Ireland with a serious balance of payments crisis and overall macroeconomic instability. The economy stagnated, and net annual emigration reached 40,000 persons during the 1950s. In a single decade, the country lost 400,000 people – one seventh of the entire population.

By the end of the decade, the government accepted that changes were desperately needed and set about revising policy. The laws banning foreign investment in Irish manufacturers were abolished and the Irish Development Authority (IDA), which had been established in 1949, was now encouraged to aggressively recruit foreign investors using tax incentives and other financial inducements. In 1958, the First Programme for Economic Expansion was introduced and set Ireland on a new course of trade liberalization and structural reform with the full backing of most political leaders. Tariffs were unilaterally lowered and a free trade agreement was concluded with the U.K. in 1966 which reestablished ties to Ireland’s leading trade partner. These moves towards a more open economy were followed by the introduction of a zero tax rate on profits from manufactured exports. As most of the country’s exports at that point were agricultural in nature, Ireland was able to effectively create a very manufacturing-friendly environment without taking significant revenue cuts in the short term. Further, the National Industrial and Economic Council was created as a forum in which representatives of government, business, labor, and other interests could discuss and plan together how to meet the challenges of liberalization and openness.
While this trade liberalization was taking place, important domestically oriented measures were also introduced. In 1965, the OECD conducted a survey of Ireland’s national education system. The official report was a scathing assessment—the survey found that over half of Irish children left school at or before age 13. In response, education policies and funding were reformed to provide free primary and secondary education and greatly to increase the resources expended on education at all levels.

These fiscal and policy decisions led up to Ireland’s participation in a number of international economic agreements. In 1967, the country joined the General Agreement on Tariffs and Trade (GATT and the predecessor to today’s World Trade Organization – WTO) and in 1973 it became a member of the European Economic Community. Then in 1978, it broke its long link with the British pound sterling and joined the European Monetary System, the precursor to the later European Monetary Union (EMU) and the Euro.

The result of all this was much increased investment and improved economic performance as average economic growth hit 4.2 percent throughout the 1960s. This was further enhanced in 1970 when the IDA was separated from the Ministry of Industry and established with its own board, staff, and operating freedom as a kind of state backed venture capital or private equity fund. It adopted pragmatic, business-like marketing methods for inducing foreign MNCs to invest in Ireland. The key decision was to focus on companies that represented the future – high technology, high output, and high skills. These included companies in the computer, pharmaceutical, medical technology, and international services industries. Some early investors included Amdahl, Baxter Travenol, Merck, and Warner Lambert. By 1975 more than 450 such companies accounted for two-thirds of Ireland’s total industrial output.

Despite this encouraging performance, the new growth resulted in only small gains in employment. Some jobs were lost as formerly protected (mostly agricultural) sectors of the economy could not compete in the newly open market and laid off workers. At the same time, the share of the state in the economy increased from 32 percent in 1960 to 42 percent in 1973. This was partly due to increased spending on education and infrastructure but also to more generous welfare programs and to an increase in public sector employment which amounted to about a third of total employment. Entrance into the EU in 1973 was also a mixed blessing. While it opened new markets and stimulated investment, it also put Irish agriculture and industry under increased pressure that resulted in long term gains but immediate pains and costs of adjustment. On top of this came the oil crises of the 1970s that further raised costs and taxed the economy.

Throughout Ireland’s ascension to the EU, Irish unions (representing 55% of the workforce) strongly opposed the move, citing potential job loss in the face of strong competition—a prediction that did come to fruition. The relationship between the state and the unions, always an adversarial one, intensified during this period. On one hand union demands for wage increases unrelated to productivity growth were deemed unreasonable. On the other hand, the Irish government was lax in effectively combating the effects of strong competition on Ireland’s native industries.

From 1971-1980, inflation averaged 13.6 percent while unemployment rose stubbornly to an average of 9 percent despite a myriad of government programs to reduce it. The government’s reaction was to redouble spending while cutting taxes in an effort to use government deficits to stimulate more growth. But the spending meant a dramatic increase of domestic and foreign debt while it also exacerbated inflation and the balance of payments deficit. Needless to say, this was not an attractive investment environment for foreign MNCs and some actually pulled out while others resisted the enticements of the IDA. At the same time, the government was heavily subsidizing the public service enterprises and the state owned companies in the steel, fertilizer, gas distribution, and airline industries, among others. By 1987, unemployment was 16 percent, the rate of inflation was around 20 percent, government debt stood at 125 percent of GDP, the balance of payments deficit was around 14 percent, government spending grew to 64 percent of GDP, and
one percent of the population was leaving the country each year. This was even worse than the crisis of the 1950s that had led to the reform strategy.

Indeed, there was a real fear that both foreign and domestic lenders might refuse to roll over the government’s debt. In the face of this threat, the country’s leaders, and especially those of labor and industry, agreed to leave their swords at the door and came together under the National Economic and Social Council to form a new consensus and a new strategy called the Program for National Recovery. Under it, the unions agreed to keep wage increases in line with inflation and productivity gains and to substantial cuts in public spending along with privatization of many state owned enterprises in return for modest reductions in direct income taxes and commitments from business on continuing domestic investment. The Unions, government, and employers also established a system of regular joint review of the economic situation and establishment of a continuing consensus on wage and employment conditions.

In the wake of this agreement, spending was cut severely across a range of programs and many government agencies were abolished as the government moved toward achieving a balanced budget and even a surplus. Taxes on corporations doing manufacturing and defined services were set at 10 percent while personal tax rates were reduced gradually from a base rate of 35 percent to 20 percent and from a top rate of 58 percent to 42 percent. At the same time, despite the cuts in some spending, public investment in critical infrastructure, particularly telecommunications (in which Ireland became the European digital network leader), was increased as was support for IDA and for an International Financial Services Center (FSC). Renewed attention was also turned to education which received substantially increased funding as well as reforms that opened quality schooling to more students and gave a broader range of options for advanced education and lifelong learning. A network of technical colleges that popped up in the 1970s was expanded and improved to make the schools curricula more practical in orientation and responsive to needs of local industry and business.

The decision came about the realization that unlike the UK, which had a developed system to provide technicians based in its early industrial history, Ireland needed to provide this intermediate level of workers immediately. The resulting Institutes of Technology were a system above and beyond what the UK had available. By focusing on sub-degree programs of a shorter length that traditional universities, these institutions were able achieve the desired effect—Ireland’s level of available, technically skilled, English-speaking labor rose very quickly. Today, they have an exceptionally high number math and science degree graduates. Additionally, almost 40 percent of Ireland’s population was under the age of 25 compared to 30 percent or less for most other European countries. Ireland’s baby boom peaked 20 years after that of the rest of Europe. So a cohort of young and now well educated but low cost (relative to elsewhere in Europe or the U.S.) workers was coming onto the labor market at a moment when circumstances were very favorable for Ireland.

In the mid-1980s and early 1990s, Ireland began to reap the benefits of joining the European Union. As one of the poorer countries of Europe, Ireland was eligible to receive EU structural funds, agricultural payments under the Common Agriculture Policy, and substantial R&D funding under various EU development programs. At one point, nearly 4 percent of GDP was coming to Ireland in payments from the EU. As important was the discipline imposed by the EU’s Acquis Communitaire (the body of regulations and laws governing the single market) particularly in terms of responsible fiscal and monetary policies. The advent of the single market meant Irish producers had free access to the world’s biggest market. Most importantly, however, by electing to join the Euro zone, Ireland put itself in the position of being the only English speaking country in the zone in addition to being the country with the lowest corporate taxes, lowest wages for engineers and highly skilled technicians, the least pressure for unionization, the lowest health care and pension benefits, the best telecommunications infrastructure, a favorable exchange rate at the time, and the most generous investment incentives in Europe. For foreign companies, and especially for American MNCs looking for a way to get inside the EU and Euro zone that they feared might become a protectionist
“fortress Europe”, this was an offer they couldn’t refuse. Ireland’s attractiveness began to peak at a moment when the pace of globalization was accelerating and the combination of good communications and fast air transport was making it possible for the world's major markets to be served by producers almost anywhere, even in formerly poor small countries on the periphery of Europe.

The result was one of history’s great economic turnarounds. By the 1990s Ireland had created a favorable environment for growth that then benefited from their combination of language advantage, corporate-friendly tax policies, newly friendly labor relations and high level of technical human capital. As demonstrated in the charts below, a tsunami of foreign investment flooded into Ireland driving huge gains in production, exports, overall economic growth, employment, and per capita income. Between 1990-95, growth averaged 4.8 percent annually and then really took off between 1995-2000 to an annual average of 9.5 percent. Since then it has maintained an average rate of about 4.5 percent, making Ireland the second richest country in Europe after Luxemburg with a per capita GDP 30 percent higher than the EU average.
Ireland has a top-notch civil service that is reasonably well paid and maintains good social status. The top civil servants work relatively easily with top business and labor leaders and have shown unusual leadership qualities in times of crisis. They are recruited from among the top university graduates. The public sector has rallied around a strong economic and social goal. As articulated in the Annual Competitiveness Report of 2006, it is: “Economic dynamism and social progress go hand-in-hand...in a small economy like Ireland’s, a successful, innovative, technologically advanced and growing base of exporting companies is a foundation for national economic and social progress and for building a fair, inclusive, and sustainable society in which all can contribute to and benefit from rising prosperity.”

With that objective in mind, Ireland has created a National Competitiveness Council that reports to the Prime Minister. This council benchmarks the Irish economy annually against competitors and coordinates the key agencies of the government as well as of the private sector in developing the annual competitiveness plan. Forfas is the elite agency that acts as the secretariat of the council and that carries out the benchmarking activities and establishes the major planning guidelines. Its three divisions are: the Competitiveness Division, the Enterprise Policy and Corporate Services Division, and the Science Technology and Innovation Policy and Awareness Division. It also provides research and administrative support to and coordinates a number of independent advisory councils including: the Science Council, the Expert Group on Future Skills Needs, and the National Economic and Social Council. Then, there is the IDA which, of course, is well known as one of the world’s foremost investment and development agencies. In addition, Enterprise Ireland is responsible for fostering indigenous companies and particularly for stimulating new ventures, start-ups, and venture capital activity. Also within the office of the Prime Minister is an official whose task is to oversee the development of infrastructure including roads, ports, airports, water works, telecommunications, and energy suppliers and distributors. All of these and others meet frequently with each other, with leaders in business, labor, the media, and academia to discuss and coordinate. So there is a rich and continuing exchange of information at all levels.
Ireland’s policymakers realize the necessity of adapting to a global economy in order to maintain this spectacular growth pattern. There is pressure, particularly from the export-led economies of East Asia, to maintain low production costs and keep at the forefront of infrastructure and technology. Further, these additional pressures will force Ireland to exploit their natural advantages to an even greater extent. To respond to these challenges, a new National Development Plan has been adopted for 2007 to 2013. Entitled *Transforming Ireland – a Better Quality of Life for All*, it sets out the roadmap to a radically new future in which Ireland moves toward more high value-added economic industries and activities. There are six major goals, each of which has been given a substantial budget to achieve its goals:

- **Build an infrastructure that is world class in every respect.** ($70 billion)
- **Greatly enhance enterprise development, new start-ups, science, technology, and innovation.** ($26 billion)
- **Make Ireland world class in education and upgrade working age training and skill provision.** ($30 billion)
- **Integrate regional development within the National Spatial Strategy framework of Gateway cities and Hub towns to provide for major investment in the rural economy and to stimulate regional growth.** ($35 billion)
- **Invest in long term environmental sustainability.** ($30 billion)
- **Deliver a multi-faceted program for Social inclusion.** ($65 billion)

In total then, Ireland is committing over $200 billion over the next six years to equip itself to meet the competitive challenges of the 21st century. This might be considered its Competitiveness Budget. The plan emphasizes that all this spending must be accommodated under budgetary rules that have kept Ireland in a surplus position for nine of the past ten years. It notes that this also must take into account the annual transfer of 1 percent of GDP to the National Pensions Reserve. A key point is that there is now a unique window of opportunity. In the longer term, pressures will build on the public finances in the areas of health care and pensions, so now is the time to invest in long term competitiveness.

**Labor**

Ireland’s Social Partnership Agreements have been integral to the country’s successful transition to leading economy. Since the first one in 1987, there have been five additional national pay agreements between employees, employers, and the government. These are achieved through extensive continuing analysis by and discussion between the Irish Congress of Trade Unions, the employers association, and the government. They are undertakings to set wage levels and working conditions in accord with agreed estimates of productivity and inflation. They have been indispensable in moderating inflation, dramatically reducing time lost to industrial disputes, and maintaining labor competitiveness. They have also been essential in enabling the government to introduce and maintain fiscal discipline. Without these continuing agreements, little else would be possible. In addition, or perhaps because of these measures, Ireland’s total tax wedge is a very low 16 percent putting it in a class with Singapore and Taiwan in this regard. Moreover, the cost of work force reduction where necessary is also not excessive.
Macroeconomy

From a budget deficit of 9 percent of GDP in 1987, the balance was brought into surplus in 1997 and any deficits since that time have been kept below 1 percent of GDP. The debt to GDP ratio has been reduced from 120 percent to 28 percent, the second lowest in the EU and one of the lowest in the world. This has been achieved by an initial round of dramatic spending cuts followed by a combination of continuing discipline and the fruits of growth that have led to burgeoning tax receipts even as many taxes were reduced. In addition, the reduction of government debt has greatly reduced debt carrying charges. Of particular significance today is the funding of the National Pensions Reserve Fund which gets the equivalent of 1 percent of GDP annually to prepare for the future burden of an aging society. Given Ireland's relatively youthful demographic profile, the fund will put it in a very strong future position.

At about 30% of GDP, total government spending is relatively small compared to most European countries although large compared to Singapore or Taiwan. The same is true of the tax burden which at 30% of GDP is also relatively small.

Monetary policy is, of course, in the hands of the European Central Bank (ECB) for euro zone members like Ireland. Ireland has benefitted from this until now in two ways. First, the ECB has been steadfast in keeping inflation under control, but secondly, the weakness of the euro in its early years greatly improved the competitiveness of Irish exports compared to those of its near rival the U.K.

Ireland has maintained a national savings rate of 22-26 percent over the past fifteen years while, of course, also attracting a large amount of foreign savings. Investment has been very healthy at 25-30 percent of GDP. This is not Singapore, but it is very competitive.

Business Environment

Both personal and corporate tax rates were reduced as an incentive to investment and to the immigration of skilled people. While corporate tax rates were initially set at 50 percent, the IDA provided long tax holidays and rates of 10 percent for exports and for defined industry segments. This was eventually transitioned to a 12.5 percent general corporate rate. Personal rates were reduced from the 60 percent maximum range to a current maximum of 40 percent with a standard rate of about 20 percent. These low tax rates and investment incentives were absolutely key to attracting the foreign MNCs that have driven so much of the Irish investment and growth.

Ireland’s Forfas constantly benchmarks and analyzes the trends of the economy. The most recent benchmark results are attached as an appendix to this chapter. A glance at them clearly reveals that Ireland’s success and recent world developments have created new circumstances that pose serious new challenges. What worked in the past may not be enough to ensure continuing success in the future.

The dramatic rise in Irish per capita GDP has, of course, been very welcome, but it means that Irish labor costs are no longer a super bargain. Economic success has also raised the price of real estate and other costs. In addition, whereas the weakness of the euro in its early years was a competitive boon for Ireland, the recently strengthening euro is dramatically raising Irish costs and prices. There is also a lot of new competition for foreign direct investment from China, India, and elsewhere. All of this means that Ireland is no longer a haven for low cost manufacturing by foreign MNCs. Indeed, the manufacturing sector is in
decline and some factories are moving to China and elsewhere. From 2001-2006, Ireland lost 32,000 manufacturing jobs. Thus, the strategy of enticing foreign manufacturers to Ireland is no longer working as well as it once did.

In the face of declining export competitiveness after 2000, a second phase of Irish growth ensued that was driven mostly by rising domestic consumption and especially by construction which has enjoyed a huge property boom and now employs 13 percent of the work force compared to only 11 percent for manufacturing. This phase has also resulted in a large current account deficit as the Irish spend more than they earn and finance the excess consumption by borrowing abroad and running down their international assets.

This pattern of development has become a cause of concern for many Irish leaders. High levels of construction do little to stimulate productivity growth or innovation and technological advance. With construction at twice the share of GDP as most other countries and accounting for over a third of total growth, the economy is overly dependent on this single sector. This also increases exposure to the risks of global housing price volatility, high levels of household debt, interest rate volatility, and a strengthening euro. Even without an external “shock”, the pattern of spending beyond earnings and building up foreign liabilities is inevitably unsustainable and could eventually leave the Irish economy with an inflated cost base and a depleted stock of companies, know-how, and technology with which to compete in international markets.

Beyond the issues of excess consumption and construction, there are other problems. Much of Ireland’s infrastructure is still deficient by the standards of other advanced economies. Utility costs remain relatively high as a result of lack of competition. New start-up companies and venture capital activities are relatively few and too few of them develop into medium and large scale companies. The use of ICT and the uptake of broadband are still lagging. Despite great emphasis and expenditure on education, there is still a 20 percent drop-out rate by the end of secondary school. Science and math literacy is only average while the number of
PhD’s in science and engineering is low and participation in lifelong learning even lower. R&D spending is well below other leading countries and business support of R&D is particularly low. Finally, productivity growth has slowed to only about 1.4 percent which is not enough to sustain the wage increases of recent years without further loss of cost competitiveness.

Along with streamlining their business environment and making it friendlier to foreign companies, Ireland is also focused on creating an economy based largely around the high-tech sector, seeing that as the future of global competitiveness. Combining their favorable tax policies with investments in technical education and high quality telecom infrastructure has paid off. The high tech sector’s share of the Irish economy is growing rapidly, as demonstrated below. This trend is critical to maintain in the minds of Ireland’s policymakers. Staying on the cutting edge of technological production and services can help the country maintain its now high standard of living and stay in the running with countries like China, South Korea and Singapore, all of which are imminent threats in the export market and have focused their development strategies around the high tech sector.
Infrastructure

Infrastructure had suffered from decades of under-investment before the 1990s and was therefore given the highest priority as part of the development plans. Thus capital investment in infrastructure was raised to nearly 5 percent of GDP for improving Ireland’s shipping, travel, and communications links as well as its domestic transport and energy and water supply.

A very large budget is being appropriated to enhance critical infrastructure. Over half of it is to upgrade roads and domestic transportation links. But ports and airports are also to receive substantial investment for upgrades. There is also about $1 billion to be allocated to ensuring that every home and office has broadband internet connections. A key element of this will be an increase from 27 to 90 Metropolitan Area Networks (MANs) that are State owned and operated on an open access basis thus reducing costs by removing the need for service providers to install their own network. At the same time, an attack is to be made on high utility costs by increasing competition in the electric and telecommunications markets.

As part of Ireland’s long range plan, a National Spatial Network has been created that more closely links smaller villages and towns with Hub cities. This integration should have several effects. The first and foremost is that travel will become much quicker and easier, allowing residents of these outlying areas to take better advantage of the job and educational opportunities of the larger cities. Secondly, existing businesses in rural Ireland will have a reliable transport network at their disposal, increasing their access to urban and international markets. Finally, quality infrastructure in these outlying areas, which boast even cheaper labor markets, can encourage the start up of new industries without fear of being cut off from the domestic and international markets by locating in a rural area.

Education and Innovation

Ireland’s emphasis on education has certainly paid off. Public expenditure on education tripled from 1985 to 2005 with the result that the percentage of students going for tertiary education rose from 11 percent in 1965 to 57 percent in 2003, and the number of 25-34 year olds who have attained tertiary education now stands at 37 percent. In particular, Ireland produced a high number of science and engineering graduates with over twice as many in this category as the EU average. For example, in 2004, Ireland produced 48,000 graduates of whom 57 percent had degrees in engineering, computer software, business studies, or science.

Continuing this trend is actually the heart of Ireland’s future plan. It is based on the conclusion that the factors contributing to Ireland’s economic success in the past will not do so in the future and that new competitive pressures will require fundamental strategic change. In particular, the Strategy for Science, Technology, and Innovation will focus on a vision of Ireland as internationally renowned for its excellence in research and for being at the forefront in generating and using new knowledge for economic and social progress within an innovation driven culture. Accordingly the plan provides for development of a world-class research system, the doubling of PhD graduates, and the attraction of top overseas researchers to work in Ireland. It also contains measures to ensure that research is turned into commercial value and it is oriented toward encouraging firms to become more engaged in R&D activity.
About $5 billion is being allocated to the World Class Research Sub-Program. Central to this will be the work of the Science Foundation Ireland. It will use grants to outstanding researchers in biotechnology, information, and communications technologies to create a dynamic research community in Ireland. It will also establish Centers for Science, Engineering, and Technology where researchers will build collaborative programs linked to international industry.

The three main Irish research councils will support post graduate students while special funding will be made available to the universities and technical colleges and institutes to increase the flow of students into postgraduate programs.

A major objective of the plan is to get firms more involved in doing R&D. One element in this effort will be a scheme to provide financial supports to companies that undertake research. There will also be Knowledge Acquisition Grants for small companies that engage in in-house research, and Enterprise Ireland will also provide support to SMEs that engage in R&D. Enterprise Ireland will also provide support for and encourage collaboration between higher education institutions and industry on research. At the same time a National Digital Research Center will be established to focus on collaborative research in the area of digital media. To assure that publicly funded research will be commercialized, Enterprise Ireland will operate a Commercialization Fund to support academics taking research forward to commercialization. It will also operate an Intellectual Property Fund to assist both technical institutes and firms with the protection and management of patents arising from research. It will also support construction of campus-based Business Incubation Centers in all Institutes of Technology and Universities. Finally, Enterprise Ireland will also support each Institute and University in developing its own Technology Transfer Office.

The plan provides for important support to a number of areas such as energy, agricultural, marine, and environmental research. But of particular interest is the Tourism Program for which $500 million is being allocated. At first glance, it seems strange that plan mostly dedicated to enhancing technology should also support tourism. But the logic is that everyone cannot be a PhD researcher. As manufacturing jobs leave Ireland, it will be necessary to create jobs for those with modest skills who formerly manned the factory production lines. Tourism is an industry that cannot be outsourced and that is labor intensive. So the concept of this plan is to use the new technology and more investment in infrastructure to develop the tourism industry as a partial substitute for manufacturing. The target is to double tourism revenue to about $8 billion by 2012 and to increase visitors from 6 to 10 million. Doing this will involve 70 specific action plans to upgrade facilities, enhance worker skills, install new technology, and so forth. A similar plan is also being put in place for the closely linked Marine industries.
Development and improvement of human capital is the second main pillar of the plan with a budget of about $30 billion. The objectives are to up-skill and expand (by including more women and older people) the workforce, to modernize and expand the education infrastructure, to use the Strategic Innovation Fund to reform the programs of tertiary educational institutions to align them more closely with national development priorities, to increase the number of high quality graduates and especially to double the number of PhD graduates, and to increase the number of schools and teachers to accommodate the growing population.

The first major element of this part of the plan is a $10 billion effort to provide retraining to workers and to establish effective lifelong learning programs while also integrating large numbers of immigrants smoothly into the workforce. This National Skills Strategy is based on a report of the Expert Group on Future Skills Needs. It articulates a vision in which 48 percent of the workforce would have qualifications at NFQ (National Framework for Qualifications) levels 6-10 while 45 percent would be at levels 4-5.

The second key element is modernization of the schools in terms both of infrastructure and program. About $8 billion will be spent to upgrade facilities and expand the number of classrooms while also carrying out a thorough curriculum reform that will focus on strengthening language learning, increasing the physical science content of the core curriculum, and reforming approaches to post-primary mathematics teaching. An additional important feature of this aspect of the plan is a $350 million project to develop the infrastructure and curriculum for more effective e-learning activity.

The third major element is a $17 billion program for improvement of Higher Education. It is estimated that 62 percent of net new jobs to be created in 2010 will require third level education as opposed to only 30 percent in 2001. This investment is aimed at transforming Ireland from a technology importing, low cost economy to an innovation based, technology generating economy with research and innovative indigenous enterprises becoming the new drivers of growth and competitiveness.

Society

As a society, Ireland is quite homogeneous without significant ethnic or racial divisions. (This, of course, excludes Northern Ireland where bitter religious divides have been immensely destructive). In recent years, Ireland’s strong economic growth has drawn a large flow of immigrants from the elsewhere in Europe (especially Eastern Europe) in search of employment. Much attention to helping them integrate smoothly into Irish society seems to have been reasonably successful. This strong inflow of immigrants has made Ireland one of the few European countries to have strong population growth and has given the country a much better demographic and long term pension and welfare profile than most of the rest of Europe.

The rich-poor gap as measured by the Gini score in Ireland is in the middle of the countries in this study and also at the OECD average, and Ireland is taking serious steps to reduce it further through up-skilling under the labor agreements, regional development policies, and incentives for investment in depressed areas.

Ireland also ranks in the middle on life expectancy, but in terms of quality of life and life-satisfaction scores, it ranks near the top. On the other hand, its sustainable development, emissions, and renewable energy position leaves room for much improvement.
On balance, however, one can say that once the adversarial labor environment was changed social issues and conditions have been a plus rather than a minus for economic development. Regional Development - While the south and east of Ireland have achieved above average disposable per capita income, the Border, Midlands, and Western regions are about 10 percent below the average. To address this imbalance, the plan divides Ireland’s cities into what are called Gateways and Hubs and establishes programs for upgrading the roadways and transport facilities attached to each. It also commits Enterprise Ireland to a series of programs aimed at fostering regional R&D and attracting FDI to these outer areas. Special provisions for extending public services and programs to people rural areas are also included as part of the effort to enhance social inclusion. The objective is stated as: “Develop the full potential of each area to contribute to the optimal performance of the State as a whole – economically, socially, and environmentally.”

Ireland’s long term plan stresses the need for Ireland to meet its Kyoto Agreement targets for reduction of greenhouse gas emissions and even to go beyond these targets to reductions of 15-30 percent from 1990 levels by 2020. In accord with this, the plan calls for $15 of spending on new transport to shift from private cars to public transport. It also includes funds to buy carbon credits and to invest in large scale development of wind energy capacity along with bio-mass, solar, and other alternate energy technologies. The objective here is to obtain 15 percent of Ireland’s energy from renewable sources by 2020 with 6 percent of transport fuels being from renewable sources.

Lessons for Israel

Ireland’s rise from stagnation to leading European economy is an impressive feat that holds several lessons for Israel. Their economic transformation would not have been possible without key investments in infrastructure, stabilization of macroeconomic policy, and an impressive negotiation with the labor sector. However, three Irish policy choices hold the most promise for Israel’s potential improvement.

First, Ireland’s focus on promoting FDI and creating an attractive environment for foreign MNCs has been crucial to their new prosperity. Creating an easy to navigate bureaucracy and setting low levels of corporate taxation have been key to this strategy. The Irish government is particularly intent on attracting high tech and tech services companies to the island, so combining the good business environment with high quality technical infrastructure and a large well educated labor force has made a very attractive locale for tech industry.
Second, the Irish education system has been set up, not only to lure companies in with the promise of a well-developed human capital base, but also to spread the benefits of the country’s growth more evenly. Free primary and secondary education and strong focus on math and science, along with Ireland’s new system of technical colleges, provide the Irish people with the skills necessary to benefit from the tech boom.

Finally, ties to the EU have been especially helpful in spurring economic growth in Ireland. The country is a perfect staging point for outside companies who need to gain access to Europe’s single market. The fiscal discipline imposed on Ireland by EU code was critical in creating a stable, functioning government and economy. Further, structural grants from the EU were essential in helping Ireland establish the infrastructure and educational system necessary to make it a world competitor.
Modern Sweden is known for its elegant, cutting edge design, its skilled engineers, its stable of world class multi-national corporations, and above all, its generous social services. Sweden is in fact the epitome of the modern social welfare state, enjoying one of the highest standards of living in the world while preserving a strong emphasis on egalitarianism, social justice and thrift. But the social contract and economic development strategy under which Sweden operates today took many years of negotiation and compromise to craft, and many of its peculiar features are now under pressure from the forces of globalization.

Indeed, many of the characteristics of the modern Swedish economy are paradoxical. Despite its reputation as a socialist paradise, some of the world’s largest multi-national corporations call Sweden home and a small, concentrated group of investors control the commanding heights of the economy. Sweden has some of the world’s most highly skilled scientists and engineers, but very few start their own companies, instead laboring away in large companies or universities. Roughly 80% of the Swedish workforce is unionized, and yet the country does not suffer from an undue amount of strikes, industrial actions, or even demands for unsustainable pay increases. Sweden has a generous asylum policy, and affords new immigrants access to all of its generous social programs and unemployment benefits. And yet many new immigrants are not being successfully assimilated into Swedish society because they find it very difficult to enter the workforce and do not share many of the cultural values of their hosts.

The sources of these contradictions are to be found in the political compromises made as Sweden built its modern social welfare state. After World War II, Sweden found itself with both a well-developed industrial sector, untouched by the ravages of war, and strong social pressure to build new institutions that could spread the fruits of economic development more widely. The Social Democratic party, which has ruled Sweden for much of the post war period, introduced many new social welfare programs that increased the size and role of the state in the economy at large. But they never abandoned the market mechanism, and furthermore were obliged to craft these new institutions within the context of an already existing industrial economy.

The Social Democrats soon found that it was easier to implement their plans for new social welfare institutions with the agreement of both Sweden’s labor unions and its business community. The new welfare programs required big increases in spending – both from the government and the private sector, but nobody wanted to kill the goose that laid the golden egg by destroying the competitiveness of Swedish
business (at least in the beginning). As such, a series of compromises were hammered out that provided for the creation of many social welfare programs, but which also resulted in the domination of the Swedish economy by large companies, a relative lack of entrepreneurial activity, the locus of R&D spending and innovation in the big firms rather than in the universities or new start-ups, labor policies that afforded protection and a generous safety net but at the expense of weak job creation, and a tax and corporate governance structure that discouraged individual wealth accumulation and encouraged concentrated control of industry.

The so-called ‘Nordic Model,’ that combination of competitive industry and social welfare that Sweden exemplifies, is based on a style of capitalism that encourages, perhaps even depends on, large multinational corporations and a corporate governance model that places control of these corporations in the hands of a few domestic investors. In partnership with the heads of the trade union confederation and a handful of government ministries, these business, labor and political leaders hammer out deals that grants everyone their core demands, but not without compromises. In the case of the business leaders, they are granted control over corporate boardrooms and tax loopholes that keep their capital out of the hands of the taxman, but in return acquiesce to high marginal tax rates on their incomes and corporate payrolls, low returns on their equity and many regulations. In the case of the labor unions, they secure a generous social safety net and benefits for their members, but forego high wages (at least for the more skilled workers) and give up some job protections. The government, for its part, gets social cohesion and a large public budget, but depends on the labor unions to exercise restraint, and the big corporations to fund its payroll taxes, and cannot operate without the support of these two important constituencies.

History and Background

Although Sweden has a long history as a powerful European state, the roots of Sweden’s modern economy lie in the 19th century – an era when many of the major Swedish corporations that still exist today were founded. Indeed, one of the striking aspects of modern Sweden is how many world class corporations this country of 9 million people has produced. From telecommunications to the pharmaceutical industry to automobiles and construction, Swedish firms are some of the largest and most competitive in the world. More impressively still, they have managed to maintain this strength in a country known for its generous social welfare benefits and egalitarian society.

The roots of modern Sweden’s industrial strength lie in the country’s abundant natural resources. Rich in forests, iron ore and other minerals, Sweden began developing these resources in the late 1700’s, often bringing in foreign experts to apply the latest technical innovations and management practices. In the 19th century, the industrial revolution took off, and within a short time the economy had expanded to include such core components of a modern industrial economy as steel making and ship building. The government often acted as the ‘lead market’ in the early days: mines and heavy industry were state owned, but relied on private companies to supply the machinery and provide sub-contracting. By maintaining high standards, the state helped to promote the establishment of several internationally competitive companies by the turn of the century – companies that are in many cases the direct forebears of modern Swedish multi-nationals. Indeed, of the 50 largest Swedish firms in 2000 in terms of revenues, more than 30 had been established prior to 1914.
Following World War II, the Swedish economy entered a golden age of high growth, technological innovation, and rapidly rising living standards. By 1970, Sweden had the fourth highest GDP per capita in the world and was a model of the modern social welfare state. The foundations of this wealth were a number of world class multi-national corporations, a well-educated workforce, a strong social safety net and a political culture that valued consensus and egalitarianism.

High savings and investment rates were an important part of Sweden’s economic strategy during these years. And yet the bulk of savings and investment was mobilized and directed by the government. In 1960, Sweden introduced a mandatory national pension scheme, which directed pension payments (collected through a payroll tax) into national pension funds administered by the state. These funds quickly became a major source of credit in the Swedish capital markets, providing 35% of total credit supply by the early 1970's. At the same time, Sweden's tax structure discouraged wealth accumulation by households and private individuals, resulting in decreasing household savings rates throughout this period and the near complete withdrawal of household funds from the equity markets. This concentration of savings and credit supply in the hands of the government played to the strengths of Sweden's existing large multi-national firms. With their close relationships with the government and the labor unions, their large stock of collateral, and their concentrated ownership structures with links to Sweden's main banking groups, these large firms soaked up the majority of Sweden's supply of capital and credit. Small firms and start-ups were, however, at a distinct disadvantage – lacking in connections, collateral, and more in need of equity than debt financing, these types of firms struggled to raise capital.

Eventually, the post-war boom years led the ruling Social Democratic party to overreach and strangle the economy with debilitating high tax rates, unaffordable social welfare spending, a restrictive regulatory regime, a rigid and inflexible labor market, and a bloated public sector with too many employees and too many state owned corporations that were too often given monopoly powers in the markets.
Thus, the boom years of the 1950’s and 60’s gave way to the stagnation of the 1970’s and 80’s. Macroeconomic stability gave way to high inflation, periodic currency devaluations, large budget deficits and huge levels of public debt. Private sector job growth stagnated, and the state was forced to subsidize and protect (and in some cases nationalize) increasingly uncompetitive companies in an effort to stave off a substantive restructuring of the economic system.

The crisis finally came to a head in the early 1990’s. A botched program of financial market liberalization in the late 1980’s had led to a huge credit expansion and an asset price bubble that, when it popped, wreaked havoc. A massive recession hit the Swedish economy – GDP declined for three straight years, 10% of all jobs were lost, the kroner was forced out of the European exchange rate mechanism (forcing Sweden to abandon its plans to join the Euro), benchmark interest rates shot up to levels over 400bp higher than their German counterparts, and the public debt grew to dangerous levels.
Clearly, fundamental changes to the Swedish model had to be made, but even in this time of crisis, Sweden’s social cohesion and emphasis on consensus never wavered. Despite the massive job losses, the country did not suffer from any major strikes or industrial actions even as scores of factories were shuttered and hundreds of thousands of workers were laid off. In part, this was due to the high level of unionization in Sweden. Because such a large proportion of Swedish workers were unionized, this forced the unions to take a broad view of the competitiveness of the Swedish economy as a whole instead of simply fighting for the parochial interests of each industrial union. But the laid off workers could also be secure in the knowledge that they would receive generous unemployment compensation, free health care, and access to worker retraining programs and lifelong learning that would help get them back in the labor force. Indeed, over one million Swedes participated in adult education programs during the recession to improve their skills or undergo retraining to qualify for new jobs.

Still, the sense of urgency in the country was palpable, and there was recognition that the country needed wide ranging reforms to restore its international competitiveness. This focus on competitiveness led to several major reforms of Sweden’s social welfare model and its approach towards the global economy. Boosting productivity growth, encouraging high technology, opening the country up to foreign investment, tax reform and liberalizing certain product and services markets were all given high priorities during the reform era of the 1990’s.

The telecommunications sector in particular benefited the reforms of the early 1990’s. Sweden already had a prominent incumbent telecom manufacturing firm in Ericsson, but by simultaneously opening up the telecom services market to competition and setting technical standards governing the use of the emerging wireless sector, Sweden laid the groundwork for Ericsson’s explosive growth during the latter half of the decade.

To a large extent, many of the liberal reforms of this era worked: Swedish economic and productivity growth have rebounded sharply from the lows experienced in the early 1990’s. The central bank, which was made independent in the wake of the recession, got inflation under control and stabilized the macroeconomic environment. Sweden’s high-technology sectors – particularly the ICT and pharmaceutical
sectors - have been responsible for much of this growth and have taken the lead in establishing Sweden as an international center for R&D. Export growth has been particularly strong and Swedish international investment expanded sharply. As the country removed restrictions on foreign investment, a wave of mergers and acquisitions followed, bringing with it the highest levels of foreign investment ever seen in Sweden.

Job growth and entrepreneurial activity, however, have been distinctly lacking in Sweden’s recovery and are areas of concern for Sweden’s long term economic health. Indeed, Sweden’s overall business environment remains much friendlier to large multi-national corporations than to small businesses or start-ups. Sweden’s tax structure, labor market, and corporate governance system all still favor large enterprises.

**Education and Innovation**

Sweden has a long tradition of excellent primary and secondary education - the country made primary schooling mandatory in 1832, and this decision helped pave the way for the country’s industrial revolution later on in the century, as new companies used this educated workforce to ramp up production and build new industries.

In modern Sweden, primary and secondary education remains strong, with most schools maintaining high standards and an innovative school voucher program allowing school choice. One of the most impressive achievements of the Swedish school system is the astounding degree of English fluency among Swedes. This strong emphasis on English helps prepare Swedes to participate in the global economy and gives them a strong competitive advantage vis-à-vis other less linguistically capable workers.

Although the central government sets the national curriculum, most of the responsibility for running and funding primary and secondary schools falls to the municipalities. The central government does, however, ensure that funding gaps between poorer and richer school districts are not too large by running a system that transfers some funds to the poorer municipalities.

At age 16, students choose whether to go on to university-prep schools or enter vocational schools. In total, there are 16 different specialized programs that students choose from, ranging from nursing to science and the humanities. Nonetheless, the differences between these programs are not so large – fully one third of the curriculum is the same, and a series of reforms aimed at boosting the number of students who go on to university resulted in many of the vocational schools offering college preparatory courses.

Approximately 45% of Swedish students go on to university after completing high school. There is no tuition – university is free for all – even for foreigners who come to Sweden to study (although foreign students will likely be forced to pay in the future). In recent years, Sweden has made an effort to increase the number of students attending university, and has expanded the number of places available. It has also tried to encourage more students to major in science and engineering programs, and although funding for these departments has been increased (and the number of students taking technical degrees doubled from 1994 to 2004), the government has fallen short of its goals due to a lack of demand. This is a particularly sensitive issue for the business sector, because despite Sweden’s low labor force participation levels (Sweden’s official unemployment statistics mask much of the real unemployment) businesses are having an increasingly difficult time recruiting qualified workers. Sweden’s education sector has not done a good job coordinating with the private sector over what types of skills and qualifications are in demand in the labor market.

Some critics have charged that the governments’ funding procedures for the universities have resulted in skewed incentives that have pushed down standards and limited the ability of Swedish universities to serve the needs of the labor market or match the achievements of the leading US schools. First, the central
government makes tuition payments to Swedish universities based not on how many students are currently enrolled, but on how many students graduate. So if a student enrolls but does not graduate, the school doesn’t get paid. This creates an incentive for the schools to lower their standards and let unqualified students graduate. Second, most university research funding in Sweden comes from the state. Over half of state funding is granted to the universities without a system of peer review or even a competition for the funding. It is simply allocated by the government on the basis of x amount for chemistry, x amount for physics and so on. This system is not conducive to promoting excellence in research.

In general, the role of Sweden’s universities in the country’s R&D programs is mixed. In a few areas, particularly medicine and pharmaceuticals, Sweden’s universities enjoy strong ties with industry through joint research programs and hospital based medical trials. Pharmaceutical companies have also helped the largest and most prestigious universities develop several centers of excellence by helping to fund clinical research programs. Elsewhere, however, most Swedish R&D has been centered in corporations or the defense sector. Sweden spends roughly 4% of GDP on R&D, but less than one quarter of this funding comes from the government. Ericsson’s R&D budget alone matches that of the government.

Another unique feature of Sweden’s higher education system is that the intellectual property rights for any research done at a university goes to the professor or professors who undertook the research – and not the university. In theory, this system is supposed to encourage entrepreneurial activity by giving academics the prospect of profiting from their work. Especially since Swedish engineers and scientists are paid relatively low wages by international standards, granting them IPR was seen as an important incentive. But since Sweden’s tax, labor, and capital market systems are so heavily skewed in favor of big companies at the expense of small start-ups, these IPR rules have not been enough to encourage entrepreneurialism on a large scale. Even worse, it has limited the incentives for universities to actively engage in commercial R&D or incubate new start-ups.

Still, it would be wrong to characterize Swedish public policies as being antithetical to innovation. It is simply that Swedish policies tend to encourage R&D work and innovative activities within existing institutions and companies. In fact, many of Sweden’s social welfare programs are a net benefit to the country’s capacity for innovation. For example, Sweden’s subsidized pre-school and day care centers encourage the entry and retention of women in the workforce. Its educational system, while not without
flaws, does succeed in producing many highly skilled engineers, scientists, and managers for Swedish industry.

One area where the Swedish educational system does lead the world is in adult education and life long learning. Sweden boasts the highest levels of adult education rates in the world, with more than one million Swedes participating in adult education programs every year. Adult education programs in Sweden are administered by the municipalities, but much of the funding for these programs comes from the central government. In the 1990’s, when roughly 10% of all Swedish jobs were lost, the Swedish state significantly increased its funding of adult education programs (to over SK6.3 billion in 2001 alone) and roughly 1.6 million Swedes participated in the 2000-2001 academic year.

In 2004, total spending on Swedish adult education programs was over SK4.5 billion. The Swedish government transferred over SK1.1 billion to the municipalities to provide grants to adult students so they wouldn’t have to borrow money to attend adult education programs. In recent years, state funding has also included grants for upgrading the adult education infrastructure – new classroom facilities, instructors, pedagogical methods, and the like. In 2002, the Swedish government made over SK350 million in such grants to municipalities, and a new adult education law and funding procedure is currently being debated in the Swedish parliament that should extend these programs even further.

Currently, Swedish adult education programs are divided into three categories. These programs are administered either at special adult education centers, or else at secondary schools that have created special programs for adults. Basic adult education targets those individuals, many of whom are immigrants, who lack even the most basic skills – like Swedish language literacy or basic math. These programs often serve as the basis for further study.

The ‘upper secondary’ adult education programs aim to mirror the knowledge and skills taught in the final years of Swedish high schools. The curriculums are much the same, but the Swedes attempt to adjust the content, scope and focus of the courses to meet the needs of mid-career adults. These programs are targeted at Swedish drop-outs or those who have recently lost relatively low-skilled jobs.

Finally, Sweden offers ‘supplementary’ education. These programs are focused on improving the skills and marketability of Swedes at all career levels who want to improve their career options, get training that qualifies them for a new position, or who simply want to broaden their horizons.

The following chart shows the type and enrollment levels of Swedish adult education courses in 2005. The heavy enrollment in Swedish language courses is evidence of the use of adult education programs by recent immigrants. But note as well the enrollment of over 36,000 students in computer science courses and over 56,000 in math.

High savings and investment rates and a historical favoring of debt over equity investments play to the strengths of large firms over start-ups, but they hardly inhibit the ability of those large companies to engage in in-house R&D. Moreover, the governments’ role in setting technical standards or acting as a lead market for certain new technologies (especially in the defense sector) is also a boon to corporate innovation. Perhaps the best way to think about the Swedish model is that it promotes ‘intrapreneurship’ rather than entrepreneurship.
Sweden runs one of the largest and most extensive public sectors in the world. Public sector jobs account for roughly one-third of total employment in Sweden and as a share of GDP; public spending is well above the OECD average at well over 50% for most of the past decade. Large as these figures appear, they have actually declined since the early 1990’s, when the recession put an even larger strain on Sweden’s public sector as unemployment benefits and worker retraining programs skyrocketed.

Despite the size of the Swedish state and budget, it is relatively free from corruption or overt politicization. While cabinet ministers are appointed by the Prime Minister and have overall responsibility for directing the work of the ministry they head, Sweden has a professional bureaucracy that is insulated from overt political manipulation through a system that maintains administrative autonomy in most Swedish government agencies. In other words, once a government has been formed, the Prime Minister and the cabinet set the goals, guidelines, and allocation of funding for each specific ministry and agency, but they may not decide how each agency interprets or implements laws, or how the day to day administrative issues (like staffing) get resolved. These decisions are variously made by the Director General of each agency (who is usually appointed from within the ranks of the agency) or the Board of Directors of each agency, which includes the Director as well as senior administrators, and sometimes representatives of the special interest groups that are affected by the agencies’ operations.

Each agency or ministry does, however, have to follow state issued guidelines for procurement and employment policies, among others. Further transparency is achieved through a public information act that mandates that all government documents not explicitly restricted due to security considerations or personal privacy concerns are open and available to the public.
Swedish financial market regulation, tax structure, and labor market policies have all combined to promote a unique model of corporate governance that has concentrated the ownership of the Swedish corporate sector in a very few hands while also encouraging the development of large multi-national companies.

Like much of continental Europe, Sweden’s corporate governance model retains dual shareholder classes that give different voting weights to different classes of shares. In many circumstances, this allows minority shareholders to retain control over publicly-traded corporations, even though their share of the outstanding shares can be very small. Sweden has a much smaller pool of domestic capital than many of the larger countries of continental Europe, and as a result equity ownership in Sweden has been much more concentrated than elsewhere.

In some cases, this dual share structure has allowed the descendents or families of a firms’ original founder to maintain control over the original company years after it has been listed on the stock market. The most important investors in Sweden, however, are special investment funds closely associated with the country’s three largest banks. These special investment funds trace their origins to the first half of the 20th century. In the early years of the century, the Swedish parliament passed a number of laws that restricted foreign ownership of Swedish corporations in favor of domestic investors. Later, in 1934, Sweden passed its own version of America’s Glass-Steagall Act, which forced banks to divest their equity holdings in order to remove perceived conflicts of interest. Swedish banks, though, did not simply sell their shares onto the stock market. Instead, they formed new holding companies structured as closed-end investment funds and foundations which retained the shareholdings of the banks on their books. These holding companies and foundations were, in turn, also governed by a dual share voting structure, which allowed for an unprecedented concentration of ownership of the Swedish economy.
Basically, a small number of individuals and institutions controlled these holding companies through minority shareholdings of ‘Class A’ shares that had special voting rights. The holding companies, in turn, controlled the boardrooms of most major Swedish companies through a further set of special ‘Class A’ shares. Controlling stakes could thus be amassed through the ownership of a very small percentage of the total amount of shares outstanding.

This feature of concentrated institutional control of the Swedish corporate sector accelerated sharply in the post-war years as the ruling Social Democratic party sought a consensus over its plans to build Sweden’s social welfare state. Fewer corporate owners would mean that there were fewer seats at the table during the negotiations to determine how Sweden’s new welfare institutions would be built and paid for – and hence a consensus could more easily be arrived at. This ownership structure also benefited the Swedish economy in a number of other ways. Even though large Swedish corporations were technically very open to international trade – they were big exporters and had operations that spanned the globe – concentrated domestic ownership protected these firms from foreign takeovers that could lead to the outsourcing or redundancy of many jobs. It also encouraged the creation of higher value added jobs in Sweden, for example in R&D and management, which might otherwise have been located elsewhere.

In addition to financial market regulations, a number of other factors contributed to this corporate governance model and also to the development of large Swedish firms. Despite Sweden’s well deserved reputation as a high tax jurisdiction, the tax burden falls more heavily on individuals than on corporate profits.

In general, the tax system has strongly discouraged wealth accumulation by individuals even as it encouraged concentrated institutional ownership of the Swedish corporate sector. It did so by effectively exempting Sweden’s investment funds from capital gains and dividend taxation. At the same time, regular households suffered from exorbitant capital gains and dividend taxes. While the specific tax rates, exemptions, and loopholes changed over time, the net effect was to transfer an ever increasing share of ownership away from Swedish households and individuals towards the special investment funds. In addition, Sweden’s tax structure heavily favored debt financing to equity financing, which is to the advantage of large firms with close relationships to the big banks, and the disadvantage of smaller companies and start ups that either lack the collateral or are too risky to secure debt funding.
It is also important to note that Sweden has never given tax incentives or other benefits to foreign firms to encourage foreign investment in Sweden. On the contrary, for many years Sweden maintained laws that restricted the ability of foreign firms to amass shareholdings of Swedish firms, and until recently, jealously guarded domestic control over the business sector. And while Sweden has long been open to greenfield investment by foreign firms, it has never given them any special incentives to do so that were not also available to Swedish companies, and in general does not grant any firm or individual exemptions from its rules and regulations. In Sweden, rules are taken seriously and meant to be followed.

Perhaps the most widely known and important holding company in Sweden is Investor AB, which is controlled by the Wallenberg family foundation and is closely linked to Stockholms Enskilda Bank, or SEB, which is also controlled by the Wallenbergs. Unlike more passive investors like pension and mutual funds, the Wallenbergs are active shareholders in the sense that they are actively involved in the management decisions of the companies they invest in. They seek to appoint not just the Chairman of the Board, but also the Chief Executive and often the Chief Financial Officer of their firms. No major decision, like a new business line or a merger or acquisition, takes place without their agreement.

It is this very ability to act as a controlling shareholder – to make management changes, strategic decisions and the like, that is at the heart of the Swedish corporate governance model. Companies in other countries with diffuse ownership structures operate under a different set of incentives. Some might focus on short-term returns to shareholders who have invested simply to make a quick buck, while others get ‘captured’ by management and award large compensation packages and other benefits to senior executives. This is not to suggest that a diffuse share ownership is necessarily bad, but the Swedish model affords the luxury of a long term perspective and a controlling investor who is sensitive to the best interests of the workforce and the country at large.

It is notable, however, that this model is coming under increasing strain as the Sweden opens itself up to foreign investment and financial globalization changes the incentives facing investors. In Sweden in the second half of the 20th century, investors like the Wallenbergs made an implicit bargain with the state – give us management control and protect our capital from the tax service, and we will go along with your plans.
for the welfare state and try to make investment decisions that are in the best interests of the national economy. But another consequence of this deal was that Swedish investors earned very low returns on their equity. Demand for Swedish equities had been artificially reduced by both the tax structure which favored debt financing and the dual share structure which gave control to minority investors.

As international investing has become easier in recent years, the trade off of control for lower returns has become less appealing. Swedish investors have expanded abroad, seeking out higher returns and diversifying their risks. By the same token, foreign investors and other institutional investors like pension funds have become more active in the Swedish capital markets.

It is unclear how these changes will play out in the future. Over the past decade, Sweden has seen an enormous increase in foreign direct investment and a number of major Swedish companies have come under foreign control. The SAAB and Volvo automotive businesses, for example, are now parts of GM and Ford respectively. The pharmaceutical sector has also seen consolidation, with Pharmacia taken over by Upjohn of the US (a move which resulted in major job losses in Uppsala, which ironically resulted in one of the highest concentrations of bio-tech start-ups in Sweden after the laid off workers founded new firms), and Astra joining with Zeneca of the UK. While much of the high-value added work (such as R&D) in these foreign owned companies have remained in Sweden, they have also engaged in much offshoring of lower-skilled positions. The jobless economic recovery that Sweden has seen since it emerged from recession is one consequence of this trend. At the same time, increased Swedish investment abroad has been driven at least in part by a desire to lower wage costs and shift production offshore. Swedish owned multinationals have been much better at creating jobs outside of Sweden than inside over the past decade.

The economic crisis of the 1990’s, the impact of globalization and the deregulation of the financial sector have begun to undermine and transform the Swedish model of corporate governance. The incentives underlying the implicit bargain reached by investors and the government in the post-war period, under which a small group of investors were granted unprecedented control over corporate boardrooms but in return lived with low equity valuations and low returns on their capital, began to change. After Sweden opened up its capital account and removed restrictions on foreign ownership of Swedish firms, foreign direct investment in Sweden took off. In addition, the increasing importance of pension funds as equity investors has changed the nature of institutional ownership for many Swedish companies.
Low-Tech

There has been one notable exception to the general rule that the Swedish economy has failed to generate any new large companies in the post-war era. Sweden’s retail sector has seen the emergence of two large successful companies in Ikea and H&M. A good part of these companies success’ stems from their ability to overcome the problem of high labor costs in Sweden.

In the case of Ikea, which was founded in 1943 but did not enter the retail furniture business (its main business line) until 1953, the challenge was to sell well-designed, high quality furniture at an affordable price. With the rise of the social welfare state in Sweden following the war, the cost of hiring workers, especially low-skilled workers who could assemble furniture, grew quickly. Most furniture makers were craftsmen who built high-quality furniture but demanded premium prices out of reach of the majority of Sweden’s middle class.

Ikea solved this problem with three notable innovations. First, the company began designing its furniture to be assembled by the customer. Instead of taking home a ready made table or chair, the customer would leave the store with a box containing all the necessary components of the furniture and a manual detailing the assembly instructions. Second, Ikea designed its furniture with an eye to the size and shape of the box it was packaged in. By keeping the packaging as compact as possible, Ikea reduced transportation costs and was able to pass those savings on to the customer. Third, although Ikea’s design and marketing departments are located in Sweden, its manufacturing facilities are located in low-wage developing countries, further reducing costs.
Ikea’s great success, first in Sweden and subsequently internationally, has had a positive impact on productivity growth in Sweden’s retail sector and contributed to rising living standards by improving the purchasing power of middle class consumers. It has not, however, done much in the way of job creation in Sweden and the question remains as to the extent to which Ikea has really been a benefit to the Swedish economy at large.

In part, this is due to a fourth innovation pioneered by Ikea’s founder Ingvar Kamprad: tax avoidance. Kamprad left Sweden in the 1970’s and moved his primary residence to Switzerland to avoid high Swedish income taxes. Around the same time, Kamprad began creating a complicated series of shell companies and non-profit foundations in various European jurisdictions designed to lower Ikea’s tax burden. In fact, despite Ikea’s Swedish origins, it is no longer registered as a Swedish company; instead it is incorporated in the Netherlands and controlled through a series of foundations registered in Luxembourg and several offshore financial centers in the Caribbean.

## Labor

Sweden is characterized by one of the highest union participation rates in the world, and yet the country has relatively few strikes or industrial actions by union members. The Swedish Labor Organization, the umbrella organization for Sweden’s unions, represents approximately 80% of Sweden’s workforce. The strength of the white collar labor unions in Sweden is notable.

![Union Density in percent - Sweden](image)

Sweden has a centralized wage negotiating system. In the past, these negotiations were tightly managed by the Swedish Labor Organization and the Business Confederation, but recently this top-down control has relaxed a bit and more of the negotiations have taken place at the branch level. From labor’s standpoint, the way it works is that the LO will begin by analyzing the economic data and making some recommendations.
to its branch members. It will look at the overall inflation rate and the productivity growth rates for each respective industry and suggest that a particular union should ask for an x% increase – in other words an increase in line with the inflation and productivity rates. While these recommendations are not binding, they do set the tone and are often expected by the member unions.

The negotiations are organized around industrial sectors and they do not take place all at once. Rather, the tradition (which has not been formalized in law but is the result of tacit agreement) is that the manufacturing and engineering industries go first, as they are the most exposed to international competition, and then the other sectors follow. This negotiating process tends to result in a relatively compressed wage structure. In other words, skilled workers tend to earn much less than their counterparts in the US, UK, Germany or Switzerland. In some respects, this system is good for the Swedish economy. The costs of operating R&D centers in Sweden, for example, are very competitive internationally, despite the country’s tax structure and labor market regulations. On the other hand, wages for relatively unskilled labor are much higher than the OECD average. While this system is in line with Sweden’s egalitarian values, it is not without consequences for the Swedish economy.

Sweden’s labor market is not exactly inflexible, but it does contain important job protections that are especially burdensome for small businesses. Under Swedish law, workers can only be fired for gross negligence or if the position itself is eliminated. And regardless of the reason, layoffs carry steep costs, as unemployment compensation in Sweden is generous and long lasting and the company has to bear the burden of these costs. But tenure in Sweden is based on seniority, so if you do need to shut down a factory or lay off a portion of your workforce, you are supposed to do so under the principle of ‘last in, first out.’ In other words, the most recent hires are the first to be shown the door, regardless of their productivity or industriousness compared to workers with more seniority. In practice, there are some loopholes to this standard, as employers can negotiate with their unions as to which employees will actually be let go. But in general the rule holds.

There are two important implications of this rule. The first is that it is easier for large companies to manage their labor issues than small companies. Large firms can generally afford the costs of layoffs and have the managerial capacity to engage in negotiations with the unions as to the extent and specifics of the layoffs. Small firms, especially young ones, find it much harder to manage.
Second, companies are quite wary about hiring new employees. Hiring someone is a real commitment in Sweden – you’d better be sure they’re qualified and hard-working, because it won’t be easy to get rid of them if they’re not. Sweden’s record on job creation has been quite poor in the past decade, despite its otherwise strong economic numbers. This is particularly true of young people, where unemployment rates are very high.

These problems are compounded by the fact that Sweden’s social welfare policies include extremely generous provisions for sick leave and parental leave, and the fact that many corporations have used early retirement packages to help achieve workforce reductions instead of simply firing people.
Denmark’s ‘Flexicurity’ System

Denmark’s system of ‘flexicurity’ is designed to combine a flexible labor market with very few job protections with an efficient social safety net and active labor market policy that provides unemployed workers the support and resources necessary to get back on their feet and reenter the labor market. The overarching goals of the reforms that led to this model were to increase job creation by making it easier for companies to adjust their labor forces to meet market demand; to remove the disincentives to hiring new employees; and to actively help the unemployed reenter the labor market by offering job placement services, retraining programs and adult education, and other support. In effect, Denmark has tried to replace job security with employment security – where a dynamic labor market constantly creates new jobs, and individuals constantly improve and adapt their skills to meet labor market demand.

Since Denmark instituted its flexicurity system, it has halved its unemployment rate – from 12.4% in 1993 to 5.7% in 2005. Denmark has also succeeded in reducing the amount of time that people remain unemployed – fewer than 25% of unemployed persons have been out of work for more than a year, the lowest in the EU. It now has the highest rate of job turnover within the EU – on average 30% of the workforce, or roughly 700,000 people, change jobs each year. High turnover in and of itself means that there are more job opening available.

To begin, Denmark did away with the ‘last in, first out’ labor rules and made it possible for employers to fire workers for almost any reason. This policy stands in contrast to the rest of the Nordic countries, where it is possible to dismiss workers by eliminating a position, but much more difficult to dismiss workers for performance related issues. The counterpart to this flexibility, however, is very generous unemployment benefits – which are not funded by employers. This means first that employers do not have to pay high levels of compensation to laid-off workers, and second that payroll taxes are not a disincentive to job creation.
When a worker is let go, the Danish employment service takes an active role. In order to receive unemployment benefits, an individual must register with the employment service where he is assigned a case worker who prepares an ‘action plan,’ for getting the individual back into the labor market. Unemployment benefits have time restrictions, with the level of support dropping as time goes on, thus increasing the pressure to find a new job. The maximum amount of time an individual can keep receiving unemployment benefits is now capped at four years. In addition, low-income groups get higher initial benefits, as a proportion of their wages, than high-income groups, meaning that benefits are means tested.

Adult education programs are also available to individuals who want to prepare for a new career or gain new qualifications, but the emphasis is on job-specific training programs as opposed to vaguer skill-enhancing classes. Moreover, the employment service may present unemployed individuals with job prospects that must be accepted. After a certain period of time, usually six months to a year, if a job is available for an unemployed individual that person must take it or lose his access to benefits.

It is important to note here that Denmark’s employment service serves two clients. On the one hand, they try to get individuals back into the labor market. On the other, they try to assist the private sector in finding qualified applicants for job openings. Because of this role, the service is cognizant of the need to match labor market demand with the right mix of skills in the labor force. This emphasis on matching skills with labor market demand has meant that, as mentioned above, Denmark has managed to bring down its unemployment rate substantially. But it also means that Danes with specific skills and qualifications have been more successful at finding jobs than individuals lacking in specific skills or possessing merely basic qualifications. As the chart below shows, those with a tertiary education or a vocational education are much more in demand than those with merely a secondary degree. The chart also points to the very high levels of early retirement in Denmark, for which the country’s high level of social and pension benefits are responsible. Measures to encourage labor force participation later in life are now being debated in the Danish political system.

![Labour force participation rate high for skilled workers](chart.png)

**SOURCE:** Special report from Statistics Denmark.
Danish labor unions and the system of collective bargaining have also played an important part in the success of the flexicurity model. Over 85% of the Danish workforce is covered by the collective bargaining agreements, and the agreements themselves are governed by the so-called ‘peace accords,’ which effectively rule out strikes during the period that the new agreement is being negotiated. When conflicts do occur, mediation and compromise are encouraged as a means of avoiding labor stoppages.

More importantly, Danish labor unions run most of Denmark’s unemployment insurance programs. Roughly ¾ of all Danes are member of voluntary unemployment insurance schemes run by the unions and pay fees to cover the premiums. The rest receive state benefits if they become unemployed. Although union membership is not legally required to join the unemployment insurance funds, in practice this system encourages membership in the unions but also gives them incentives to get people back to work. Also, as in other Nordic countries, the high levels of labor union participation rates have encouraged Danish unions to take a broad view of the competitiveness of the national economy and thus accept wage restraint in return for higher job creation levels and unionization rates.

The unemployment insurance funds do not, however, cover their expenses from the fees members pay, requiring subsidies from the state. While the total costs of these funds vary with the unemployment rate, for most of the 90’s the funds covered only one quarter to one third of their total outlays.

The flexicurity model is not cheap – Denmark’s unemployment benefits and labor market programs cost nearly 5% of GDP annually. But the lesson of this Danish experiment is that the best elements of the Nordic and Anglo-Saxon economic models can be combined. Highly flexible and efficient labor markets can coexist with generous social welfare policies that promote social justice and human capital development.

**Lessons for Israel**

Sweden has been very successful in ensuring that the benefits of its economic growth and technological development are spread widely throughout its society. While its high tax rates and sometimes heavy-handed regulations and labor market rigidities have to some extent stifled entrepreneurialism and job creation, the upside of these policies has been sustained and generous investments in human capital that have produced one the most highly skilled and educated labor forces in the world.

Sweden’s openness to international trade, investment and technology has allowed the country’s corporate sector to make the most of these investments in human capital, and the country’s consensus-driven political system has enabled the Swedish economy to adjust to the increased competition arising from globalization by shedding low-skilled jobs and moving up the value chain. That Sweden has done so by nurturing its large corporations at the expense of new start-ups speaks more to Swedish cultural and social values than to any fundamental weakness in its economy. Swedish labor, for example, has consistently shown itself willing to make concessions during economic restructurings and act as a constructive partner to big business rather than an opponent because it knows that the corporate sector values highly productive, as opposed to cheap, labor.

The point here, and the lesson for Israel, is that public policies play a huge role in determining what types of companies, and what business sectors, will prosper and grow. Different models of corporate governance, different tax regimes, different labor market regulations, and different educational systems all conspire to favor some types of businesses over others. In the case of Sweden, the beneficiaries of these policies have tended to be large existing multi-nationals. But international competitiveness and technological innovation have always been at the forefront of Sweden’s economic policy goals, and the country’s business labor and
political leaders have usually managed to set aside their parochial interests and work together towards outcomes that are in the best interests of the country as a whole.

Background

When Britain’s Sir Stamford Raffles arrived in 1819, what would become Singapore was no more than a small village of 120 fishermen. But the trading post that Raffles created gradually became an emporium that attracted people from all over Asia and especially from China by offering opportunities for a better life that did not exist in their home countries. Singapore eventually became not only the key entrepot and economic hub of Southeast Asia with over a million people of various ethnic and racial backgrounds, but also Britain’s major military base in the region as well. Indeed, so important was it that in his memoirs Winston Churchill described the fall of Singapore to the Japanese in 1942 as perhaps the single most devastating blow of World War II for him.
Although it is located at the tip of the Malay Peninsula, Singapore was long governed by the British as part of the India jurisdiction rather than as part of the colony of Malaya. As preparations were made for the independence of Malaya, however, Singapore became a self-governing territory in 1959 and a certain Lee Kuan Yew was elected as the first governor. At the time, the communist party was very strong and Lee’s socialist People’s Action Party allied with them to win the election and govern. Once elected, however, Lee moved to isolate and eventually crush the communists. Because its economy was tightly linked to that of Malaya, Singapore joined itself to Malaysia when the former colony became independent in 1963.

However, this proved to be a difficult union. While Singapore was 75 percent ethnically Chinese, Malaysia was 65 percent Malay and was committed to maintaining Malay dominance by means of political and economic measures that were preferential to Malays. Bloody race riots occurred regularly and in August, 1965, Singapore parted from Malaysia and became an independent city-state. With a land area of only 700 square kilometers, a racially and ethnically mixed population of 2 million people who had no sense of identity with a country called Singapore, hostile neighbors who were practicing openly confrontational policies, no natural resources, unemployment of 14 percent, and a per capita GDP of $400, the new nation’s prospects did not look good. There were two overriding priorities – security and jobs.

By definition, an independent country is not independent unless it can control its borders and provide security to its citizens. During their rule, the British had recruited mostly men of Malay ethnicity to man the police and security forces. This was in large part because Chinese tended to shun military duty. Indeed, a well known saying at the time was: “hao han bu dang bing, hao tie bud a ding” (a good lad does not become a soldier, good steel does not become nails.). Wise as this may have been, it meant that at its founding as an independent country, Singapore had few security forces and those that were in place were sometimes actually under Malaysian command and often subject to competing loyalties. In view of the “konfrontasi” policy of Indonesia and the strong sentiment among some Malaysian leaders to regain control of Singapore, it was necessary for Singapore to create its own armed forces from scratch. But for this it would be necessary to have assistance from outside since no one in Singapore had any expertise.

At this critical moment, Lee directed his new defense minister to call Mordecai Kidron, the Israeli Ambassador to Bangkok. A few days after separation on August 9, 1965, Kidron flew to Singapore to offer help and to assess the situation. In November, a team of six “Mexicans” led by Colonel Jak Ellazari arrived to begin training and this group was followed by another six “Mexicans” in December. Of course, they weren’t Mexicans, but their identity was kept quiet in order to avoid arousing tension with Indonesia and Malaysia which were both Muslim nations. In January, 1968, Singapore also bought 72 French-made light tanks and 170 armored vehicles from Israel at what were said to be very good prices. This help at a time of need cemented firm relations between Israel and Singapore that have endured over many years. It also provided a basis for development of a strong sense of national identity and pride among Singaporeans. As Lee has emphasized in his memoirs, he had to overcome the reluctance of the Chinese traders and merchants to undertake military duties and instill in them a new more national mentality so that Singapore could have a citizen army like those of Switzerland and Israel. In achieving this and in creating a credible deterrent that assured Singapore’s safety, Lee relied heavily on his Israeli advisers.

While assuring security was the immediate first necessity, the all absorbing passion of Singapore’s leaders for the next forty years was to be jobs and economic development. Indeed, these leaders really saw no difference between security and jobs. In their view there could be no security if there were not enough jobs. They also saw economic development as a way to achieve defensive power through technological and productive superiority. Beyond this, they had the driving passion of the once colonized to prove that Asia could be first world too. In the discussion here, we will discuss the policies, practices, and strategies that enabled Singapore to go from a per capita income of $400 in 1965 to over $30,000 today. But it is very important for the reader to understand that central to everything was the absolute dedication of Lee and his team to take Singapore from the third world to the first—not only to the first, but to the top of the first.
This was their highest priority and anything that was undertaken was undertaken to serve this goal. In short, they wanted to compete and win.

**Legacy and Strategy**

We have already noted that Singapore’s prospects seemed at first glance to be not very promising. But beside the negatives noted above there was also a list of positives. Location was one of them. Raffles had chosen Singapore for his trading post because of its deep water port situated at a natural crossroads on the sea route from East Asia to South Asia, the Middle East, Africa, and Europe. In 1965 as globalization was rapidly accelerating, this location was all the more strategic and valuable. Moreover, while it is generally accepted that tropical areas face economic disadvantages because of the greater prevalence of diseases and the need to move more slowly, it is also a fact that proximity to the sea is a huge economic advantage everywhere in the world. So, on balance, Singapore’s location was a significant plus.

Nor was it just a matter of the specific geography. As a result of its convenient location, the British had made it a center of processing for imported rubber, tin, and palm oil from neighboring areas. This led to development of ancillary industries such as shipping, insurance, banking, and communications infrastructure. A merchant tradition and the constant flow of peoples from all ethnic backgrounds and religions had created a community with facility for languages and for cross cultural dealings that was alert to opportunity and with energy and the spirit of enterprise. In addition, there was a strong British legacy that included a functioning and relatively high quality civil service, political and legal institutions that upheld the rule of law, and the best schools in the area whose graduates went on to Oxford and Cambridge and came back to form an effective business and government elite. Of course, the English language was a unifying element and the physical infrastructure of roads, communications, port and airport facilities, electric power generation, and water supply were relatively good as befitted the military, commercial, and administrative HQ of the British Empire in Southeast Asia.

But this hub had been cut off from its natural hinterland of Malaya and Indonesia. On the one hand it was totally dependent on the outside world for food, energy, and drinking water. On the other, it was no longer receiving its normal flows of raw materials and semi-processed goods for further processing and onward shipment because Indonesia and Malaysia sought to divert such flows to their own ports and processors. As unemployment climbed toward 14 percent and housing remained in critically short supply, the already militant and communist dominated labor unions became even more confrontational than normal and thousands of work days were lost to strikes and industrial actions. The situation required some completely new “out of the box” solution, and at this moment Dutch economist Dr. Albert Winsemius arrived on the scene to say he had it. Lee was baffled when Winsemius explained that the government should under no circumstances remove the statue of Stamford Raffles from the center of the city. But Winsemius explained that the solution for Singapore was to attract technical, marketing, managerial, and entrepreneurial know how from America and Europe. Unlike Hong Kong to which many Chinese entrepreneurs and business leaders had fled from Shanghai and elsewhere in mainland China, Singapore did not have these kinds of people and their skills. So the idea was for Singapore to become a kind of manufacturing and export platform for western companies anxious to cut costs by taking advantage of inexpensive labor. But, explained Winsemius, the western leaders would be watching the Raffles statue as a sign of whether the new Singapore government would be friendly to foreign business or out to make anti-colonial nationalistic points. Needless to say, the statue stayed and the new strategy was fully embraced. Indeed, Lee extended it in two key ways.

It was generally believed at the time that multi-national companies (MNCs) would only do labor intensive, low value added work in places like Singapore. But Lee had learned during a sabbatical at Harvard that fast,
reliable, and inexpensive air and sea transport made it possible to move any kind of industry to a new location if there were skilled, disciplined workers and a stable, efficient government to facilitate the process. So Singapore's strategy became to attract MNCs that would transfer technology and training and constantly upgrade their operations. Since the Japanese, Hong Kong, and Korean businesses were hesitant about this, Singapore targeted the Americans. Lee noted that Israel had been cut off from its hinterland and had solved the problem by leapfrogging the Arabs to trade and do business with America and Europe. He determined to do likewise. But Lee said he also wanted to go beyond this and do something the Israelis couldn't do because they were at war with their neighbors. He wanted to create a First World oasis in a Third World region. He reasoned that if Singapore could establish First World standards in public and personal security, health, education, telecommunications, transportation, and services, it would become a base camp for entrepreneurs, engineers, managers, and other professionals who had business to do in the region. Lee says in his memoirs: "This meant we had to train our people and equip them to provide First World standards of service. I believed this was possible, that we could re-educate and reorient our people with the help of schools, trade unions, community centers, and social organizations. We had one simple guiding principle for survival: Singapore had to be more rugged, better organized, and more efficient than others in the region. We had to make it possible for investors to operate successfully and profitably in Singapore despite our lack of a domestic market and natural resources."

**Economic Development Board (EDB)**

To drive this MNC led industrialization and export led strategy, Winsemius suggested the establishment of a one-stop agency so that a potential investor need not deal with a multitude of different administrative bodies. Thus the EDB was established in August, 1961 to take the lead in attracting investment from MNCs and to sort out all of such investor’s requirements with regard to things like land, power, water, and environmental and safety needs. To staff the EDB, its first Chairman, Hon Sui Sen, chose an Israeli, E.J. Mayer, to be his first Director. These two leaders were given the choice of the brightest students who had been awarded government scholarships to study at universities abroad and were now returning to begin working in Singapore. Thus the EDB was formed from the beginning to be an elite corps with great esprit that would drive the building of Singapore’s future. Eventually, many of this early group rose to rank among Singapore’s top leaders. But they began by focusing on four industries recommended by Winsemius – ship-breaking and repair, metal engineering, chemicals, and electrical equipment and appliances.

The first efforts established a pattern. EDB built the Jurong industrial estate which eventually extended to 9,000 acres with roads, sewers, power, gas, and water all laid out. Within the park industrial sites were made available to potential investors for a nominal rent. In addition, investors got tax-free status for five years that was later extended to ten years after 1975. There were also provisions for training labor and for the Singapore government to take equity positions as a partner in the new investments. Of course, financial and other assistance to promote exports was also liberally available. The start was slow. Initially, any investment was welcomed. One early effort was a sawdust plant and another involved fish hooks. Several failed. An important success came in 1967 when Shell Oil committed to establishing a refinery, and then a major break came in October, 1968 when Texas Instruments (TI) agreed to establish a plant to assemble semiconductors and was able to get it up and running within 50 days of making the decision. TI was quickly followed by National Semiconductor, and shortly thereafter, Hewlett-Packard joined the party as well. From here it was all downhill. In the 1970s GE set up six different facilities and became Singapore’s largest employer. When British forces finally left Singapore in 1971 (after a sojourn of 152 years), 70,000 people who depended for work directly or indirectly on the British bases lost their jobs. Yet unemployment did not rise because these workers were immediately soaked up by the booming U.S. MNCs. Singapore had taken off.
(Little things can mean a lot – In his memoirs, Lee Kuan Yew notes that the CEOs of companies considering investment in Singapore would often visit him. He recounts that he thought the best way to convince them to invest was to ensure that the roads from the airport to their hotels and to his office were neat and lined with shrubs and trees. Said Lee, “without a word being said they would know that Singaporeans were competent, disciplined, and reliable, a people who would learn the skills required soon enough.”)

Thus by the early 1970s the challenge was no longer jobs, but what kind of jobs. EDB began to become selective about the kinds of MNCs and investment it sought to attract. From about 1973 to the early 1980s, the theme was technological catch-up, and the focus was on attracting investment from skill and technology intensive sectors such as electronics, pharmaceuticals, computers, precision engineering, and other industries that generated higher value-added per worker. In addition to the provision of ready-made industrial infrastructure, the main incentives were targeted exemptions from taxes on profits on specific investments or on income streams from certain products or from exports. Also very important was the establishment of state subsidized training centers that were operated jointly with the MNCs to build engineering and other skills.

As wage levels increased in the 1980s, EDB focused increasingly on capital intensive production such as semiconductor wafers and petro-chemicals. After the recession of 1985 revealed the danger of over concentration in a few industries, there was also an emphasis on diversification into such things as air transportation, logistics, bio-technology, R&D facilities, and attraction of corporate regional headquarters. This move toward a more technology and knowledge-intensive economy continued through the 1990s. Significantly, Singapore and EDB did not abandon or acquiesce in the off-shoring of older production. Rather, great effort was made to upgrade production and to move from mere production to complex production, design, R&D, and to overall logistics management. Thus, Singapore remains today the largest disk drive manufacturing country despite having much higher wage levels than other competing countries. The logical extension of this trend since 2000 has been to drive toward an integrated innovation economy based on what is known as the CORE strategy.

![FDI Inflows - Singapore](chart)
One cannot speak with a high ranking Singapore official or businessperson today without hearing the acronym CORE that summarizes the key elements of Singapore’s current strategy. They are: Connectivity – Openness – Reliability – Enterprise.

Singapore aims to maintain itself as the key connecting hub in Asia. The 27 million containers handled annually by the Port of Singapore make it the world’s busiest port and dwarf the 10 million handled by Rotterdam. An example of the combination of the four elements is the fact that Australian producers ship ice cream to Japan via Singapore. Singapore has also become a major gateway to India because it can get cargo to destinations in India faster than Indian ports. Singapore also clears 2,000 flights a week through Changi Airport to 50 cities in China and has a total Internet bandwidth of 26 terabits per second. While maintaining its legendary openness and reliability, Singapore is fostering development of venture capital groups while also trying to attract such groups from abroad. It is aiming to establish clusters that will promote innovation but that will also focus on integrating the entire value chain. Since technologies are converging, Singapore is providing inter-cluster linkage. Thus, the electronics cluster is closely linked to the plastics cluster. The iPod is produced here and, of course, combines plastic packaging with electronics. Other areas of opportunity and focus include, making Singapore a center of business education, software development, water treatment, advanced medical care, and interactive media activity. Firms like Lucasfilm, for example, have been among recent investors and are expected to generate 3 percent of GDP by 2018. There is also an effort underway to make Singapore into the regional hub for private banking, tourism, marketing, and biomedical analysis.

To accomplish this, EDB has a high quality staff, recruited from among the top students who are awarded government scholarships to study at prestigious foreign universities. These students return after graduation to serve in the elite government agencies. Although formally a division of the Ministry of Finance, EDB has an independent budget and makes independent investment decisions. Its 19 foreign offices act as a kind of super commercial diplomatic corps constantly scanning the business landscape for attractive companies and technologies to be attracted to Singapore.

**GLCs, Temasek, and GIC**

The main thrust of Singapore’s get rich strategy was to industrialize and move up the scale of skill and value added by persuading MNCs to transfer production, development, and eventually R&D to the island city state. The main agency driving the export led growth strategy was, of course, the EDB. But its work would not have been successful without the support of a myriad of other agencies and policies that coordinated and integrated with work with that of EDB so that Singapore presented the most attractive complete package.

But the development of Singapore has not been entirely a matter of inducing foreign MNCs to invest. EDB also spawned a large number of indigenous enterprises. Thus National Iron and Steel Mills, Neptune Orient shipping lines, Singapore Airlines, Singapore Petroleum Corp., Singapore Technologies, Insurance Corporation of Singapore, SingTel, and other corporations were established by the government. But the model was strictly a commercial one. These entities were not founded to be government subsidized enterprises, but were founded for purposes of making a profit. If they did not, they were shut down. So the EDB provided seed money – often through the Development Bank of Singapore (DBS) which was then a part of EDB but later became an independent bank - but no long term subsidies. Eventually, many of these enterprises such as Singapore Airlines sold shares to the public and so became Government Linked Corporations (GLCs), but not wholly government owned corporations.

Eventually Temasek Holdings was created 1974 as an independent but government linked investment management firm to manage the government investments in these entities that EDB and DBS no longer
wished to manage directly. As a result of the great success of many of these companies over the years, Temasek now manages a portfolio of 129 billion (US$ 80 billion). The group has a board of 12 members of whom one is from the government. It is self-funding and earns 18 percent on equity with its investments being one third in Singapore, one third in the OECD area, and one third elsewhere in Asia and in emerging markets. Not to be confused with Temasek is the Government Investment Corporation of Singapore (GICS) created in 1981 as Singapore’s budget and trade surpluses were creating enormous reserves that needed to be professionally invested. Whereas Temasek invests heavily in equities, GICS favors U.S. Treasury bonds, real estate, and some equities.

**RIEC, NRF, ASTAR**

Although it has a great deal of independence, EDB is not autonomous. Overall guidance for the new innovation economy is developed in the Research, Innovation, and Enterprise Council (RIEC) which is chaired by the Prime Minister and includes all key Ministers as well as important academic and business leaders including non-Singaporean leaders of MNCs with operations in Singapore. The purpose of this body is to advise the government and set guidelines for Singapore’s research and development policies and strategies for transformation into a knowledge intensive, innovation economy.

Linked to this body is the newly formed National Research Foundation which is located in the Prime Minister’s office and acts as the secretariat for the RIEC. Its job is to coordinate and integrate the activities of the different research activities in order to provide a coherent strategic overview of R&D activities and strategies. It also has a budget of about $3 billion over the next three years and thus evaluates proposals and monitors project progress. About one third of R&D spending in Singapore is government funded and two thirds is privately funded, but the government has a significant impact on the whole. Closely related to the NRF is the Advanced Science and Technology Administration (ASTAR). Formerly known as the National Science and Technology Board, it is charged with raising the level of science and technology by fostering world class research in specific areas. It operates as a semi-independent agency of the Ministry of Trade and Industry and is responsible for implementing Singapore’s National Science and Technology Plan.
Singapore now spends about 2.3% of GDP on civilian R&D and another .5% on military R&D. The goal is to raise total R&D spending to 3% of GDP by 2010. It should be remembered, however, that Singapore also benefits enormously from the R&D spending of the MNCs who have put major operations in the city state. Thus, the effective R&D spending for Singapore is probably more like 4-5% of GDP.

**Housing Development Board (HDB)**

Before there was an EDB, there was an HDB. In 1965, housing in Singapore was crowded or non-existent. It was common for five families to share a house. Lack of adequate housing was one of the important factors driving unrest and ethnic tension at the time. Lee feared that citizens without an ownership stake in the society would not be politically stable nor would they feel a commitment to defend the society. He therefore made providing better housing and fostering home ownership top priorities from the beginning. The Housing Development Board was established to build low cost housing for workers. Laws were also passed allowing the government to buy land at about a third of its market value on the grounds that private land owners should not profit from the increase in value due to publicly funded investments and policies. In time, the government of Singapore came to own about 80% of the country’s land. In conjunction with HDB home building, the Central Provident Fund which had been started by the British as a simple retirement vehicle was expanded into a compulsory savings scheme that would enable every worker to own his own home. The contribution rate to the Fund was gradually raised from 5% of wages (matched by 5% from the employer) to 25% (also matched by the employer). With vast amounts of money going into the fund, it could be used not only for retirement but also to pay for a home down payment. Today, over 93% of Singaporeans own their homes and about 80 percent are HDB homes. Beyond this success, the HDB was also successful in that it served as the model for the later creation of the EDB.

![Percentage of Population Housed in HDB Flats](chart.png)

Society
Long a British colony and born as the result of bloody race riots, Singapore initially had little national identity. Although about three fourths of its population was ethnically Chinese, there were divisions of dialect and regional origin among them. Moreover, the remaining fourth of the population was of Malay and Indian extraction and was not at all integrated into the Chinese society. Indeed, the various ethnic groups lived in their own distinct sections of the city and even tended to work in distinctly separate occupations. To have any chance at creating their First World Oasis in Southeast Asia, Lee and his colleagues had to forge a national identity and social cohesion such that all Singaporeans would feel and act as if they were on the same team. Several policies were of key importance in achieving this.

The first was the decision to promote English as the common language of the Singapore community. This was Lee’s decision and he drove it through steadily but not by decree. In fact, by law Singapore had four official languages – Tamil, Mandarin, Malay, and English. But the key decision was to introduce the teaching of English in the Tamil, Mandarin, and Malay schools while also having the other languages taught in the English schools. Because English was the language of business, many parents began to favor sending their children to the English schools. This created a reaction in parts of the Chinese community which began a movement in the Chinese Chamber of Commerce to push Mandarin as the dominant language. This effort gained momentum when it was supported by some of the Chinese language press and universities. Lee faced them all down and continued gradually to shift most of the instruction in the universities to English. His main point was that there could not be ethnic and racial harmony if one of the ethnic languages was dominant. English was, in this sense, a neutral language and therefore acceptable to all. That it was also the language of globalization was an added plus, but not the main reason for adopting it.

The HDB was also a powerful integrator and forger of the new Singapore society. Legislation was adopted stipulating that all public housing developments should reflect the national ethnic balance of Singapore in their local population. Since Singapore was about 75 percent Chinese, 15 percent Malay, and 10 percent Indian, all public housing had to have similar proportions among its residents. Over time, this obliterated the ethnic ghettos and helped create a sense of national and societal identity.

Military service was another great leveling and integrating force. All Singapore men were required to do two years of military service, and this reinforced the need for English as the common language while serving to throw the ethnic groups together on completely common ground.

The final factor was the building of Singapore as a meritocratic society. Critics sometimes argue that Singapore puts too much faith in tests and bureaucracy and there may be some truth to the point. But making entrance to schools, government jobs, and other public institutions conditional only on merit rather than family or political connections has been an absolutely essential element in forging a society of which everyone feels a part. Today, Singapore has built a high level of religious and ethnic harmony. Its low criminality has not only resulted in a very small prison population but in a high level of personal safety. A high level of social cohesion prevails with a strong sense of Singaporean identity and, of course, a high level of prosperity and opportunity.

At the same time Singaporeans score only #23 on the Satisfaction with your Life index and there is undoubtedly a substantial degree of anxiety among children about less than perfect school grades. More concretely, inequality among Singaporeans as measured by the Gini index is relatively high compared to other countries in this benchmarking exercise. This index score has actually worsened in recent years after improving markedly for a long time. The reason has to do with the bursting of the Internet bubble in 2000 and the ensuing recession as well as with the affects of globalization and the entry into the world economy of the three billion new participants from China, India, and the former Soviet Union. Singapore’s lack of a welfare system, of course, means there is no mechanism to smooth out this phenomenon.
One way in which Singapore is being very creative is in its response to declining birth rates and aging of the population. On the one hand, the government has undertaken to play matchmaker and to encourage Singaporeans to marry and to have more children. On the other hand, it has also begun to promote immigration. Of course there has always been and will always be a large force of foreigners who work as maids and menial laborers. They are on temporary work permits and come and go as demand for labor requires. But in addition to these, the government is now actively promoting immigration of highly skilled people who will come to Singapore and take up residency and eventually citizenship. The objective here is to make Singapore something like the London or the New York of Southeast Asia in terms of attracting talent and youth. This in itself must count as quite entrepreneurial and creative.

Governance

Closely related to creating a meritocratic society is the removal of corruption. Corruption had been a bit of a problem in Singapore prior to 1959. When Lee and his colleagues took office then, they wore white shirts and slacks to symbolize their commitment to purity and honesty in the public service. The old colonial Corrupt Practices Investigation Bureau was strengthened and the anti-corruption law was broadened to make anything of value illegal as a gratuity. At the same time, the need for permits and approvals was dramatically reduced so as to remove discretionary procedures that could give rise to pay-offs in the first place. A major campaign was launched to go after the biggest offenders. Here the key to success was a new law that allowed the courts to treat proof that an accused was living beyond his means as evidence of having accepted bribes. With this law and the advantage of working out of the Prime Minister’s office, the head of the CPIB had great success. High profile cases against ministers implicated in corruption in the early decades made it clear that no one was beyond the reach of the anti-corruption police. Further, any civil servant convicted of corruption not only lost his or her government job and pension benefits, but also risked being unable to find a job in the private sector.

At the same time efforts were made to reduce the circumstances that tend to lead to corruption. Use of market pricing, publication of clear guidelines, and use of merit based procedures for recruitment and promotion all militate against corruption. In particular, elections in Asia are notoriously oiled by freely flowing money. For example, to be elected to Taiwan’s legislature some candidates have spent as much as $20 million and in Japan an ordinary legislator has a huge need for cash to send the expected birthday, wedding, and anniversary gifts to constituents. Singapore attacked this problem by making voting compulsory and prohibiting the practice of using cars to take voters to the polls. In other words, getting money out of politics made for clean government. As a result, Singapore is consistently rated among the least corrupt countries in the various competitiveness indexes.
Part of Singapore’s high quality of governance is a result of their high quality civil service. From the beginning Singapore has been noted for the high quality of its civil service. Entrance is, of course, by examination. Public service enjoys high status in Singapore and the government encourages good students to try to join the civil service, in part by awarding scholarships for foreign study to such students. Because civil servants can also ascend into the top ranks of the government and become leading ministers or heads of key business entities and, further, can actually effect change, there is a high sense of mission and esprit de corps. A final key element is remuneration. Singapore has always tried to pay its civil servants well, but in 1995 it adopted a law, originally suggested by Lee, that links civil servant pay to pay scales in private industry. As a result, top Singapore officials are as well paid as top CEOs and it is not uncommon for salaries to amount to $1 million or more annually. Thus it is not surprising that the Singapore government is staffed by the brightest and best who in other countries might be investment bankers, trial lawyers, or corporate CEOs. In addition to being of high quality, these bureaucrats also work extremely closely together. They serve with one another on the boards of the GLCs and the research and other institutes and form an integrated web that greatly facilitates coordination, planning, and implementation of policies and procedures.

The rule of law is the bedrock of the Singaporean system. Without equality before the law, the various ethnic groups could not have forged a common identity nor could the country have enjoyed the great economic success it achieved. Formally, rule of law consists of the enforceability of contracts, the effectiveness and predictability of the judiciary, and the incidence of crime. Singapore has one of the world’s lowest incidences of crime and contracts are definitely enforceable. The key is the judiciary. Singapore has worked very hard to establish quick and fair justice and has largely succeeded. In fact, its reputation is such that the World Bank holds it up as an example and international rankings put it ahead of the United States and the United Kingdom.
Singapore inherited its labor unions and their practices and attitudes from Great Britain and in addition they were dominated by communist leadership. Between 1947 and the early 1960s there were continuous strikes and labor actions. Between July 1961 and September 1962 alone there were 153 strikes. Moreover, the demands of labor were unrelated to the circumstances of the economy or the conditions of the enterprises. Labor laws and agreements had begun to warp real economic activity. For example, sanitation workers were paid triple time on holidays and so began to avoid picking up garbage weeks preceding holidays in order to collect the extra time. Ironically, Lee had made his reputation as a labor lawyer and was partly responsible for some of the egregious practices. That was then and this was now, however. By 1969 there were no work stoppages. How did that happen?

The key was a confrontation with the sanitation workers who called for a strike over the New Year holiday. Lee referred the matter to the Arbitration Board which automatically made any strike illegal during the arbitration period. It was a technicality, however, and the union went ahead with the strike. Lee had the union leaders arrested, the courts ruled that the workers had sacked themselves and would have to reapply for their jobs, and the union was deregistered. While the move was perhaps heavy-handed, it did set Singapore on the path to more efficient labor relations by eventually eliminating workdays lost to strikes.

In 1968, a series of legislative acts placed limits on retrenchment benefits, overtime bonuses, and fringe benefits. They also restored to management the right to hire and fire and to promote and transfer while also making it illegal for a union to take an industrial action without a secret ballot and banning strikes altogether in certain public service sectors. In 1972 the National Wages Council (NWC) was established with representatives from the National Trade Unions Council (NTUC), management, and the government to set wage guidelines annually on the basis of economic conditions. Essentially all agreed that wage increases
should not exceed productivity gains. In this context it should be noted that the Secretary General of the NTUC has long also been a government cabinet Minister and several Presidents of Singapore have been former labor officials or members of parliament who have been close to labor. In effect, Lee used his own former labor background to shape the Unions to become a force for competitiveness. In 1982 a major step was taken when the then NTUC secretary-general initiated the change from industrial to company (or “house”) unions. This shift was completed in 1984. To show how far things have come, it was the unions who volunteered a wage cut of 15 percent in the wake of the Asian financial crisis of 1997-98 in order to enable Singapore to regain competitiveness.

Singapore has no minimum wage and there is no formal unemployment benefit system. While there are some supports for workers in really dire straits, the system is essentially one of “no work, no pay.” Thus workers are encouraged to take lower paying jobs rather than wait if they happen to lose their normal employment. There are no job guarantees at the time of hiring and payments in the event of dismissal are limited. However, there is an extensive system of training and retraining programs and an elaborate program of skills identification and skills recognition. This approach eliminates major unemployment problems by closely monitoring the needs of the companies that function in Singapore and helping tailor the workforce to meet those needs. The result of this along with strong economic growth is an unemployment rate of about 2.7 percent and an unparalleled record of real wage increases over 40 years.

Health and Welfare

Singapore’s slogan is “A fair, not welfare, society.” There is no welfare as such. Destitute people may receive some assistance but only after strict means testing that includes family members and only on a very limited basis. Social security and welfare spending amounted to less than 1 percent of GDP between 1990 and 2001 compared to 13 percent for the typical OECD country. Such spending as exists is mostly in the form of incentives to work. Thus the government will top up the salaries of older low-income people who work at
least part of the year. The government also looks upon its housing, education, retraining, and healthcare programs as a type of welfare. In addition, taxes are relatively low and the government will pay dividends to all citizens when it profits from taking a GLC public or from other activities. So this is seen as a kind of repayment system that does not entail entitlements and built-in high costs.

The key to the whole system is the Central Provident Fund into which workers now (these rates move around from time to time) pay about 20 percent of their income to be matched by an employer contribution of 13 percent. These are compulsory contributions that also largely explain Singapore’s high savings rate. The system began as a retirement scheme, but, as we have seen, became also a housing scheme and later also formed the basis for covering costs of essential health care. As a retirement scheme it is, of course, a defined contribution system. The CPF pays 2.4 percent interest, but individuals are permitted to take some of the money above designated floor levels for private management if they so desire. To date such private management has not beaten the CPF returns. With an aging population, Singapore may face pressure on the fund in the future, but for now retirement payments seem to be comparable to other advanced countries.

The really interesting part is the health care aspect of the CPF. Singapore has an average life span longer than that of the United States (and Israel?) but spends about 4.5 percent of GDP on health care as opposed to the 12-14 percent of the United States and other OECD countries. To achieve this, Singapore puts a high priority on prevention of diseases such as HIV, malaria, AIDS, and tobacco related diseases. Government hospitals and clinics provide a very basic healthcare service subject to tight expenditure control. This care is 80 percent subsidized from the government budget. Major use of Information technology dramatically improves efficiency by giving doctors and hospitals instant access to all medical records while reducing the number of necessary clerical staff. Use of expensive tools and drugs is subject to an elaborate system of screens if it is at public expense. Public wards are subsidized by 80 percent, but if a patient wants more privacy he or she must pay for it. An optional low cost program is available to cover catastrophic illness and Medifund provides a minimal safety net for the truly needy. But personal and immediate family responsibility is the fundamental principle. Individuals pre-save through the CPF and may also buy private insurance. Only pre-approved treatments can be deducted from the CPF Medisave account and consultations with private doctors must be paid out of pocket in cash. The state mandates publication of private hospital tariffs to facilitate comparison shopping.

Education

In recent years, Singapore students have been prominent by scoring at the top in comparative international testing. Their performance is especially impressive in science and mathematics. This, however, was not always the case. In 1960 most Singaporeans had little or no education. Schooling was not compulsory and illiteracy was widespread. There was an acute shortage of teachers. One of the first steps of Lee’s self-government regime in 1960 was to found a teacher’s college and to begin a crash education program by scheduling double sessions so that school went from 7 a.m. till noon and then from 1 p.m. till 6:30 p.m. School rooms were crammed with 55 in a class. Between 1960 and 1965 enrollment doubled. The initial objective was to teach basic skills and large education and training grants and subsidies were made available. Indeed, the prospect of advancement through education was one of the major factors influencing organized labor to moderate its militancy.

Until the mid-1980s, the focus was very much on turning out the skilled technicians and artisans then in great demand in Singapore’s booming industrial economy. Efforts were made to avoid turning out unemployable white-collar graduates. Access to various types of education was by examination and strictly merit based. Students were tested often and channeled into areas according to their capabilities with
emphasis on engineering and accounting. Only about 10 percent of students went on to tertiary education at polytechnical schools and universities.

From 1985 onward, however, as attempts were made to broaden the economic base so also was there a push to broaden and heighten education. Today, over half of all students eventually go on to university or tertiary polytechnic training. The emphasis, however, is still very much on science and engineering with a majority of students enrolled in those disciplines. The education system continues to be closely integrated with industrial policy so that people have the skills being demanded by the direction of economic development.

The school system is run on a centralized basis with strict curriculum control. There is little variation in school quality from neighborhood to neighborhood and children are permitted to attend the school of their preference depending on their ability to pass the entrance exams. There are special magnet schools that train an elite university bound student body, but there are also opportunities for students in less elite schools to shift to the magnet schools and also to enter the universities based on examination.

Singapore math and science scores are exceptional internationally and Singapore Math has become a kind of international trade mark.

One result is that Singapore ranks third among nations in number of researchers in R&D per million people. Behind this lies the fact that Singapore students have more computers and math and science tools available to them both at school and at home than those in most other countries.

The increasingly critical role of education can be seen in an analysis of the sources of Singapore’s growth. In the years until 1980 it contributed only about .1 percentage points of the country’s 8.6 percentage points of annual growth. Since 1990, however, this has risen to .8 percentage points of the 6.2 points of annual growth or just under one sixth of the total.

At this moment, it is fair to say that Singapore ranks very near the top of all countries in the quality and breadth of its educational system and particularly in the fit between the needs of its economy and the skills of the work force. One criticism that has been made is that curriculum is too strictly defined and that the system focuses on rote learning and not enough on fostering creative thought. In response, since the late 1990s, the government has been revising the curriculum to emphasize problem solving and creative thinking and has also been sending students specifically to Silicon Valley to intern with Venture Capital firms and start-up companies.
Of particular significance is the way Singapore has handled education of its different ethnic groups. Chinese students have historically scored higher and finished more years of education than their Malay or Indian classmates. But the government has made a concerted effort to involve the families and communities and to make extra effort to improve the performance of the lagging groups and has achieved great success in doing so. So much so that, although they still lag their Chinese classmates, the Singaporean Indian and Malay students far outscore American and many European students on the international tests.

**Fiscal and Monetary Strategy**

Singapore aims to balance its budget annually, and, in fact, has had an annual budget surplus since the 1960s with the exception of the recession years of 1985-87. Since 1990, the surplus has averaged about 10.6 percent of GDP annually thereby providing a substantial portion of Singapore’s savings which is used to invest in infrastructure, housing, and human capital formation. The objective has been to finance both operating and development expenditures out of current revenue while remaining internationally competitive regarding tax structure. This approach has made public debt negligible and thus reduced government interest payments to virtually zero.

We have already seen that Singapore spends less than 1 percent of GDP on social security and welfare compared to 13 percent for the typical OECD country and only about 1.2 percent on healthcare as compared to the OECD average of about 6.4 percent. As a result, even though defense spending is a relatively high 5 percent of GDP, current government expenditure between 1990-2001 amounted to only 14 percent of GDP versus 35 percent in the median OECD country. Against this, total government revenue was about the same as the OECD average at 33 percent of GDP. What is really striking, however, is that revenue from taxes was only 16 percent of GDP as opposed to the OECD median of 31 percent. Singapore obtained revenue of 17 percent of GDP as non tax revenue from government enterprises, lease of land, road use fees, and interest and dividends on government investment. This, of course, was possible because constant budget surpluses have left Singapore with net assets of about 120 percent of GDP.

The really powerful thing is that Singapore has been able to generate this exceptionally strong financial position while dramatically lowering taxes. The top marginal rate on personal income has been lowered...
from 55 percent in 1965 to 20 percent today while the 40 percent corporate tax rate was also lowered to 20 percent with, as we have seen, much lower rates for certain designated cases. Some of this revenue loss has, of course, been compensated for by a 3 percent goods and services tax (kind of a VAT) and by the road user and other user fees. On the other hand there is no capital gains tax or estate tax, and the overall tax environment remains extremely attractive and competitive.

Monetary policy has been equally non-inflationary, with a 3 percent average inflation rate from 1964 to 2004. For most of its history the Monetary Authority of Singapore did not issue currency and operated under a currency board arrangement. In recent years it has begun to issue its own currency but policy has been extremely conservative and anti-inflationary. Of very great importance is exchange rate policy. Here, Singapore engages in currency management or a kind of dirty float both to stabilize its currency and to assure that the Singapore Dollar does not rise enough in value against the U.S. dollar to endanger Singapore’s export led growth strategy by making Singapore exports more costly.

Savings and Investment Strategy

Complementing the prudent fiscal and monetary strategy has been an equally prudent but also aggressive savings and investment strategy. Through a combination of fiscal policy and carefully structured incentives, Singapore raised its savings ratio from about 10 percent of GDP in 1965 to close to 50 percent of GDP today, one of the highest in the world About a quarter of that derives from the savings of the central government as a result of its fiscal policy and budget surplus. In addition, the GLCs and government statutory boards are run, as noted above, on a strictly for profit basis and their profit contribution raises savings by another 9 percent of GDP. Further, the contribution from the savings of private corporations comes to another 18 percent of GDP. Finally, a number of government policies such elimination of taxes on capital gains, interest, and dividends; refusal to provide very significant unemployment, health, and welfare payments, and mandatory contributions to the Central Provident Fund (CPF) were extremely important. In the case of the CPF, contributions (matched by employers) were raised gradually from 10 percent of wages to 50 percent. All of these measures led to a private savings rate equal to about 9 percent of GDP.
The high savings ratio and the strong push by the EDB to attract foreign investment allowed Singapore to pursue perhaps the most aggressive investment policy the world has ever seen. From less than 20 percent of GDP in 1965, investment was raised to 40 percent of GDP by 1970 and to about 50 percent in the 1980s. Enormous private investments were made in machinery, transport equipment, manufacturing plants, and petrochemical facilities. These were complemented by public sector investment in housing, the Port of Singapore, Changi airport, roads, mass transit, and telecommunications.

From 1965 until 1985, Singapore invested more than it saved and ran a current account deficit which it financed with foreign direct investment and loans from the World Bank and other agencies. Since 1985 it has run an increasing current account surplus. In the last five years investment has fallen off to the 20-25 percent of GDP level while savings has remained quite high. This, of course, has led to accumulation of very large current account surpluses which are now being invested abroad in such things as a technology park in Bangalore, hotels in Vietnam, port and telecommunications facilities in Belgium, and industrial parks in China. The government of Singapore also holds about $300 billion of U.S. Treasury Bonds.

Infrastructure
Singapore started with the advantage of having one of the world’s great ports that had been kept at a leading edge of technology and management by the British colonial authority. Since independence the Port of Singapore Authority has invested heavily in equipment, manpower, and technology to keep the Port of Singapore among the world leaders. Its container traffic of over 22 million twenty equivalent units (TEUs) ranks it with Hong Kong and Shenzhen at the top of the world’s port list. As already noted, it is so efficient that many shippers use it even when simple distance calculations would suggest alternative routings. All of Singapore’s ports are managed under one authority which in turn is highly coordinated with other bodies managing the other key elements of Singapore’s integrated infrastructure.

Similarly Changi airport is maintained as one of the world’s heaviest traveled, most efficient, and most user friendly airports. It handles over 20 million passengers per year and is the indispensable hub for air traffic in all of Southeast Asia. It provides free high speed internet connections to all business travelers, quick transfers, shower, massage, and overnight sleeping facilities within the terminal, and fast baggage service along with convenient, inexpensive, fast, and no haggle connections to the city by rail, bus, limo, and taxi.

Singapore’s road management system is legendary with the smoothest rush hour of any city on the planet and with much less air pollution generated by road traffic than any other major city. This is accomplished with a number of tools. Foremost is the Certificate of Entitlement which a driver must purchase at public auction in order to be able to drive his or her vehicle. In addition, high taxes on gasoline make driving very expensive. There is also an annual road tax that varies according to the size of the vehicle. Finally there is the Electronic Road Pricing (ERP) system. Overhead gantries scan and automatically deduct a toll from the cash card unit in each car on the roads. Charges vary according to time, place, and class of vehicle. In this way, those who contribute most to congestion pay the highest cost and congestion is dramatically reduced. At the same time, revenue collected from this exercise contributes nearly ten percent of the entire budget. These proceeds in turn fund large public-sector investments.

As a last note on road transport, the electronic and global positioning system for taxis should be mentioned. It makes Singapore’s taxi service probably the most efficient in the world.

Perhaps most significant is the sophistication of Singapore’s electronic and Internet infrastructure. It is rooted in efforts that began in the early 1980s. At this time, the government recognized the great potential of computers. It established the National Computer Board and gave it the mission of spreading the use of computers as widely as possible both in business offices and factories and in private homes. The Board was led by one of Lee’s top lieutenants, Dr. Tony Tan. The strategy was simple. The government first computerized its operations as a demonstration to both businesses and families of how it could be done. Ten ministries were chosen as the pioneers and $100 million was invested. There were no IT courses at the universities, and they were established at that time. In fact, Cabinet Ministers were among the first to take the new IT courses. In the 1990s similar efforts led to the widest possible deployment of optical fiber wiring to offices and homes and to deployment of high speed internet capability, making Singapore perhaps the most wired city in the world.

As an insight into how Singapore works it is interesting to look at the career or Ko Kheng Hwa, the Managing Director of the EDB. After studying engineering on a government scholarship in the U.K., he returned to work at the Ministry of Defense. Then a Sloan Fellowship took him to MIT where he studied business management. Upon returning to Singapore he joined the National Computer Board and has moved up since to become head of the EDB. This is a typical kind of career and background for a high ranking Singapore bureaucrat. Thus, it is not surprising that Singapore scores near the top in the competitiveness of its physical infrastructure.
Additionally, Singapore's growth has been environmentally sustainable. So much so that it has been labeled “Asia’s Garden City.” Indicators of water pollution are among the best in the world, and it has avoided the air pollution that plagues Hong Kong and most other cities of developing Asia. This has been achieved only with great effort. In the 1960s, it was common to find cattle in the city center, and the waste of pigs turned the rivers into stinking sewers. At the same time, Singapore was totally dependent for water on rivers controlled by a sometimes unfriendly Malaysia. Through massive engineering works, development of extensive facilities for catching rainwater, and dedicated effort over many years, Singapore has turned the putrid swamps into gardens and managed to become less dependent on outside water supplies.

**Entrepreneurial Strategy**

If there is a deficiency in the Singapore arsenal it is in the area of venture capital, start-ups, and entrepreneurial activity. As noted earlier, the business class of Singapore at its foundation was made up largely of traders rather than the entrepreneurs who had migrated from Shanghai to Hong Kong. In lieu of home grown entrepreneurs, Singapore concentrated on a strategy of importing advanced manufacturing and technology via MNC investment and becoming essentially a manufacturing export platform for such MNCs. The Singapore education system was structured to turn out well trained technicians and managers, but did not encourage the independent thinking and creativity that is essential to entrepreneurial activity.

In the early “catch-up” years of Singapore’s development that did not matter very much. But as Singapore has become a fully developed country operating at the cutting edge of business and technology, the need for creativity, entrepreneurial imagination, and start-up activity has become more pressing. Characteristically, the government has responded with an array of programs aimed at spurring creativity and venture activity. One with symbolic as well as substantive significance is the Challenger Award under which the government undertakes to fund new business and venture projects dreamed up by civil servants. The Technopreneurship program of the 1990s to encourage entrepreneurship stumbled with the bursting of the Internet bubble as many Singapore start-up firms disappeared. But Singapore has responded by revising school curricula to foster more creative thinking and by creating more incubators and making funding available for venture capital. There are now 160 venture capital groups active in Singapore with $10 billion available for investment. In addition, the government is providing extensive support to local small and medium sized businesses through the SPRING (Singapore Productivity Innovation Growth) program that provides loans, export insurance, and other benefits to SMEs. Finally, coordination between the programs of the universities, the government research institutes, private corporations, venture capital groups, and the EDB is extensive and intimate.

A high level commission has created a vision of the future Singapore as a city developing niches of excellence in a wide variety of areas including tourism, advanced engineering, software design and development, healthcare, tertiary education, financial services, biomedical sciences (Singapore has become a major center of stem cell research), digital and interactive media, and water management technologies.

While it is unlikely that Singapore will suddenly blossom as the next Silicon Valley, its ability to adjust and adapt should never be underestimated. There is good reason to believe that the city-state will continue to find ways to maintain its vitality and growth.

**Lessons for Israel**
In our view, Singapore is one of the most successful countries of the past forty years in terms of sheer growth and development. Singapore’s government has a single-minded dedication to engineering a competitive, first-world oasis in Southeast Asia. The top priority of Singapore’s leaders over the past forty years has been to make Singapore competitive. This has meant using a variety of policies and incentives and exhortations in a tightly integrated and coordinated way to bring every possible measure to bear in achieving the goal of competitiveness. We find that studying three of these specific policy areas will be most beneficial for Israel.

First, Singapore has an incredibly high quality of governance. Numerous precautions have been established to eliminate corruption and create a spare and easy to navigate bureaucracy. The smartest and best Singaporean students are recruited to the public sector—they are paid very well but are also subject to extremely strict measures if caught in any indiscretion. Permits and licenses have been eliminated on many levels, also eliminating methods for government employees to extort bureaucratic processes for profit. This level of governmental transparency and quality makes Singapore an extremely attractive investment arena.

Second, the Economic Development Board has been crucial in Singapore’s successful development. The EDB has autonomous authority to attract outside investment and lure MNCs to establish operations in Singapore. The scope of the EDB’s power ranges from ability to offer tax holidays and land grants to arranging infrastructure and worker retraining programs that benefit incoming corporations. Further, the EDB’s overarching plan for Singapore has been methodically followed for almost 40 years. This sort of long-term focus on a specific development plan is obviously extremely successful in this case. Replicating a similar organization in Israel could help streamline the country’s development, in a way that the Chief Scientist’s office is unable to do, with its ability to manipulate multiple areas of the investment environment.

Finally, the quality of Singapore’s infrastructure is absolutely top-notch. It would be very difficult for the EDB to attract the kinds of high-tech, knowledge intensive industry they want to attract if their infrastructure was subpar. Investing in the best electrical and internet grids, easy to navigate roads and high quality transportation helps assure that the best corporations with the highest value added products relocate to Singapore.
Although modern Taiwan is a relatively small state with an ambiguous status as a sovereign nation, it punches well above its weight in international economic affairs. Although denied representation at the UN and other international organizations because of the conflict with mainland China, Taiwan sits at the center of a web of international supply chains, and Taiwanese businesses are both major exporters and investors. This international orientation has long been at the core of Taiwan’s economic development strategy – which has succeeded in transforming an impoverished island with a predominantly agricultural economy into a developed country with world class companies producing leading edge of technologies in just two generations.

Few countries have managed to take advantage of the opportunities afforded by globalization and technological innovation as rapidly as Taiwan has. While Taiwan’s development strategy shared many similarities with its ‘Asian Tiger’ counterparts in Hong Kong, Singapore and South Korea, in many ways, its experience holds the most relevance for Israeli policy makers: Taiwan has modernized in the face of a consistent and daunting security threat; it has combined state led industrial policies with a freewheeling entrepreneurial culture that has created lots of successful small and medium sized companies; and it has fostered and promoted the development of indigenous technologies and human capital that have enabled the country to become a hotspot of innovation and high-tech industry.

**Historical Background**

From the beginning, Taiwan’s identity has been shaped by international trade and investment. Taiwan’s original inhabitants were Malay-Polynesian, and for most of its early history the island remained cut off from the centers of power and civilization in East Asia. Occasional visits by pirates and traders from China and Japan were Taiwan’s main source of contact with the outside world until the Dutch established a trading post on the southern coast of Taiwan in 1624. At first, the Dutch and later the Spanish used Taiwan as a trading entrepot for their merchant activities across Asia, but soon began encouraging the migration of Han Chinese to the island to cultivate rice, tea and sugar for export to China and Japan.

In 1662, the Dutch were expelled from Taiwan by a Chinese army and the island spent the next two hundred years as a province of imperial China. During this time, international trade was discouraged and the island’s economy stagnated. When Japan gained control of Taiwan in 1895, they set about developing the island as a source of agricultural goods for the Japanese home market. In 1905, the Japanese instituted a limited land reform, a first step in Taiwan’s transition from a feudal society into a modern economy, and the colonial administration made significant investments in Taiwan’s infrastructure, particularly roads, irrigation and electricity generation, in order to facilitate the development sugar and rice production for export. They
also improved the institutional infrastructure, promoting primary education, organizing farmers associations and agricultural research institutes to spread new farming techniques and boost crop yields.

By the second half of the 1930s, as Japanese military expansion put strains on the domestic economy, the first efforts at industrializing Taiwan were begun. In order to support the Japanese war efforts, many defense related industries were established on the island, including aluminum and steel, machinery, weapons and chemicals. The Taiwanese also developed various light industries producing for domestic consumption after wartime disruptions prevented the import of many manufactured goods from Japan. Thus, prior to the post-war takeoff of the economy, Taiwan had already laid much of the groundwork for expansion.

After Mao’s communist forces expelled the Kuomintang from mainland China in 1949, a wave of over two million refugees descended on Taiwan. These refugees included many merchants and traders, as well as much of the elite of pre-war Chinese society. These people brought with them a lot of human capital – the technical skills and know-how that would prove so crucial to Taiwan’s later economic development. By the early 1950s, over 60% of Taiwan’s population was literate, and the security threat emanating from the mainland helped to promote a sense of shared sacrifice and community that smoothed over the divisions between the ‘indigenous’ Taiwanese and the refugees from the mainland.

That said, control of the state was firmly in the hands of the Kuomintang party in general and Chiang Kai-shek in particular, who ruled under a decree of martial law until 1987. But while Taiwan was under authoritarian rule and political dissent was not tolerated, from an economic perspective, the government encouraged entrepreneurial activity and made efforts to ensure an equitable distribution of wealth. The focus on economic development was also a question of survival, however. In 1950, the economic situation was dire. Per capita GDP was about $108, over half the people worked on farms, inflation was running at a rate of over 600 percent, the balance of trade was in huge deficit, foreign exchange reserves were non-existent, and the whole economy was heavily dependent on U.S. aid contributions that amounted to nearly 10% of GDP. It was clear that if Taiwan was to survive the strategic challenge from mainland China, the economy would have to be revived.

One of the most important economic reforms enacted by the government was a land reform in 1949-1953 that redistributed land in favor of lower income groups and tenant farmers who had previously labored for feudal landlords. The fact that the government was controlled by émigrés from the mainland with no ties to the indigenous landholding elites was an important factor in the success of the land reform, but so too was the ingenious method by which the state carried it out. Instead of simply expropriating the land and handing it over to the peasants, the state gave the previous landlords equity stakes in the existing Taiwanese industries that had been inherited from the Japanese colonial era. At a stroke, the state transformed feudal landowners into industrialists and peasants into entrepreneurs.

Land reform was followed by efforts to expand rural access to credit and technology, as well as a concerted state led effort to rapidly industrialize. Land reform proved crucial to mobilizing the rural agricultural sector, which provided the major source of savings and investment capital that funded the industrialization of the island in later years. By 1951 production was back to pre-war levels and by 1952-53 inflation had been brought under control and the situation stabilized. From these unlikely beginnings Taiwan recorded the world’s second fastest economic growth from 1952-2005 with an annual average real rate of increase of 7%, just behind Singapore’s 7.5%.

Taiwan has gone through three major phases in its economic development. The first, the import substitution phase, was relatively mild and short lived by the standards of other developing economies and soon gave way to an export led growth stage that saw explosive growth.
Industrial Policies and Strategic Planning

The first phase of Taiwanese economic development began with the introduction of the first four year development plan in 1953. Along with the land reform program, an import substitution program aimed to balance the yawning trade deficit. Tariffs were raised on imports of most goods while special assistance was given to help establish the textile, shoe, and other light manufacturing industries that were relatively labor intensive. The approach was straightforwardly interventionist. The government identified promising investment opportunities and invited particular businessmen to participate - arranging low-interest loans and foreign aid funds for those who accepted the invitation. Textiles were especially favored with the government itself supplying cotton and materials to the factories and then buying all of the output. All the firm had to do was run the factory.

The structure of Taiwanese industry was composed of two tiers - several large state owned or formerly state owned companies dominated certain industries like cement or power, but many small, family owned contractors and sub-contractors made up a second tier that often supplied the giants. As the textile industry developed, many of these companies became contract producers for U.S. and other foreign companies that marketed under famous brands.

The institutional mechanism for devising and implementing Taiwan’s development strategy was the Economic Stabilization Board. This agency evolved into the Council for U.S. Aid to guide the allocation of American aid funds, and eventually became today’s Council on Economic Planning and Development which includes all the key government Ministers and has an elite staff and sizable budget of its own. In conjunction with the Industrial Development Bureau of the Ministry of Economic Affairs (which has the power to make grants and award tax incentives), it can be thought of as Taiwan’s version of Singapore’s Economic Development Board.

The second phase came in the 1960s. While Taiwan’s land reform had laid the groundwork for a modern capitalist economy, the Taiwanese were not satisfied with the results of the import substitution program and decided to shift to an export led growth approach. The NT$ was devalued by nearly half to make Taiwanese exports competitive on world markets and a series of tax rebates on imported raw materials and components and low interest loans for export sectors were introduced. In addition, the first Export Processing Zones - essentially industrial parks where red tape requirements were centralized and lightened and tax treatment was especially favorable – were established. These zones proved to be so successful that
they led to the gradual extension of similar incentives beyond their boundaries so that eventually the whole island of Taiwan became one big export processing zone that attracted large amounts of foreign investment. FDI and domestic investment were further stimulated by the Statute for Encouraging Investment in 1960. This program provided a range of tax holidays, tax ceilings, tax deductions, special depreciation rules, and other financial incentives to encourage investment in selected industries.

Throughout the 1960s, Taiwan remained a sort of hybrid economy. The ‘commanding heights of the economy,’ like the energy, steel and military-industrial sectors, were largely state owned and benefited from heavy state intervention. The government decided that it wanted to develop domestic steel, chemical and shipbuilding industries, for example, and so it set up state owned firms in these sectors. The banking system was viewed as a means of directing lending to favored industries, and the ‘invisible hand of the CEPD’ guided industrial policy, picking winners and losers. But at the same time, many small to medium sized enterprises were popping up as sub-contractors to the big state owned firms or were carving out new niches in the textile, electronics, and footwear sectors. These SMEs ensured that economic power and authority was not overly concentrated in the hands of the state and produced the most egalitarian income distribution of any of the Asian Tiger economies. SMEs were also the backbone of export-oriented development, transforming the structure of the Taiwanese economy from a largely agricultural base to an industrialized economy with a strong export manufacturing sector.

Taiwan explosive growth continued during the 1970s. Policy makers increased their efforts to promote heavy and intermediate goods industries such as steel, petrochemicals, and shipbuilding and move up the value added ladder to more productive and profitable sectors. Taiwan also underwent a major upgrading of its infrastructure. Large sums were spent on building new ports, airports, and highways, and linking the major population zones on the west side of the island. At the same time, the government also established the Industrial Technology and Research Institute (ITRI) and the Electronic Research and Service Organization (ERSO) to boost the technical skills of Taiwanese industry and promote domestic spending on research and development.

An interesting contrast between Taiwan and the economic development strategy of Singapore was that, while Taiwan welcomed foreign investment and gave it various financial incentives, the Taiwanese authorities (unlike the Singaporeans) did not give MNCs any benefits not available to domestic firms, and did not pursue foreign MNCs with the intensity of Singapore. Rather, the government put great emphasis on establishing Taiwanese firms and Taiwanese expertise and technology.

By the early 1980s, Taiwan’s exports were booming and the country was piling up enormous current account surpluses as a result of its strong incentives for savings, its undervalued currency, and its heavy emphasis on export oriented investment. But the oil crises of the 1970s had raised production costs in traditional industries as had the rising wages that inevitably accompanied the rising productivity of Taiwan’s workforce. Now the huge trade surpluses gave rise to charges of unfair trade and to pressure for a revaluation of the NT dollar which was eventually allowed to slowly appreciate. All this reduced Taiwan’s competitiveness and led to the development of a new strategic plan, ushering in the third phase of Taiwanese economic development.

In order to boost its international competitiveness, Taiwan began to lessen its reliance on state planning and control and shifted its attention from traditional heavy industry towards science and technology sectors. In this fourth stage of its economic development, Taiwan introduced a series of liberal reforms, freeing interest rates and introducing other market based incentives in the financial sector, and beginning a process of privatization that reduced state holdings in major companies. But Taiwan did not abandon government intervention in the economy.
The government’s Science and Technology Development Program led to the foundation of the Institute for Information Industry and the Hsinchu Science Industrial Park in 1981. The Science Park was modeled in part on the former export processing zones – except that it was focused on helping and providing financial incentives to technology companies specifically. It quickly became a magnet for high tech companies from around the world. Both the Institute and the Science Park played crucial roles in the development of Taiwan Semiconductor Manufacturing Corporation, and in the evolution of Taiwan into the world’s largest producer of semiconductors.

Taiwan in the 1980s was well placed to benefit from advances in information technology and communication. Previous investments in the educational system and in human capital more broadly meant that a large cohort of young people with high degrees of technical training was preparing to enter the work force. Thus, Taiwan had an abundance of young, well trained, and relatively inexpensive engineers at a moment when technology industries were globalizing rapidly.

Taiwan was also attractive to investors because its corporate tax rate of 25 percent was favorable, its policy environment was stable and predictable, corruption was not a big problem, the exchange rate was kept undervalued to keep Taiwan’s exports competitive, there were a large number of small and medium sized companies with solid engineering talent to act as contractors and sub-contractors, and infrastructure (especially ports and airports) was relatively good. But the role of the state in providing crucial funding and support for the nascent semiconductor industry should not be underestimated.

**Taiwan Semiconductor Manufacturing Corporation**

TSMC is one of the great industrial success stories of the past twenty years. Its tale provides a microcosm of the Taiwanese experience – interweaving strands of entrepreneurialism, innovative business practices, excellence in engineering, and state led industrial policy resulting in a world-beating corporation that is now the second or third largest manufacturer of semiconductors in the world.

The tale begins with a meeting of Taiwanese bureaucrats and an ex-pat Taiwanese engineer working for IBM in the early 1980’s. The engineer happened to mention that he thought the semiconductor industry was poised for rapid growth. He had seen the glimmers of the personal computing revolution at IBM and knew that a large expansion in semiconductor manufacturing capacity would be needed to underpin the growth of the consumer market for PCs. The Taiwanese bureaucrats thought this sounded like a good opportunity, and ran it up the flagpole to the Chairman of Taiwan’s Science and Technology Development Council, K.T. Li. Li was soon sold on the idea and enlisted the state-funded Industrial Technology Research Institute (ITRI) to support the development of a domestic semiconductor sector in Taiwan. As early as 1975, ITRI had set up a production line using technology licensed from RCA. But by 1985, the line was still running this same technology, which by now was three generations out of date.

As luck would have it, at this time another ex-pat Taiwanese engineer named Morris Chang had just retired from his position as President of General Instrument Corporation in the U.S. and was looking for something to do. He was soon recruited to lead ITRI by K.T. Li and charged with creating a plan for developing Taiwan’s semiconductor industry. This was a daunting task. Taiwan didn’t seem like it had many competitive advantages in the semiconductor industry. Its limited experience in the sector depended on out of date technology and it had no sales, marketing or managerial experience in semiconductors. But Morris Chang did. He had spent 35 years in the industry – first at Texas Instruments, and then later as head of General Instrument. And he soon hit upon a plan that would transform the global semiconductor industry and establish Taiwan as a semiconductor manufacturing powerhouse.
By the mid 1980s, with the costs of building new semiconductor fabrication plants rising exponentially with each new generation of technology, the number of firms with the available capital to fund new production capacity was dwindling. U.S and Japanese companies dominated the industry, but only large, established firms with access to the capital markets (or in the case of Japan, close relationships with Keiretsu banks) could find the funding necessary to keep building ever more expensive fabs. But the commercial applications for new types of semiconductors was continuously expanding, as new types of integrated circuits and chips were required to power new electronic devices like computers, mobile phones and other electronic equipment. So even as the industry appeared to be consolidating, there were scores of talented engineers working for small technology companies who were itching to get new semiconductor designs produced, but lacked the capital to build manufacturing facilities.

It was here that Chang saw an opening. Instead of competing head to head with the established players in the industry, Chang would create a semiconductor foundry. In other words, Chang’s foundry would not first design a chip and then construct a fab to manufacture it, but instead would build a fab to manufacture chips on a contract basis for outside firms that would manage the design, marketing and sales of the chips on their own. This strategy played to the strengths of Taiwan, which had lots of skilled and hard-working young engineers with manufacturing know-how, but no sales or marketing expertise and no access to the latest technologies.

In retrospect, it is clear that this was a brilliant idea, but at the time Chang still had a lot of convincing to do. Although he had state support from the government of Taiwan, no private Taiwanese investor was willing to back his venture at the time. So Chang launched TSMC with $110 million worth of funding from ITRI and a mandate to go out and find the rest of his start up capital from private sources. It was clear that TSMC needed a multinational corporation to partner with, so Chang set about contacting all the existing firms in the sector. Nine months later in 1987, he had convinced Philips Electronics to come on board and provide some of the capital and technology TSMC needed to get started.

At first, TSMC’s only customers were Intel, Motorola and Texas Instruments, who used TSMC’s fabs only when they ran out of capacity at their own facilities. But Chang had foreseen, and his business model allowed for, the rise of the fabless semiconductor company. By the early 1990s, scores of new firms that designed, marketed and sold, but did not manufacture, chips had been established, and they worked closely with TSMC to get their designs produced. As TSMC established partnerships with these firms, they gained more and more expertise, and by the end of the decade their manufacturing process technologies had caught up to or surpassed the industry leaders in the U.S. and Japan. Moreover, with so much demand for their services (TSMC was reportedly making net margins of 25-30% at the time), TSMC could funds its expansion through cash flow, and did not need to go back to the state for more subsidized capital.

The success of TSMC proved to be a boon not just for the employees and investors in TSMC, but for the economy of Taiwan as a whole. Many new competitors and supplier firms were spun off from TSMC, so that by 2007, no less than 51 semiconductor fabs had been built in Taiwan, with another 15 on the drawing boards. Taiwanese technology firms expanded into related fields like laptop computer assembly and flat panel display production, and a high-technology revolution moved the whole economy up the value added ladder.
Current Strategy

While it was gaining this strong position in high tech manufacturing, however, Taiwan was also achieving an important transition to becoming a more services and knowledge oriented economy. This had been indicated in a number of plans and programs including the Six Year National Development Plan of 1991, the Plan for National Development into the Next Century of 1997, the Plan for a Knowledge-based Economy of 2000, and the Global Logistics Plan of 2000 that all aimed to make Taiwan into a Green Silicon Island. The results were that while manufacturing, led by heavy manufacturing, was nearly 40 percent of GDP and services about 47 percent in 1985, by 2005, manufacturing had declined to 21 percent of GDP and Services had climbed to nearly 74 percent. Yet, all the while, Taiwan companies retained leadership in older industries by integrating new technology and developing services around the logistics, design, and management for production facilities now located abroad.

This focus on supply chain management and the efficient operation of manufacturing enterprises had served Taiwan well as it transitions away from low-skilled manufacturing work. A good example is the footwear industry. In 1983, Taiwan was the world’s top producer of shoes. By 2005, most of this production had moved to mainland China, Indonesia, and other cheap labor locations. Yet it is largely Taiwanese companies
who manage these factories and the run the logistics operations that integrate these factories into global supply chains. Take the Nike plant outside Shanghai for example. The factory is owned by Nike, but is managed under contract by the Taiwanese Feng Tai group. The plant manager is Taiwanese along with several other key executives and the logistics of shipping in materials and equipment and exporting finished shoes all over the world are handled by Feng Tai. The shoes are designed by Nike in Beaverton, Oregon, but are first produced and tested on the Feng Tai pilot line in Taiwan. So even though rising labor costs have cost Taiwan its role as the world’s shoe workshop, Feng Tai and other Taiwanese footwear companies have managed to maintain an important and profitable role in the industry by managing the global supply chains of footwear production even as the factories themselves have been outsourced to countries with cheap labor. This is a prime example of using management know-how and technology to enhance and prolong the life of traditional industries.

Of course, Taiwan’s proximity to China and its strong linguistic and cultural links with the mainland have given the island a comparative advantage in managing outsourcing to the mainland and operating factories and facilities there. Just as revaluation of the NT dollar forced a shift in the island’s industrial structure, so too did it contribute to the government’s decision to liberalize investment rules. Today, Taiwan businesses are by far the biggest “foreign” investors in China with over US$100 billion invested.

As it entered the 21st century in the year 2000, Taiwan launched the next Stage with its Plan for National Development in the New Century. It noted the challenges the economy will face from ever faster technological innovation, the magnetic attraction of mainland China, much more intense global competition from India and other new players, outsourcing and a service industry revolution, and global climate change that demands a green production chain and sustainable development. The report also noted internal challenges arising from the aging of the population and inefficient government. To respond, the plan begins with a vision of a “green silicon island” that will build a new “Taiwan Dream” based on “openness, innovation, compassion, inclusiveness, and harmony with nature.” The Taiwan that will emerge will have “a creative mind, a just heart, a bold maritime spirit, a vigorous circulatory system, and a sustainable lifestyle.”

Concretely, this means that Taiwan is emphasizing innovation as the prime mover of economic growth and is focusing on moving from “contract manufacturing” to becoming a “fount of creativity.” In particular it aims to raise the technical progress contribution to GDP growth from the current 33.4% to 52% by 2015. It also means reducing income, digital, and knowledge gaps among the population; making Taiwan the foremost e – economy in Asia by extending broadband internet connections to six million households; making no central city more than two hours away from any other central city and assuring an airport within
one hour of most of the population; and dramatically reducing air, water, and sound pollution while expanding reforestation and wildlife protection areas, and increasing water recycling and total sewage treatment.

Some of the key targets for 2015 are:

- Make Taiwan a unitary “living circle” in which no place is more than a day trip away.
- Keep increases in the CPI to no more than 2% annually.
- Raise per capita GDP to US$30,000.
- Keep unemployment below 4%
- Maintain economic growth at 5% annually
- Reduce the gap between the top and bottom quintiles of the income distribution to a ratio of below 6.

This is to be accomplished through the New Ten Projects that have as their major goals:

- To develop at least 15 products or technologies that rank among the world’s best
- To double the number of foreign tourists visiting Taiwan
- To increase R&D expenditures to 3% of GDP
- To expand the number of broadband Internet users to over 6 million
- To create 700,000 jobs.

To achieve these targets, the plan envisions major investment of over $75 billion in ten major areas as follows:

- Cultivate talent for the e-generation
- Develop cultural and creative industries
- Develop an international base for R&D and innovation
- Tourism
- Digitalization of Taiwan
- Develop Taiwan as an operations headquarters
- Improve the transportation infrastructure
- Conserve Water resources and the ecology
- Construct new hometown communities

Beyond this there are also a number of other major initiatives. One is the so called Free Ports plan which would make all of Taiwan’s ports (including airports) combination ports and processing – warehousing – transshipping – service centers with duty free and bonded zone status. The idea is to take advantage of Taiwan’s combined expertise in air and sea transport, information technology, cross-strait division of labor (with mainland China), and global logistics management. Another key plan is that for the targeted development of service industries, including financial services, and making Taiwan a Regional Financial Services Hub, telecommunications and media services, medical and care-giving services, design services, R&D services, and engineering consulting services.

At the same time, however, manufacturing and industry is not being neglected. A big part of the overall plan is to combine the efforts of the government and the private sector to promote the “Two-Trillion and Twin Star Industries.” The two trillion refers to the semiconductor and flat panel display industries each of which will soon exceed NT$ 1 trillion in production value. The plan calls for assuring their continued health and
growth by increasing the number of components manufactured domestically, eliminating investment barriers, and promoting industrial R&D alliances for developing key technologies. The Twin Star Industries are digital content and biotechnology which are thought to be the emerging stars of the future. The plan is to make Taiwan the manufacturing center of digital content in the Asia-Pacific region by subsidizing development of high quality products and equipment and to bring in substantial new investment into biotech while building up clusters for biotech through new biotech parks.

Institutions

When he arrived in Taiwan in 1948, General Chiang Kai Shek established an authoritarian government based on one party rule and military backing. He ruled under martial law from 1949 until he passed from the scene in 1975. His son, Chiang Ching-kuo, then took over and ruled until his own death in 1988. One of his last acts was to repeal martial law in the summer of 1987. Though far from democratic, this system did provide an enormously stable and predictable policy environment that minimized business risk and provided strong incentives for investors.

There was not a firm legal underpinning or a rule of law with a politically independent judiciary, but because the institutions were stable, predictable, and well known, procedures became quite standardized and recognized as reasonably fair and just. In addition, the civil service has been and remains of reasonably high quality. It is not the absolute top of the class as in Singapore, but government service has been and continues to be viewed as a prestigious career. Taiwanese civil servants are not paid like those in Singapore, but the compensation is acceptable and there are good benefits. For example, civil servants are guaranteed an 18 percent rate of return on their savings. In addition, many retire at a relatively early age into government owned or linked companies where they are well paid and receive additional pensions and benefits.

![Rule of Law - 2005](image)

*Source: "Governance Matters V: Governance Indicators for 1996-2005" by Daniel Kaufmann, Aart*
Given the high degree of government regulation and historically low degree of transparency, corruption has inevitably been a problem, but not a huge problem. The bureaucracy has been and continues to be relatively clean, and corruption does not impose the high cost that it exacts in many developing countries.

As noted above, the main drivers of economic strategy and policy have been the CEPD and the Industrial Development Bureau of the Ministry of Economic Affairs. Indeed, some (in a play on Adam Smith and his “invisible hand of the market”) have called CEPD the invisible hand of Taiwan. Its Chairman is a cabinet level official and its members include the Ministers of key government departments such as finance, communications, transportation, economic affairs, and so forth. In addition it has an elite staff of about 300 that is constantly analyzing the economy and looking for industries or industry niches to support. For this purpose it has a substantial budget of its own plus the power of approving major projects across the economy. For example, at this moment the focus of CEPD’s attention include Wi-Max, digital home appliances, digital auto parts, solar power and panels, bio-tech, and, of course, the whole ICT industry.

Linked with CEPD in this process are a myriad of key agencies and committees that also link to the universities, corporations, labor unions, and media. The most important of these is the Industrial Development Bureau of the Ministry of Economic Affairs which does the heavy lifting in terms of industry sector analysis and financial support of industrial and science parks and provision of incentives for targeted industries. Other key players include the National Science Council which controls the National Science Development Fund, the Industrial Technology Research Institute, the Committee for R&D on Applied Technology, and Academia Sinica (the main academic planning body). All of these bodies are tied together by interlocking membership and frequent consultation. In addition, there is close and constant consultation with industry leaders and part of the attraction of the science parks is that they are tied to university research and engineering activities so that partnership in science parks ensures access to the university work as well.

An important recent development has been the democratization of Taiwan that began in 1986-87 with the lifting of martial law and the formation of the Democratic Progressive Party (DPP) as a genuine opposition party to the ruling Kuomintang (KMT). This was followed by the holding of genuinely competitive elections.
for the mayors of key cities and then for members of the National Assembly. In 1996, this process culminated in the direct election of the President and in 2000 Chen Shui-bian became the first non-KMT President of Taiwan.

This move to democracy has created greater transparency and popular participation, but has also created some difficulties from the perspective of economic development. For one thing, it has brought a political spoils system like that of the United States to Taiwan. When the new party took power, it dismissed many of the top civil servants and replaced them with politically reliable but less experienced and knowledgeable appointees. For another, popular participation in government has meant that the major planning agencies and Ministries have been less able to push their programs through than in the old days.

On a positive note, democratization has led to substantial expansion of unemployment, welfare, and social security programs as well as to a strengthening of the role of labor unions that have the potential to greatly improve the quality of life for ordinary Taiwanese. Taiwan ranks quite high on the World Bank scale of Government Effectiveness, placing well ahead of Israel and a bit ahead of Estonia with a score of about .8. It also ranks quite well in terms of political stability, quality of regulation, and rule of law, and voice and accountability.

**Society and Language**

Taiwan does not have the ethnic divisions of Singapore, but there has long been a division between the people who were living on Taiwan before 1948 and the so called mainlanders who fled to Taiwan with the Chaing Kai Shek government after the communist takeover of the mainland. This division has diminished with time since the young people are all born on Taiwan. While Mandarin is the official language, many speak Taiwanese, but most are bi-lingual between the two. There has never been anything in Taiwan like the language differences of Singapore. Nevertheless, English is widely taught and spoken as the language of international business and the present emphasis of government policy is to maximize English speaking ability as a matter of high priority for national competitiveness. Another indication of the strong social cohesion of Taiwanese society is the fact that throughout the past fifty years of rapid economic growth, the fruits of that growth have been more widely and evenly shared than in most other societies as evidenced by Taiwan’s Gini scores (although recently the trend is toward higher levels of inequality).
Military service of about a year and a half is compulsory for all Taiwanese men, and this is a great integrating mechanism requiring commonality of language and common living and working conditions.

While ethnic and language divisions are relatively small and Taiwanese generally think of themselves as being on the same team, there are big political divisions between those – Blues - who favor closer relations and ties with mainland China and those – Greens - who favor declaring Taiwan an independent country. This division has become more pronounced as Taiwan has become democratic and also as mainland China has become a powerful and magnetic economic player. Indeed, one of the paradoxes of Taiwan is that even as it is the single largest source of foreign direct investment on mainland China, and Taiwanese business people flock to the mainland to run factories and make their fortunes, the country’s political leadership is wary of the ever closer economic ties – fearing that Taiwan will become too closely integrated with the mainland and lose the negotiating leverage it needs to maintain political autonomy. The result has been increased tension not only between Taiwan and the mainland but within Taiwan, and this could become much more serious in the future. On top of this, there is some question as to the identity of the Taiwanese team. Although official doctrine holds that there is “one China”, only 20 percent of people identify themselves as primarily Chinese, while 60 percent consider themselves Taiwanese and another 20 percent say they are both. “Whither Taiwan” is thus the central political and economic question facing the country, and the country’s continued success depends on finding a peaceful solution to this problem.

Military and Strategic Issues

Since its administrative separation from mainland China in 1948-49, Taiwan has lived under the threat of invasion and annihilation by the regime in Beijing. Its survival as an independently governed entity has been wholly dependent on the support of the United States. As China has grown in economic power, Taiwan has found itself increasingly squeezed with many countries strengthening their relationships with Beijing while diminishing those with Taiwan. In view of this and of the universal male military requirement, one might suppose that defense spending is a heavy burden for the Taiwanese economy. Yet that is not the case. Indeed, defense spending as a percent of GDP has declined from 3.49 percent in 1995 to only about 2.54 percent today. This means that Taiwan has bet that it can rely on the U.S. defense umbrella while concentrating its own energy on economic competitiveness. Indeed, one issue of contention between Taiwan and the United States today is that Taiwan has not actually ordered a large number of fighter aircraft that the White House authorized for sale some time ago. It remains to be seen whether this has been a wise choice on the part of Taiwan.

Labor

While in power on mainland China, the KMT regime of Chiang Kai Shek had banned labor unions out of the belief that they were nothing more than communist fronts. While unions were not banned after the KMT fled to Taiwan, they were strictly controlled under the umbrella of the KMT controlled Chinese Federation of Labor. Strikes were essentially banned and no labor hours were lost to labor disputes. Unions were enterprise unions and had little power to bargain for higher wages and benefits. There was no unemployment insurance or welfare with the consequence that, as in Singapore, costs of hiring and firing were quite low and wages were flexible. On the other hand, from 1953 until the early 1990s unemployment rates remained at around 2 percent and real wages grew at close to 10 percent annually.

After the end of martial law in 1987, organized labor outside the state controlled system began to develop, aided by the DPP and other opposition political parties. But these tended to be single-issue unions that
dissolved once their demands had been met. Indeed, the popularity of independent unions actually declined in the 1990s until the government’s privatization program galvanized workers in the state owned enterprises about to be privatized to organize and take control of the state managed unions in their workplaces. But the problem was that just as the unions were beginning to learn how to operate outside the state system, their base began to evaporate as Taiwan’s manufacturers started to move to mainland China and the island’s industry structure began to shift dramatically toward service industries that typically are not unionized.

On top of this, the labor law prohibits unions in companies with fewer than 30 employees (many service companies), allows only company unions and often only factory specific unions, prohibits unions for certain kinds of workers such as teachers, and restricts strikes and demonstrations by government employees. Even when allowed, strikes are difficult to call. They cannot be held while mediation is on-going, and no strike can be called without a two thirds majority of the vote of the union membership. As a result, there have been only 36 strikes called since 1987, and two thirds of them involved bus companies. Not surprisingly perhaps, only 6 percent of Taiwan’s workers are members of unions.

Nevertheless, in alliance with the DPP the unions and workers in general have made substantial gains. Thus unemployment insurance was instituted in 1999 and this was supplemented by the Employment Insurance Act of 2003 that provides not only unemployment insurance, but also counseling, retraining, and early reemployment bonuses. In addition, a program to expand employment in public service was launched in 2003 to help reduce the jobless rate that was then just over 5 percent while other initiatives to upgrade job skills and promote sustainable employment were also introduced. Further, an NT$5,000 per person per month subsidy scheme was added to encourage companies to hire the unemployed.

Having said that, unemployment is now down to about 4 percent while labor force participation remains high at its historical level of about 60 percent with the male rate having declined slightly from 72 percent to 68 percent while the female rate has climbed a bit from 45 percent to about 48 percent. Productivity remains high with over a third of the labor force being university graduates and over two thirds having at least high school or vocational school training.
Health and Welfare

Until 1995 there were a variety of industry sector and government employee health care insurance schemes but no generally available public health care and very little welfare. In that year, however, a national health care system was introduced that covered the entire population and that was later made portable so that workers do not lose health care coverage if they change employers or even if they leave the work force.

Pension benefits had been even more varied and minimal than health insurance. Although all employers were supposed to have pension plans and to contribute between 2-15 percent of wages and salaries to their company funds, the law did not require full funding of pension funds. As a result only about ten percent of Taiwan companies actually had a reasonable funded pension plan until 2005. Moreover, an employee did not vest until having worked at a company for 25 years, and he or she lost the pension entirely by a change of employer. In July of that year, a national pension plan was finally adopted. A defined benefit plan, it will be mandatory for all employers and will also be portable for employees. It will require a 6 percent of wages and salaries contribution by employers. Employees will be able to contribute up to another 6 percent on a voluntary basis. Driving this was the rapid population aging Taiwan is facing like many other countries. Today 9 percent of Taiwanese are 65 or older. That will rise to 10 percent by 2011 and to 30 percent by 2051. The question, however, is how industry will be able to fund the plan since it will mean an additional bill estimated at about US$80 billion and could become a significant competitiveness issue.

However, health and welfare costs remain quite low for Taiwan compared to many other countries. For example, Taiwan spends only 6 percent of GDP on health care overall and the government costs are only 3.5 percent. This, of course, is above Singapore but far below the other industrial countries. At the same time, life expectancy is 77.43 years on average with men at 74.67 and women at 80.47 years. So this is a very low cost for a very good result. As in the case of Singapore, there is extensive preventive care and use of
digitalization to control record keeping and other costs. Taiwan’s total government expenditures on social costs come to only about 4.5 percent of GDP.

Education

Education has long been a high priority for Taiwan which spends about 6 percent of GDP on its educational system and whose students consistently rank near the top of the various international comparative exams, especially in science and math. Until recently the system was rigidly centralized under the management of the Ministry of Education. This control has been loosened a bit since 1988 and particularly since the advent of DPP government. Nevertheless, it is still a very unified system with a standard nationwide curriculum, common standards for teachers, little variance in school budgets and quality, and a standard examination program with, as in the case of Singapore, a tendency to test frequently and to put great emphasis on test results. There is a long tradition of rote learning, and efforts are being made to encourage creativity and individuality in response to criticism that the system is not oriented toward innovation.

The system begins with two years of pre-school and then six years of elementary followed by three years of junior high school. At this point the class divides. Some go on to vocational school for two years. Others go by examination to three years of high school and still others go to a five year vocational school program. At the end of high school, some go on to university and others then also go to junior colleges. There are also vocational/junior college options and those who did the senior vocational school can also try for entrance to university. So, although the examination process is rigorous, there are some options and second chances for late bloomers.

Since 1976, Taiwan has dramatically raised the percent of its population with secondary and tertiary education to 49 percent and 32 percent respectively. Recent laws to raise the priority of education have stipulated substantial increases in government spending on education. Thus, in 2005, the Taiwan government spent over 18 percent of its revenue on education, a sum that amounted to over 6 percent of GDP. Today, fully 70 percent of students plan to pursue higher education and 27 percent anticipate doing a
graduate degree. Moreover, surveys show that 90 percent of parents have set an educational goal for their children.

### Average Mathematics and Science Scores of Eighth Grade Students, 2003

<table>
<thead>
<tr>
<th>Country</th>
<th>Mathematics Score</th>
<th>Science Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>610</td>
<td>590</td>
</tr>
<tr>
<td>Taiwan</td>
<td>590</td>
<td>570</td>
</tr>
<tr>
<td>Japan</td>
<td>570</td>
<td>550</td>
</tr>
<tr>
<td>Estonia</td>
<td>550</td>
<td>530</td>
</tr>
<tr>
<td>United States</td>
<td>530</td>
<td>510</td>
</tr>
<tr>
<td>Sweden</td>
<td>510</td>
<td>490</td>
</tr>
<tr>
<td>Israel</td>
<td>490</td>
<td>470</td>
</tr>
</tbody>
</table>

Particularly noteworthy is the emphasis Taiwan places on science and engineering education. Nearly half of all bachelor degrees are in these fields and Taiwan ranks second in the world (just behind Finland) in the percentage of 24 year olds with first university degrees in science or engineering. Indeed, this emphasis is so strong that Taiwan’s Outlook for 2015 calls for a better balance between culture and technology and also for more creativity and study abroad.

Two areas of emphasis for the future are creating world class universities and expanding continuing education. There is a serious drive to have a Taiwanese university ranked among the world’s top 100 and to have at least ten academic departments ranked among the top in Asia by 2008. To this end the government has appropriated $1.5 billion additional funds annually to beef up the universities and has taken a number of other dramatic steps. For example, laws have been changed to allow a foreigner to become President of a Taiwanese university. At the same time course requirements and schedule time tables have been relaxed to encourage flexibility and creativity. Perhaps most importantly, universities have been required to rate their faculty members.

The link between universities and the corporate world has been mediocre in the past. On the one hand, there was much emphasis on training engineers for Taiwan’s manufacturing sector and attention was given to matching the demand and supply of technically trained workers through coordination with the technical institutes and universities. On the other hand, academic research tended to be insulated and isolated from the real world. The new plans are for much more joint innovation between industry and academia. The science parks have always been a mechanism for joining the universities and the corporations. More emphasis will be placed on this as well as on encouraging joint research in the technical institutes.
Finally, new emphasis will be placed on lifelong learning. It is estimated that as much as 60 percent of the population is now going to school in one way or another. The target is to have 80,000 people enrolled in life-long learning programs by 2008.

Technology and R&D

Taiwan has understood for some time that its future both economically and politically is highly dependent on being competitive in technology. This is obvious from the entire thrust of its economic strategy and industrial policy over the past twenty five years. It is also obvious from the all the data we have on the structure of Taiwanese industry and the content of its exports. Until now, however, this effort has grown largely out of and been an extension of Taiwan’s role as an engineering and manufacturing based economy. It has therefore focused on developing into a producer of the leading edge technology products, particularly
in the ICT field. However, now that much of the actual manufacturing is moving to mainland China, there is a new emphasis on Research (instead of mainly the D done in the past) and on broadening the areas of technology development beyond ICT.

The main body guiding future strategy is the National Science Council (NSC) whose latest plan is the National Science and Technology Plan for 2005-2008. This envisions raising Taiwan’s technology capability to that of the advanced countries by 2010. Along the way, this will mean raising R&D spending to 3 percent of GDP by 2007, and increasing the number of research (not development or engineering) personnel to 4 per 1000 of population also by 2007. There is also a target of 6 million broadband internet users by the end of this year.

The plan outlines six major strategies with 185 separate measures to be implemented to make Taiwan into an international “Innovation and R&D Base” that will increase the value added and the digital ration of the economy. This effort has already led to the creation of 87 R&D centers and to the attraction of 27 MNC R&D operations. In addition, the plan calls for $1 billion to be invested in developing six strategic industries – soft electronics, nanotechnology, RFID, Smart Robots, Smart Vehicles, and Living Spaces. Finally, three new industrial parks are being planned which will focus on biomedical technology and communications and knowledge based service industries. Of significance is the fact that these parks include not only R&D and industrial facilities, but also ties to the network of research institutes and universities as well as incubators and links with the SME and venture capital networks.

That Taiwan is moving toward Research and Innovation does not mean it is ignoring technology extension and enhancement of its core competence. One current objective is to become the IPO capital of the world. In this case, IPO does not mean Initial Public Offering. Rather it means International Procurement Office. Already such companies as Apple, Cisco, Dell, IBM, Samsung, Toshiba, Siemens, and Philips maintain IPO’s in Taiwan. Last year they procured over $70 billion worth of items from around the world from the Taiwan base. This business is growing at the rate of 12 percent annually.

Another current objective is to develop the next generation of Wireless Broadband and related services. (e.g. WiMax +3.5/4G). This is intended to lead to development of the digital home (e.g. Intelligent Housing, medical devices, and home multi-media entertainment systems.). Healthcare is also seen as an extension in terms of portable medical equipment and devices. Another focus is the so called Green Industry with emphasis on solar devices and energy saving technology. The objective is to generate production value of about $400 billion by 2015 in these areas.
More broadly, the objective is to use China as the factory and to leverage Taiwan’s logistic, technology, educational, and partnership advantages to make Taiwan the IT hub of the Asia-Pacific Region. Taiwan believes it can “manage mainland China better than anyone else” and plans to turn that into its prime competitive advantage. Whether it will work or not only time will tell. But Taiwan will not fail for lack of forethought, planning, and effort.

**SMEs and Venture Capital**

Small and medium sized businesses have always been an unusually large part of Taiwan’s industrial landscape. Although they constitute an unusually large proportion of the Taiwanese economy and have been in many ways key to much of Taiwan’s success, SMEs have generally been left alone by the government’s economic ministries and agencies – for both good and ill. The fact that SMEs have been allowed to flourish is evidence that the government never overly centralized economic power in the hands of the major state owned companies or government industries. Taiwan does not have any domestic version of the big chaebols and keiretsus that dominate the economies of South Korea and Japan, for example. Taiwanese entrepreneurs took advantage of this freedom to become the backbone of the island’s economy, particularly in light manufacturing industries like shoes, apparel and electronics. They have also often led the way in international trade and investment.

Pao-Cheng Shoes, for example, is a firm that has grown from a small operation based in the living room of its founder to become the world’s biggest shoe maker. Pao-Cheng continually expanded its operations in Taiwan until rising wage pressures forced it to move its operations offshore – thus becoming one of the first wave of Taiwanese overseas investors. By the mid 1990s, the firm had 17 production lines up and running on mainland China, a further 11 in Indonesia, and 8 more in Vietnam.

Taiwanese firms have traditionally funded their growth the old fashioned way – through cash flow and close relationships with local commercial banks. The Taiwanese government initiated the domestic venture capital sector in 1984 when it created a venture capital fund to assist with the creation and development SMEs. This policy was a belated acknowledgement by the government of the power and significance of SMEs to the Taiwanese economy – and the need to provide them with new sources of capital as the economy moved up the ladder to ever more sophisticated and technologically advanced businesses. In 1998 measures were introduced to enable SMEs to take advantage of the incubators in the science parks, and the current Development Vision calls for stronger credit guarantees to the SME sector into which there are now over 100,000 new entrants each year. To encourage those entrants and foster their development into more than mom and pop operations, Taiwan has developed some 190 Venture Capital funds, many of which have close ties to Silicon Valley.

**Infrastructure**

A major part of Taiwan’s strategy is to upgrade its already good infrastructure to the world leadership level. Already near the top in terms of broadband users, Taiwan intends to have broadband in virtually every household by 2010. This effort actually goes back to the 1996 National Information Infrastructure act. Current plans include M-Taiwan which will be the largest Wimax testbed in the world. It aims to have 17 Key Stone companies providing wireless internet access at high speeds to 8 million subscribers nationwide without surfing barriers. Ports will also receive much attention. The plan to make Taiwan an IT hub for the
region revolves significantly around having world class port operations. The Free Port program and the Kaohsiung Harbor Intercontinental Container Center will assure that. (increase container capacity by 50 percent) Other key projects include mass rapid transit, island-wide high speed rail (Living Circle – any place in one day) extensive installation of desalination plants and wastewater treatment facilities, and creation of international arts and music centers. A total of $15 billion has been budgeted for these over five years.

Fiscal and Monetary Policies

In common with all successful economies, Taiwan has maintained very prudent fiscal and monetary policies. From 1960 to about 1990, Taiwan sustained average annual growth of 9.4 percent while unemployment remained below 2 percent and inflation ran at 4.3 percent during the 1970s (including the oil crises) and at only 3 percent in the 1980s. In the 1990s, average growth was 6.5 percent, inflation ran at 2.9 percent and unemployment was 2 percent. From 2000-2005 the numbers were 3.6 percent, 0.8 percent, and 4.4 percent respectively. For most of this time the income ratio between the top quintile in income and the bottom quintile was 4.17. This hit 6.39 in 2001 due to the affects of globalization and the dot.com bust, but has since come down to 6.03. That is a remarkable record by any measure.

Until the late 1980s, much of this growth was driven by high savings and investment rates that mobilized capital and labor. According to Lawrence Lau of Stanford University, increased utilization rates of capital and labor were responsible for almost all of the GDP growth in Taiwan from 1953 through 1985. Throughout this period, savings rates were very high - rising from about 17 percent of GDP in 1951 to roughly 40 percent in the 1970s and 80s. Interestingly, since the mid 1980s, the role of total factor productivity, a commonly used proxy for increases in technical progress and human capital, have accounted for roughly half of the growth in the economy. This reflects the shift to a more knowledge intensive and technologically oriented economy in Taiwan in recent years – as has the fall in savings rates from their peaks to about 25% today. .

Throughout the postwar era, monetary policy kept inflation controlled and avoided overvalued exchange rates, while fiscal discipline kept budgets in surplus since the early 1960s. Since the advent of the 1990s, the budget has gone into deficits of around 2 percent of GDP in every year except 1998. Nevertheless, public debt is still only about 38 percent of GDP. Given Taiwan’s high rate of saving and huge current account surplus (its dollar reserves are close to $300 billion), this level of debt is not a problem. Moreover, government revenue is only about 16-17 percent of GDP while spending is about 18-19 percent, so the government financial footprint is relatively small.

Taxes have also been a favorable factor. Although the top personal rate is a high 40 percent of income, the loopholes make the effective tax rate for most people only 12-14 percent. Moreover, the corporate rate is only 25 percent and that, again, is effectively lowered by all the incentives of the science and industrial parks and other industry promotion efforts.

Service Sectors

One of the most dramatic pictures to spring from the statistics is the shift of the Taiwanese economy from industry and manufacturing to services. Clearly this represents a repetition in Taiwan of the experience of other developed and developing countries as they grow more sophisticated. But Taiwan’s experiences here are especially relevant to Israel. Much of the development in services industries represents not so much a
shift away from manufacturing as the separation by outsourcing of activities that were once all part of the manufacturing operation. Taiwan has shed much of the manufacturing business that depends on low or semi-skilled labor to cheaper locations on the mainland or in South East Asia. But Taiwanese companies still own and manage many of these offshore manufacturing operations, and retain much of the higher value added work domestically in Taiwan. Management, research and development work, design, marketing and supply chain management are all still based in Taiwan and many of these jobs are now classified as service sector. Indeed, Taiwan has developed into perhaps the preeminent world leader in managing global supply chains. This will likely prove to be the key comparative advantage of Taiwan in the years to come.

Taiwan has also been striving to develop pure services industries like tourism and finance. One of the major efforts of industrial policy of recent years has been the attempt to develop Taiwan as a Regional Financial Services Center, partly at least out of envy of Hong Kong and Singapore and anticipated rivalry with Shanghai. Liberalization actually began in the late 1970s and has continued steadily as the economy developed and became more sophisticated. But with the advent of the 1990s and the turn toward a more services oriented economy, the notion of financial services as a new growth industry took hold and the planners began rapidly introducing programs to make Taiwan a rival to Hong Kong. Upon entering into the year 2000, targets were set to reduce the number of government owned banks from 12 to 6 and to halve the number of financial holding companies, and to have at least one domestic financial institution run by a foreign owned entity or be listed on an overseas stock exchange by the end of 2006.

The most recent three year Spring Plan is even more ambitious, calling for Taiwan to become a leader in the Asian securitization, wealth-management, and futures industries while also inducing top-notch local and foreign companies to make Taiwan their first-choice securities market. The plan goes into great detail, listing several hundred specific measures and reforms to be undertaken towards these goals. Unfortunately, we believe that this is an example of an unwise industrial policy - while becoming a major financial services hub is no doubt appealing to the government bureaucrats behind the plan, Taiwan will never be as attractive a location for financial services as Hong Kong, Singapore or Shanghai and thus the time, effort and money spent on developing the financial sector is unlikely to meet its objectives. While a more competitive financial sector will be a net benefit to the domestic Taiwanese economy, and hence some reforms should no doubt go forward, Taiwan should not waste resources trying to compete with the real financial centers of Asia because there is a problem – China.

Hong Kong has long served as the gateway to investment in China and Taiwan can never hope to replace it, not least as long as the various restrictions on investment and transportation links the government has enacted remain on the books. But even if cross-Strait relations were somehow normalized, Hong Kong has built up a competitive advantage in financial services, with a strong base of human capital and powerful banking institutions with close ties to the mainland. The most significant competition facing Hong Kong comes from Shanghai, the historic financial center of China before the communist revolution and a city with the pretensions – and perhaps the political connections in Beijing – to try to regain that role.

Likewise, Singapore is well placed to continue to exploit its strengths as a center for wealth management and merchant financing. It is a major hub of South East Asia, has built up much in the way of human capital and institutional capacity, and is becoming an ever more popular source for capital flows from the Middle East and other oil exporting nations as well as mainland China.

**International Trade**

Export led growth has been at the core of Taiwan's development strategy from the early 1960s and it has made Taiwan, with a population of only 22 million people, the world’s 16th largest trading nation. Total trade
is now over $400 billion and exceeds the economy’s GDP. Spurred by the development of China, it has been growing at the rate of nearly 20 percent annually which is faster than the growth of global trade. Taiwan has thus increased its share of the global trade market.

Although the structure of the economy has swung strongly to “services”, exports remain a matter mainly of goods. Here the swing has been from mechanical devices and commodity manufactures to electronic equipment and components. Although plastics, steel, and such products still account for a large part of trade, it is the high end of these lines that is being exported. Not surprisingly, imports mirror the export composition with the exception of oil.

![Trade Balance - Taiwan](image)

The really big development, of course, is the shift of trading partners. In 1995, Taiwan exported virtually nothing to mainland China (although 23 percent of exports went to Hong Kong) while nearly 24 percent of its exports went to the United States. In 2005, nearly 22 percent of exports went to mainland China with another 16 percent going to Hong Kong. Only 15 percent went to the United States. This again highlights the importance of the mainland to Taiwan and reemphasizes the Taiwan dilemma.

In fact, mainland China is not just a problem for the financial services industry. It is THE problem for Taiwan. The crux of the issue is that Taiwan cannot go where it wants to go economically without integrating more with China. But it cannot stay where it wants to stay politically if it goes ahead with such integration. The more it integrates the more leverage it gives to Beijing to bring political pressures to bear. For example, in order to maintain technological leadership, Taiwan currently prohibits the export of certain technologies to the mainland. But as U.S., Japanese, and other global companies set up shop on the mainland and demand cutting edge components from their suppliers the Taiwanese tend to be shutting themselves out. Or, take the plan to be a financial hub. It is going to be very difficult to be a financial hub in Asia without having fast communication and travel to China. But Taiwan presently has no direct air links with China. If you are in Taipei and want to fly to Shanghai, a direct flight of only an hour and a half, you have to go first to Hong Kong or Tokyo and then to China, flights of six to eight hours. Thus, until Taiwan figures out an acceptable political settlement with the mainland, not only the idea of being a financial services hub, but of being any kind of a hub will be difficult to realize.

**Lessons for Israel**

Taiwan has developed a very competitive business environment centered on its international orientation and its strengths in engineering and manufacturing. It is moving aggressively to enhance these strengths and to
branch out into services and high-level research and development in high-technology sectors. Three important lessons from Taiwan’s history of economic development stand out for Israel.

First, Taiwan has shown that industrial policies can be used to enhance and promote entrepreneurial activity and technological innovation. While the ultimate success of Taiwan Semiconductor Manufacturing Corporation, for instance, must be due to a combination of strategic public policies, entrepreneurial energy, excellence in engineering, and to no small degree luck, the fact that a Taiwanese firm could essentially come out of nowhere to become a dominant player in the semiconductor industry speaks to the ability of Taiwanese business and political leaders to overcome obstacles to growth and promote investment in high technology industries. Economic development is ultimately about structural change, and as Taiwan has moved from a predominantly agricultural economy to one based on manufacturing to today’s technologically driven businesses, the state has proved adept at fostering these developments and providing the extra push that enables private industry to enter new markets and fields.

Second, Taiwan’s openness to international trade, investment and technology have allowed it to shed low-skilled manufacturing jobs and move up the value added ladder to more sophisticated knowledge intensive fields. Taiwanese business people’s mastery of supply chain management have allowed the country’s businesses to retain an important role in traditional industries like footwear and electronics manufacturing even as the factories themselves have left Taiwan and moved to locations with cheaper labor. Taiwan has not abandoned the management expertise and technical know-how gained in its previous stages of economic development (as so often happens when economies shed manufacturing jobs), nor has it fought to protect uncompetitive industries. Instead, it has constantly adapted its human capital to changing realities, building on previous lessons learned and expertise gained.

Third, although state agencies and ministries have played an important role in overcoming obstacles to growth and promoting investment in new industries, the country has not allowed economic power and decision making to become too concentrated in the hands of bureaucrats. The country’s stable of small to medium sized enterprises have proved to be not just an engine of economic growth, but have also managed to ensure the most equitable distribution of income of all the Asian Tiger economies.
Thus far we have focused on case study analyses of the individual countries in our benchmarking project. But by definition, our benchmarking project entails identifying and highlighting a set of ‘best practices’ which can then be adapted and refined to address the specific strengths and weaknesses of the Israeli economy.

The following chapter will highlight the relative standing of the Israeli economy and its underlying components as compared to its peers. We will begin by looking at education, followed by examinations of infrastructure, innovation and high-technology sectors, the business environment, labor markets, institutions, social stability, and the macro economy. Each section will include a brief overview, followed by our benchmarking comparisons and a discussion of some of the most effective public policies and economic development strategies we have identified in our target countries.

**Education**

In the increasingly competitive global economy, strong educational systems are becoming more than just a necessary precondition for economic growth; they are becoming driving forces of innovation and new businesses in their own right. As companies strive to become more efficient and productive, they depend on the underlying human capital of their employees – which has been honed and developed in the corridors of schools and universities. But strong educational systems do not merely serve the high-tech industries that recruit among skilled scientists and engineers; the ‘creative destruction’ that capitalism often forces on economies – the wholesale movement of jobs and industry to new jurisdictions or the adoption of new production techniques and practices – increasingly requires that education systems match their output with demand in the labor market, and provide continuing education to individuals displaced by economic change.

Teachers and administrators are thus being forced to work ever more closely with governments and the private sector to ensure that the skills and know-how of their students are constantly improving and meeting competitive challenges from abroad. The mounting responsibilities being placed on educational systems are requiring new strategies, new methods of cooperation and collaboration and, of course, more funding.

As the following few charts show, however, simply throwing more money at education does not necessarily translate into better performance. As has been emphasized so often elsewhere in our study, strategies matter, and the focus and emphasis of each country’s educational strategies in large part determines the strengths and weaknesses of each individual system. Israel, for example, consistently ranks with Sweden as the country spending most on education as a proportion of GDP. But Israel’s spending has been skewed towards tertiary education, and the country maintains separate and unequal primary and secondary educational systems for its secular, Arab and Ultra-Orthodox citizens respectively. And while Israel’s pupil to teacher ratio is low by comparative standards, Israeli teachers’ compensation trails woefully behind its peers. Israel’s recent test scores belie these factors. While the country has a few strong, internationally recognized universities and research institutes, the average test scores of its primary and secondary students have been falling, and its schools have been struggling to recruit qualified and competent instructors.

Sweden, by contrast, has placed a much greater emphasis, and provided much more funding, towards improving its adult education programs and life long learning, compensating teachers, and providing opportunities to students of all levels. Sweden has even introduced school voucher programs that give students choice and promote healthy competition between schools. The effectiveness of the country’s educational system reflects these priorities.
While Israel and Sweden consistently spend the most money on education, Singapore, Taiwan, and Finland seem to get the best results, at least at the primary and secondary levels as measured by international test scores in math and science. Singapore is particularly striking because it spends two thirds to half as much as all the other countries except Ireland and has a student teacher ratio that is twice as high. Yet its scores are well ahead of all the others. Israel, on the other hand, spends the most and has one of the lowest student/teacher ratios. Yet its test scores are at the low end of the scale.
While all the subject countries are pursuing economic development strategies that focus intensely on further development of sophisticated technology and research and development capabilities, the enrollment of students in science and engineering is much higher in Finland and Taiwan than elsewhere. Sweden and Singapore are mid-rank in this regard, but Israel comes in next to last among the subject countries despite having some of the best universities (although it is still ahead the United States, the dead last runner).

All of the subject countries in our study have identified unevenness in the quality of education between different regions and ethnic groups as a problem and are making strong efforts to resolve it. All have also identified the need to increase labor force participation rates, lifelong learning, matching education to work, and fostering greater creativity as major educational priorities. Several countries provide leading examples of how to attack these issues.

Singapore, for example, has been relatively successful at ensuring that its three main ethnic groups receive the same access to education and leave school well prepared for the workforce. For a long time, Singapore has tried to erase the ethnic divide between Chinese, Malays, and Indians in educational terms through several methods designed to create equal opportunities for all and encourage everyone to achieve high standards of literacy and scientific and mathematical knowledge. Singapore maintains a standard curriculum for all schools all of which are under one central authority. The spending on schools at the primary and secondary level is essentially the same for each school of each category of education as is the quality of teachers. English is the language of instruction except for language classes and for a few special schools. Testing is frequent and extensive and is used as a guide for allocating special help to those who need it as well as for directing students to appropriate areas of study. Special task forces and budgets have been allocated to working with the leaders of the ethnic communities to encourage leveling up and to provide the means for doing so. The results show that these efforts are having the intended effect.

Singapore is also focused on developing world class universities, and has set about recruiting foreign universities and professors to jump start this effort. Just as it induced foreign MNCs to move their factories to its shores in the past, it is now inducing educational institutions and leaders to set up campuses and/or engage in joint ventures in with Singapore universities.
Finally, like all the others, Singapore faces the question of matching education with the work skills that will be needed in the future. Programs which prepare students for professions for which there is no demand in the labor market are ultimately a waste of time and effort, so Singapore has taken great care to conduct a forecast and inventory of future jobs and skills needs and is adjusting the incentives for students and the programs of the various polytechnics, universities, junior colleges, and other institutions accordingly.

This strategy of preparing a skills map to guide the development of educational programs is very relevant to the challenge Israel faces of increasing its labor force participation rate and educing inequalities among its various ethnic groups and communities. Like Singapore, Ireland has also made great efforts in this area and its work provides a template upon which Israel could base its efforts. The Irish program looks out to 2020 and includes a sophisticated analysis of the likely employment trends in all the major sectors of the Irish economy. In order to meet the demand from growing sectors, and shift supply away from sectors that are in decline, the Irish set specific goals for their educational institutions. Some of these goals include getting 48 percent of the work force to have tertiary level qualifications; 45 percent of the work force to gain secondary level degrees; getting 500,000 workers to enroll in adult education programs and gain certificates or degrees in their field of choice, reducing the secondary school drop-out rate from 20 percent to 10 percent by 2010 and to 5 percent by 2020; and ensure that 72 percent of all students enroll in tertiary education by 2020.
Benchmarking Education Best Practices:

1. Establish a standard curriculum. All of the countries in our study mandate core curriculums that ensure all students receive basic training in the fundamentals of math, science and languages. A standard curriculum is important not only in terms of teaching basic skills, but in fostering a sense of community and national identity among students.

2. Insist on English fluency. Singapore and the Scandinavian countries have achieved extraordinary levels of English proficiency by giving it a high priority and beginning intensive English classes at an early age. As English is the language of global commerce, this has greatly increased their international competitiveness and attractiveness as locations for foreign direct investment.

3. Coordinate education policy with labor market objectives. Graduates must have skills that are in demand in the labor market. Ireland conducts periodic ‘skills maps’ that chart future demand in the labor market and adjusts academic programs in response. Singapore also integrates its educational programs with its broader economic development plans to ensure that growing industries will have the labor they need to continue expanding.

4. Expand the number of science and engineering graduates. Individuals with degrees in science and engineering fields are in demand all over the world. Ireland tripled public expenditure on education from 1985 to 2005 and raised the percentage of students going for tertiary education from 11% in 1965 to 57% by 2003. Special emphasis was placed on science and engineering degree programs - Ireland's 48,000 college graduates included 57% with degrees in engineering, computer software, business or science – twice the EU average.

5. Rationalize and organize basic research and integrate it with economic development policies. The Academy of Finland coordinates the research programs in Finland’s university system and is the main
supplier of research grants. The Academy ensures that its grants are awarded through a competitive system of peer review that is organized around four research councils. The councils are staffed by leading academic who, in conjunction with the Academy, the Finnish government, and Finnish R&D agencies, identify specific subject areas for priority funding. The Academy is an important part of Finland’s ‘innovation system’ and strives to promote cooperation between academia and the private sector in R&D programs so that basic research leads to commercial development wherever possible.

6. Ensure equality of educational opportunity. Singapore used its school system to reduce tensions between its different ethnic communities by ensuring that schools were not segregated, had access to similar levels of funding and quality teachers. This system ensured that all students developed core competencies in basic skills and helped to promote a unified national identity among all ethnic groups.

7. Make special efforts to improve poor performing schools. Estonia's 1996 Tiger Leap program expanded computers and Internet links in schools, trained teachers in the use of computers and developed a computer sciences curriculum, to improve and import innovative high technology best practices throughout Estonia's educational system.

8. Include educational institutions in emerging technology clusters. High tech industries are increasingly dependent upon universities to provide employees, basic research, and consultation. Singapore, Taiwan and Finland are promoting this kind of cooperation by building science parks and technology incubators that provide the opportunity for the education sector and private business to work together.

9. Vocational and adult education programs can improve the productivity of traditional industries. Sweden has made huge investments in vocational and adult education programs and over one million Swedes have participated in life long learning.

10. Enhance the status of the teaching profession. Israel pays its teachers poorly, and so does not manage to attract the most highly skilled individuals to the teaching profession. In Finland, by contrast, teachers are paid well and enjoy a high social status. Typically less than 15% of all applicants in any given year are accepted into Finland's teacher training programs, ensuring a supply of high quality teachers.

Infrastructure

The breadth, quality and reliability of domestic infrastructure are becoming increasingly important components of any nation’s economic competitiveness. Businesses of all types, from large multinationals to small start ups, increasingly base their investment decisions and placement of offices and factories on assessments of the quality of infrastructure in competing jurisdictions. Modern economies require integrated networks of roads, rail lines and ports, along with modern telecommunications networks and reliable supplies of energy. Many types of infrastructure are being transformed by new technologies, requiring constant upgrading and investment by local governments. Modern congestion pricing, for example, depends on integrated camera and computer networks to manage traffic flows, while alternative energy sources are causing countries to rethink their energy systems.

In this regard, investing in new infrastructure can also benefit local economies, as domestic companies gain expertise in emerging new technologies or leverage technological advances to create new products and services. It is of the utmost importance, however, that infrastructure investments flow towards real needs, and not expensive pork-barrel projects that suck money away from more pressing needs.
All of the subject countries in our study recognize infrastructure as a critical element of future competitiveness. Singapore, Sweden, and Finland have developed world leading infrastructure through many decades of investment. But while Ireland, Taiwan, Estonia and Israel cannot yet match the standards set by these leaders, there are by no means out of the race. Technological advances mean that developing countries have the opportunity to leapfrog older countries, who must adapt their existing systems, by installing the latest, must cutting edge infrastructure.

Estonia is good example of this process. While it’s overall infrastructure (roads, rail etc) is less good than that of the others, its internet and broadband capabilities are among the best. This reflects the fact that Estonia understood the importance of modern telecommunications and leveraged previous investment by Swedish and Finnish firms to install the latest technologies.

Among our subject countries, Ireland and Taiwan in particular are looking forward over the next few years to extraordinarily ambitious infrastructure development plans. Both countries are planning to spend roughly 5 percent of their GDP annually over the next five to ten years to expand and modernize their infrastructure. Other countries are hardly standing still either. The point here is that just to keep up with its competitors Israel must run not walk. As the following data will show, Israel is a middle to low performer among its peers, which suggests both a large potential for competitiveness gains from new infrastructure programs, and harsh consequences if it fails to keep up.

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Notes

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Benchmarking Infrastructure Best Practices:

1. **Use infrastructure to build global competitiveness.** Don’t underestimate the importance of modern, reliable infrastructure. Singapore based a large part of its development strategy on building fast and inexpensive air and sea transport. Ireland used its EU structural funds to pour money into new infrastructure projects that greatly enhanced its attractiveness as a location for foreign direct investment. Taiwan is currently expanding its network of infrastructure to catch up with its more developed competitors, and Sweden and Finland have been investing in new roads, rail links and energy infrastructure for decades.

2. **Integrate disadvantaged regions into the overall strategy.** Improved infrastructure is one of the most effective means of integrating disadvantaged regions into the national economy. Ireland, for example, is building ‘Gateway’ cities and ‘Hub’ towns that lie at the nexus of transportation corridors to stimulate major investment in the rural economy and in regional growth.

3. **Build science and industrial parks with the latest cutting edge infrastructure.** Both Singapore and Taiwan make effective use of science parks and special industrial zones with totally reliable, cutting edge infrastructure. Companies increasingly examine the underlying transportation and energy systems in areas they are considering investing in, and developing countries often have an advantage in that they can ‘leapfrog’ more developed countries by installing the latest technologies. Mobile phones are a good example of this phenomenon.

4. **Provide transportation options.** Effective mass transit systems are not designed to be replacements for roads, nor are they built solely for poor people who cannot afford cars. Subways, light rail, commuter rail, buses, bike lanes, pedestrian zones and private cars are all integral parts of a comprehensive transportation system. In Stockholm, many business people choose to commute by rail because it the most efficient way of getting to and from work. Commercial and residential developments built near transport hubs also tend to more energy efficient, and require fewer water and sewer mains and other infrastructure, than sprawling suburban parks, and can greatly improve quality of life if designed properly.

5. **Manage road traffic congestion.** Israel has one of the world’s highest vehicle densities per km of road. Singapore manages its road density through both high auto registration fees, which a driver must purchase at auction in order to be able to buy and drive a vehicle and Electronic Road Pricing, in which overhead gantries scan and automatically deduct a toll from each car's cash card, based on time of day and congestion and location. London has also successfully adopted this system.

6. **Use technology and innovation to meet demand for energy.** New technologies are transforming the way countries build their energy infrastructure. After the oil shocks of the 1970’s, Finland began investing in
alternative energy to reduce its dependence on imported energy. 25% of its energy is now nuclear, and 20% is biomass. Finland has increased its energy efficiency by using district heating in its urban centers, with modern gas-fired power plants that can recover up to 92% of total energy content of the gas by producing both heat and electricity.

7. Integrate national infrastructure into regional systems. Estonia is leveraging its legacy transport links with Russia to greatly increase its trans-shipment trade. This trade currently accounts for over 8% of GDP and is likely to grow as improved links come on line. The country is investing in new ports, customs facilities and other transportation infrastructure to meet growing demand and congestion. In the future, Israel could provide similar services to its neighbors.

8. Use advanced telecommunications to leverage high-tech industries. Estonia has used its brand new, cutting edge telecommunications infrastructure to jump start a whole new range of innovative companies. Skype, for example, has captured a growing share of the international calling market by using software technology to undercut traditional voice providers on the internet. New Web 2.0 and online media companies are requiring increasing amounts of bandwidth to distribute music, video and other electronic goods and demand constant investment in new capacity.

9. Focus new infrastructure investment on developing tourism. Ireland is utilizing new infrastructure to meet its goal of doubling tourism revenues to $8 billion by 2012 and increase the annual number of foreign visitors to Ireland from 6 to 10 million. Singapore is relying on its world class airport and regional transportation links to promote tourism and increase the size of its service economy.

Innovation and High-Tech

One of the most important and far-reaching effects of globalization has been the intense competitive pressure brought to bear on many traditional manufacturing industries and low-skilled jobs. The entry of China and other developing countries with masses of cheap labor into the global economy is forcing many countries to attempt to move up the ladder of higher value added industries and use technology to increase the productivity of their workforces throughout the economy. The countries in our benchmarking study are at the forefront of this trend, and it is striking the extent to which all of their economic development strategies identify it as their main competitive challenge. In response, most countries are targeting emerging high tech industries like bio-tech and software as sources of future growth and employment, in addition to using new capital equipment and management techniques to improve the productivity of their existing traditional industries.

Increasing R&D funding is at the center of many of these development strategies, but our subject countries use a wide variety of methods and strategies in this regard. Finland and Sweden, for example, are among the biggest spenders on R&D, and they benefit from having large, established global companies that spend a lot of their own money on R&D. They also benefit from a large pool of excellent scientists and engineers who are relatively inexpensive in comparison to their competitors in the developed world. However, they suffer from a lack of venture capital, new start-up companies, and entrepreneurial spirit. They are making enormous efforts to provide incentives and support for incubators, even better infrastructure, commercial R&D, basic research at universities, and closer ties between universities, corporations and venture capital funds. In addition, both countries are looking at ways to increase the flexibility of their workforces, not least by taking measures to reduce the risks of leaving a secure job with its health and pension benefits to join a start-up.
They also are very interested in finding ways to use high tech to leverage low tech. Both, especially Finland, have had some success at this. Despite its relatively high cost production base, Finland has managed to maintain leadership in the cruise liner market by using technology to enhance quality and productivity. The same is true with regard to paper making equipment and forestry products. Many of the grants issued by Tekes, the Finnish state R&D fund, have gone to traditional industries like the forestry and shipping sectors. Sweden also has maintained much more manufacturing domestically than might have been expected by dint of applying new technology to older industries.

Ireland, Taiwan, Estonia, and Singapore are all important producers of high technology products, but are less advanced in terms of R&D spending or cutting edge research institutes. They are all planning major increases in R&D spending, and, like Sweden and Finland, are creating extensive supports for entrepreneurs and new ventures. Taiwan and Singapore are especially focused on transforming their educational systems to produce more independent and innovative scientists and engineers and less rote learning. Singapore and Ireland are also sticking with a successful old formula by trying to persuade foreign MNCs to locate R&D centers within their borders and thus to import innovation. Taiwan, while depending more on home-grown talent and domestic companies, has been very successful in leveraging its capacity to manage factories and global supply chains to sustain its traditional industries.
Israel is the star of the group in terms of its culture of venture capital, new start ups, and its status as a global center for cutting edge R&D work. It is also the highest spender on R&D and has the most new company listings, the biggest venture capital pool, and the best ties to the U.S. technology community. But Israel is not without weaknesses. Israel has not succeeded in turning many of its start ups into large, successful international companies, and it has done relatively little to use technology to improve the productivity of its existing traditional industries.
Benchmarking Innovation Best Practices:

1. Establish a Comprehensive Innovation System. While Israel’s Office of the Chief Scientist has played a very positive and important role in building Israel’s high-tech sector, it could be yet more effective if it was part of a comprehensive innovation system directed at the Cabinet level and including representatives of business, labor and academia. The Finnish state has been extremely proactive with regards to innovation policy and economic competitiveness and its ‘innovation institutions’ could provide a model for Israel to follow.

2. Establish an Innovation Fund. Finland's "Sitra" had a large initial endowment, and when combined with Tekes, the state agency for funding R&D, have together evolved so that Sitra now functions as a kind of "public venture capitalist", providing specific startup companies with equity capital.

3. Leverage technical standards to create sustained growth. The Finnish government collaborated with other Nordic governments and adopted a series of technical standards that opened up wireless communication for sustained growth. Israel should adopt existing EU or US technical standards wherever possible, and try to encourage the adoption of open-source standards.

4. Build clusters, in which low-value-added operations play key roles as well as high-value-added operations. Finland has supported efforts to improve the productivity of its traditional industries in order to maintain their international competitiveness through targeted grants for R&D and the adoption of new technologies, products and production techniques. Finnish sawmills, for example, use energy produced from excess sawdust that has been converted into bio-fuel. This innovation was encouraged by grants from Tekes.

5. Avoid state-owned 'elephants'. Economic development policies should not be about protecting existing industries, but rather creating competitive business environments and nurturing the next generation of companies. Part of the secret of the success of Finland’s telecommunications industry was that there was no giant state owned monopoly telecoms provider to stifle innovation. The Israeli state should continue divesting its stakes in Israeli businesses and avoid granting monopoly powers to domestic companies.

6. Use the government as a ‘lead buyer’ of new, advanced technologies. New technologies can often be expensive to develop and commercialize. Singapore's government first computerized its operations as a demonstration both to businesses and families of how it could be done. The Israeli state can act as a lead buyer to both promote new Israeli high-tech companies and encourage the adoption of new technologies throughout the economy.
7. Color technology 'green'. Israel greatly lags in caring for its environment, but it has existing strengths in solar technology and water desalination facilities that it could build upon to improve its environmental performance and build new industries. ‘Green’ products are likely to become ever more important across a range of goods and services, so there is a strong economic case to be made for investing in green technologies as well. Taiwan has developed a plan to make itself into a Green Silicon Island, and the EU has launched several ‘green’ R&D programs that Israel could participate in.

8. Make high labor costs a source of innovation, rather than a competitive drag. Sweden's retail giant IKEA built a business model that neutralized the high labor costs in Sweden by sharply lowering production, shipping, and sales costs. Ikea has had, in turn, a large impact on productivity in Sweden's retail sector. As a corollary, Israel should end the practice of allowing in large numbers of foreign guest workers. These workers contribute to Israel’s high unemployment rate by depressing wages in positions that Israelis would otherwise take misallocating investment into sectors that Israel is not otherwise competitive in.

9. Build science parks to support innovative clusters. Both Singapore and Taiwan make effective use of science parks, which house activities linked to university research, medical services and engineering, and have far more extensive infrastructure than the typical Israeli incubator. Science parks help to encourage the development of clusters of companies in similar fields that often form collaborative partnerships and feed off of each others’ success.

10. Increase participation in international R&D and science projects. EU members gain substantial benefits from joining EU wide R&D programs. Finnish astrophysicists, for example, can work for the European Space Agency. The EU and the US both offer opportunities for Israeli specialists to join in joint research programs, which would provide expanded opportunities for Israelis and leverage previous investments by the US and EU in these areas.

**Business Environment**

Free market ideologues often argue that simply getting the government out of the way of free markets would solve many economic ills and result in more competitive businesses. Yet the truth of the matter is that market operate within a set of government defined rules and regulations that go a long way towards determining the outcome of the ‘game.’ This is not to say that more government is necessarily better than less, but rather that the policies we enact to overcome ‘market failures’ should be carefully crafted to promote economic competitiveness and growth. The trick then is to ensure that the plethora of rules and regulations that make up the ‘business environment’ of any given country are as efficient, transparent, and effective as possible.

In IMD’s Global Competitiveness rankings, some of the most worrying scores for Israel come in the area of its business environment. Apparently businesses in Israel are stifled by a regulatory environment that is overly complicated, opaque, prone to corruption, and mired in inefficiencies. This state of affairs compromises Israeli economic competitiveness and is a contributing factor in the relative lack of large global economies that Israel has produced, despite its dynamic start up and venture capital activity.
Ease of Doing Business - Overall

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<th>World Rank</th>
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Business Start Up Procedures

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<td>0</td>
<td>0</td>
<td>33.7</td>
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</table>
Benchmarking Business Environment Best Practices:

1. Reduce corporate taxes. Perhaps no single policy reform could do more to increase the international competitiveness of Israel than cutting corporate taxes. Ireland cut corporate taxes to 10 per cent, creating a newly attractive environment for investors, and helping to jumpstart foreign direct investment.

2. Simplify the tax code and implement a flat tax. Lots of tax breaks and loopholes result in inefficiencies and opportunities for corruption. Estonia established a flat tax - 22 percent on both personal and corporate earnings, with no tax on retained earnings - with no exemptions and no exceptions. They also created a system to allow individuals and corporations to file their taxes quickly and efficiently online.

3. Establish the rule of law as the bedrock of society. Transparency and good governance start at the top. Corruption among government officials should simply not be tolerated. Singapore pays its civil servants well and recruits highly qualified individuals, but it also takes a zero tolerance approach to corruption. Sweden and Finland likewise do not stand for corruption in either their public officials or their business leaders. Israel should hold itself to the same high standards.

4. Make rules and regulations as simple and transparent as possible. Too often complex rules and regulations operate as make-work programs for government bureaucrats. This can greatly increase the cost of doing business and lead to corruption. Singapore and Estonia have adopted principles of small government that created straightforward and effective regulatory environments. Singapore is routinely ranked as the best place in the world to do business as a direct result of its efficient and transparent regulations.
5. Integrate into global companies’ supply chains. Both Estonia and Taiwan have greatly benefited from integrating their economies tightly into global supply chains. Estonia has benefited particularly from being allowed to leverage previous Nordic investments in innovation, while Taiwan has turned the management of global supply chains into perhaps its core competitive advantage.

6. Reform corporate governance rules to promote long term investments and strategic innovation. Sweden’s corporate governance model promotes a long term investment perspective and helps to ensure that business and financial leaders have incentives to act in the best interests of the country at large. Israel could take steps to promote concentrated ownership by strategic investors (especially from the diaspora) with an eye to promoting the long term competitiveness and growth of domestic Israeli companies. Capital gains taxes can also be adjusted to promote long term investments and discourage short term ‘hot money’ flows.

7. Pension and Sovereign wealth funds can be an important source of capital. Temasek is the Singapore government-linked (yet independent) fund management firm that controls government investments in private companies in Singapore and abroad. It has a mandate to both make a return on its capital and promote the economic development of Singapore, and it has been highly effective in meeting that mandate. Temasek’s portfolio now amounts of $80 billion and it earns 18% on equity – equivalent to the target rate of many VC firms. In Sweden, government mandated savings and pension plans have led to huge flows of money into pension funds that became some of the biggest investors in Swedish capital markets. Israeli start ups struggling to make the transition to large, global companies could benefit from having access to a large pool of domestic capital.

8. Create programs to assist small and medium sized enterprises. SME’s often possess innovative new products or services but lack the management expertise or capital to take their businesses to the next level. Estonia developed a program to assist SME’s in areas like management expertise, access to funding and links with universities and research centers.

**Labor**

One of the most striking features of all the subject countries in our benchmarking study has been the relative harmony of their labor and business relationships. In every country, labor unions have tended to work cooperatively with business and the government to increase the overall competitiveness of the national economy. In some cases, like Singapore or Taiwan before democratization, this was at least partly the result of government intervention to prevent the development of strong independent labor unions. But in both of these countries, the wages and living standards of workers inexorably rose along with the development of the domestic economies, suggesting that the governments of both countries were concerned with the welfare of their workers and were not interested in giving business the upper hand over labor in all respects.

Moreover, the European countries in our study managed to live with strong and independent labor unions by dint of the sheer popularity of labor. With such a large percentage of their populations being members of unions, along with the effectiveness and generosity of public social welfare programs, Sweden and Finland managed to create responsible unions with a stake in the overall competitiveness of their economies. Labor peace and the attendant social contract that goes along with it – rising standards of living for workers - has been key to the success and competitiveness of all these countries.

In this regard, Israel faces important challenges if it is to realize its vision for the future. Israel has done much to rein in the power of the Histadrut already, but it has not succeeded in turning the union into a
Some sort of social stability pact with Israeli labor would help to improve the flexibility and productivity of Israeli labor and improve the competitiveness of the Israeli economy.
Benchmarking Labor Best Practices:

1. **Establish a Social Partnership Agreement** Government must take the lead in promoting harmony and cooperation between labor and business. Flexible labor markets must be combined with social welfare programs to build trust and the overall competitiveness of the economy.

2. **Adapt Denmark's "flexicurity" system.** Denmark's flexicurity system combines a flexible labor market - employers have the right to hire and fire at will and there are few job protections - and a generous and efficient social safety net and active labor market policy that provides unemployed workers with the support and resources necessary to get back on their feet and reenter the labor market.

3. **Build a National Skills Strategy.** Ireland has identified future trends in labor market demand and has adjusted its education priorities and spending accordingly to ensure that graduates will find jobs in the labor market. Israel could do this too, with a special emphasis on helping members of the Arab and Ultra-Orthodox communities gain the skills necessary to join the workforce.

4. **Strengthen vocational education while encouraging higher education.** Any country's competitiveness depends on the human capital of its workers – and not just the scientists and engineers who lead the high-tech sectors of the economy. Sweden has spent a lot of time, energy and money strengthening its vocational schools, universities and research institutes. Degrees or certificates in many vocational programs are highly valued by the private sector, especially in many of the traditional sectors of the economy. University tuition is free and 45% of Swedes who graduate high school go on to higher education.
5. Build a comprehensive system of adult education. Sweden has a very strong adult education system that is very closely tied with its vocational schools. Over one million Swedes have enrolled in adult education programs. These programs target low-skilled or unemployed workers, and 'catch' dropouts who failed to complete high school. In the 1990's, when 10% of all jobs were lost, the Swedish government greatly expanded its investment in adult education programs as a key part of its labor market policy. Israel could use adult education programs to increase its labor force participation rates and make its overall workforce more productive.

6. Leverage centralized wage negotiations as an advantage, rather than liability. Sweden and Finland have two of the world's highest rates of union participation, with the participation rates of between 70% and 80% of the entire work force. High unionization rates ensure that labor is a responsible member of society and concerned with the overall competitiveness of the national economy and not just the parochial interests of a specific company or industry. The result has been that skilled workers earn relatively less than their counterparts elsewhere, which has contributed to their strength as global R&D centers.

Institutions

A hallmark of all of the most competitive countries is clean government, the rule of law, effective institutions, a high quality civil service, and great emphasis on comprehensive planning for economic development.

The first key to Singapore’s success was an extremely aggressive attack on corruption coupled with an affirmation of the rule of law and the elevation of the quality, independence, and pay of the civil service. The second key was the establishment of the EDB and other agencies to plan and execute a comprehensive strategy for economic competitiveness.

Ireland’s civil service is top notch, well paid, recruited by competitive examination, and has a high social status. It is the Irish civil service that on several occasions has pulled the country out of deep crisis. Preeminently behind Ireland’s success stands Forfas and the related panoply of committees, agencies, and institutions it coordinates to develop and carry out Ireland’s comprehensive competitiveness strategy.

In Taiwan, Sweden, Finland, and Estonia, the story is similar. To take the example of Estonia, when it emerged from the Soviet Union it was left with the legacy of a corrupt corps of apparatchiks, a total lack of transparency, and massively inefficient institutions. Thus Estonia’s first priority after gaining independence was to attack the problem of corruption and build effective, transparent institutions that could effectively plan and implement public policies.

With regard to these fundamental elements, Israel has reason for concern as the following charts demonstrate. But more crucially, Israel needs to create the type of professional, non-partisan institutions that can plan and implement public policies effectively.
Control of Corruption - 2005

(Chosen comparator also shown for)

Note: Blue dots represent estimates for the 2005 governance indicators. The thin vertical lines represent standard errors around these estimates for each country in

Source: "Governance Matters V: Governance Indicators for 1996-2005" by Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi.
Government Effectiveness - 2005
(Chosen comparator also shown for selected countries)

Normalized Government Effectiveness Index

HIGH

LOW

Note: Blue dots represent estimates for the 2005 governance indicators. The thin vertical lines represent standard errors around these estimates for each country in world-wide sample. Black dot

Source: "Governance Matters V: Governance Indicators for 1996-2005" by Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi.

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Government Efficiency

Extent to which government policies are conducive to competitiveness

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Benchmarking Institutions Best Practices

1. Create Powerful Economic Development Institutions. Economic development and competitiveness must be a top priority of the government and be led from the highest levels. Ireland’s National Competitiveness Council played a leading role in the transformation of the Irish economy. The council benchmarks the Irish economy annually against competitors and coordinates the key agencies of the government as well as the private sector in developing Ireland’s annual competitiveness plan. Singapore’s Economic Development Board has likewise been given much authority to craft and implement Singapore’s development strategies. In Finland, all of the important development agencies, from Tekes to Sitra and the Academy of Finland, are effectively coordinated by a Cabinet level agency. An important element that all these bodies share is that they provide a space for consultation and cooperation between leading members of the government, academia, the private sector and labor.

2. Create a National Development Plan. Ireland, Singapore and Taiwan all have comprehensive development strategies with clear goals and effective government institutions to implement the plans. Effective plans mix economic policies like tax reforms with education policies, infrastructure investment and social services to ensure that all of a country’s resources are working together to improve competitiveness.

3. Establish an Innovation System. While Israel’s start up and venture capital activities are the envy of many other countries, more could be done to build large, world class companies and spread technology throughout traditional sectors. Finland has successfully integrated its public support of innovation and science and technology into its overall economic development plans.

4. Achieve a consensus on basic policy goals and strategies. Ideally, economic development strategies should be broadly free of partisan politics and all players in the system should agree on the main outlines of policy goals and methods. For the most part, the countries in our study have managed to achieve broad consensus, which has greatly enhance the effectiveness of their development plans. Estonia has been governed by a series of short lived coalition governments, but has managed to maintain consistent strategies and a stable policy environment.

5. De-politicize the bureaucracy. Professional, non-partisan bureaucracies are crucial in the crafting and implementation of economic development policies and in limiting corruption. Estonia, which upon independence inherited a bureaucracy far more corrupt and incompetent than Israel’s, moved quickly to create an efficient, transparent bureaucracy staffed with non-partisan technocrats. Its principal of small government also became an anti-corruption tool, by having fewer and simpler regulations. The Singaporean
state manages to recruit some of the best and brightest by paying high wages competitive with the private sector. Sweden limits the ability of cabinet ministers to make staffing decisions in their respective ministries.

6. Move procedural tasks to the Internet. Estonia has shifted many of its procedural tasks, from filing taxes to registering businesses and paying fees, online. This results in quick and transparent public services that increase efficiencies and limit the opportunities for corruption.

7. Make sure government officials are bound by the rule of law. Singapore, Sweden and Finland simply do not tolerate corruption and hold their public servants to the highest standards of decorum and professionalism. Government leaders set the standard for every other member of society.

Society

An intriguing question raised by our benchmarking study is the extent to which social cohesion and homogeneity contribute to economic success. Israel is far and away the most ethnically and culturally diverse of the countries in our study, and many of the specific challenges faced by the Israeli economy – like its low labor force participation rates and high levels of inequality - are directly related to its diversity.

By the same token, it is an open question whether the generous social welfare programs and low levels of inequality achieved by the Scandinavian states would have been possible in more diverse societies. Given the high levels of immigration into Sweden recently, perhaps this question will be answerable in the future. Nonetheless, social cohesion does seem to be a very important element in economic success. With the exception of Israel, all the countries in our study are characterized by high degrees of trust and consensus on the fundamental values and goals of the state.

This does not mean that the population has to be homogeneous or that important political differences cannot exist. Singapore’s population contains significant ethnic minorities. Yet the country has still managed to forge a strong national identity and achieve a consensus among all of its communities on the key values, policies, and practices that make Singapore work. Sweden, Finland, and Ireland are all countries with strong democratic traditions that have frequent changes of political leadership. But, again, their citizens have strong national identities and a sense of being on the same team even if the captains of the team change from time to time.
Indeed, in recent years challenges to competitiveness have arisen in some of our countries precisely because of incipient breakdowns in social cohesion. Sweden, for example, is facing big questions and divergences of view on how to handle large numbers of immigrants who are very different culturally, ethnically, and religiously from most Swedes. Taiwan is facing enormous problems because of fundamental and growing divisions over how to handle relations with mainland China and over the question of whether its people are “Taiwanese” or “Chinese.”

Israel is a very heterogeneous society that also contains many political divisions. It faces large challenges in finding ways to take advantage of this diversity while also forging unity on basic values, goals, and strategies. While our subject countries do not perhaps provide the best examples of how to overcome ethnic diversity, they do provide a few lessons, and they underscore the importance of getting this issue right.

Benchmarking Society Best Practices:

1. **Discourage segregation and promote integrated communities.** Singapore made great efforts to overcome the ethnic problems that forced its expulsion from the Malaysian state. New housing developments were required to house families in the proportion to the overall ethnic make-up of Singapore. This prevented ethnic ghettos from forming and in the long term reduced ethnic tensions.

2. **Social welfare programs reduce inequalities.** It is no accident that Sweden and Finland have such low levels of inequality and high levels of social cohesion. Free education and health care, generous unemployment and welfare benefits, and strong pensions plans ensure that every member of society is given an equal chance to excel and that no one falls too far below the average.

3. **National service builds strong national identities.** Sweden, Finland and Singapore all have mandatory military or national service programs that help to instill a sense of community and identity among young people.

4. **Guest worker programs are not a good idea.** It is a myth that foreign workers do jobs that domestic workers will not. Rather, they engage in menial labor at much lower wages than locals would accept. Foreign guest workers increase inequality, drive down wages for the less skilled, and misallocate investment into areas that would not otherwise be profitable.

**Macroeconomic Issues**

Responsible fiscal and monetary policies are a prerequisite for economic success, and all of the subject economies in our study have had relatively good macroeconomic performance in recent years. Israel in particular has made great strides and shown a great determination in making structural reforms to bring public spending in line with revenues and reduce debt levels. This is an important accomplishment and Israel deserves praise for its success. But Israel too often compares its performance with its own historical past. Israel’s recent economic successes mean that its peers are now the most highly developed and competitive economies in the world - and the standards are higher in this select group.

So even though recent Israeli growth has been above historical levels, inflation has been brought under control, interest rates are low, the current account is running a modest surplus, investment is strong by past
standards, venture capital and high tech are booming, and things feel pretty good, this is no time to become complacent.

Despite its good performance, Israel remains at the low end of this benchmark group in per capita GDP and in growth of per capital GDP. It remains a relatively low saving, low investment country with a lot of both domestic and foreign debt and high interest payments. Its government shoulders one of the highest levels of public spending as a proportion of GDP, but because of the military burden and the inefficient provision of public services in Israel, the state fails to provide social services at a level commensurate with its European peers. So, while Israel is doing well, it must do still better if it is to realize its vision for the future.
Benchmarking Macroeconomic Best Practices:

1. Current account surpluses are the result of government policies that encourage savings and investment and discourage consumption. All of the countries in our study have followed export led growth strategies and have crafted their tax regimes to promote savings and investment over consumption. High energy taxes and VATs, combined with low corporate taxes are important elements of this strategy.

2. Foreign exchange reserves provide insurance against financial market volatility. Singapore and Taiwan survived the Asian financial crisis of 1997 relatively unscathed, but they took away an important lesson form the aftermath. Singapore’s next door neighbor Indonesia was forced to enter into a humiliating IMF led restructuring program after the collapse of its currency and foreign investment in the country. As a result, many Asian countries decided that it would be better to build up a stockpile of foreign exchange reserves to fend off any financial crises and avoid foreign intervention in their economies. While there are problems with this approach, Israel would do well to consider running current account surpluses as a matter of policy and maintaining a reasonable level of foreign exchange reserves as insurance against future crises.

3. Exchange rates matter. Exchange rates are an important component of any country’s international competitiveness. An overvalued currency will hurt export industries and encourage domestic consumption and imports. All of the countries in our study have traditionally tried to ensure that their currencies do not become overvalued, and many, like Singapore and Taiwan, actively manage their currencies to prevent appreciation. While currency management has its costs, and the Asians in particular are overzealous in their currency manipulations, the Bank of Israel should be cognizant of the impact on Israel’s economic growth and domestic employment rates of a strong currency as it sets its interest rate policy.

4. Over the long run, balanced budgets bring borrowing costs down. Responsible fiscal policies are not an end in their own right, over the long run, they contribute to lower benchmark interest rates, and hence to lower corporate borrowing costs. Sweden and Finland both suffered severe economic recessions that were caused in part by excessive government spending and deteriorating fiscal positions. But after launching major recovery programs and bringing spending under control, both countries were rewarded with sharply lower interest rates that encouraged businesses to borrow and invest in new capacity.
The Vision

Thus far, Israel’s history has been dominated by an epic struggle for national survival. Out of the crucible of the Holocaust, large parts of the Jewish nation began to reassemble in Israel. The young state of Israel faced many existential threats to her survival, including military attacks by her neighbors, perilous finances and many geo-political challenges. But the first generations of Israelis worked together with single-minded determination to build the state of Israel and ensure its continued existence.

This early struggle, which yielded a great sense of national unity and shared sacrifice among Israeli citizens, has now given way to a period of soul-searching and uncertainty. In part, this is a sign of maturity. Countries that are not facing an immediate existential threat to their survival must necessarily focus more on the mundane public policy issues facing all states. But Israel has also become more diverse – not only in terms of ethnicities, cultures, and religious affiliations, but also in terms of goals and visions of the state of Israel.

The breakdown of peace talks with the Palestinians and the difficulties of Israel’s geo-political situation no doubt have contributed to this sense of uncertainty. So too has the rise of globalization, with its rapid pace of technological change and the weakening of job security. But economic policy provides a subject around which Israelis can unite, free from the passions and emotions surrounding security concerns and with an aim to promote the unity and welfare of the entire Israeli populace.

Israel must strive for excellence not only in technological expertise and innovation, but in constantly rising living standards, social justice and equality of opportunity, standards of governance and accountability, and environmental sustainability. Wise public policies that promote the expansion of technical knowledge, managerial expertise, and the ability of the private sector to turn this knowledge into new goods and services, form the core of any modern economic development strategy.

Israel’s long-term survival depends on more than mere military competence; Israel’s edge is dependent on economic strength and social cohesiveness. All Israeli citizens must be given the opportunity and responsibility to contribute to the state, pursue happiness, and achieve their full potential. Only then can Israel become truly secure and truly live up to its potential.

Recommendations

While our benchmarking countries certainly do not share all of the same economic policies, they all get the fundamentals right. A few basic conditions must be met for any successful economy to grow:

1) Macro-Economic Stability: All modern economies require a stable macro economic environment – inflation rates and exchange rates must be kept stable; public budgets must be kept near balance, and the overall debt burden must not be allowed to grow too large. Responsible fiscal and monetary policies are a prerequisite of long term economic growth.

2) Rule of Law: Governments and bureaucracies must be free of corruption. Rules and regulations must be transparent, public services must be administered efficiently, the legal system must protect private property
and other rights, and there must be a system of accountability to hold people responsible for their mistakes and reward successes.

3) **Infrastructure**: Basic infrastructure must be seamless, reliable, essentially taken for granted. Transportation must be efficient and relatively free from congestion; Ports must have adequate capacity, be efficiently run, and be free from labor strife; Telecoms must operate on a particularly advanced and efficient level – ubiquitous high speed internet access is a must, as are wireless services and affordable access; electricity, water and waste services must be invisible and reliable.

**Main Recommendations:**

Apart from the above fundamentals, however, the main attribute that all the countries in our benchmarking study share is that they all have economic development strategies. Although they did not and will not pursue the same types of strategies, they all have developed institutions with the ability and resources to plan and implement economic development strategies that meet the specific needs and challenges their countries face. Political, business and labor leaders in these countries all believe that economic competitiveness is of the utmost importance and attempt to work together to craft comprehensive and effective policies.

As such, the central finding of our study, and the main policy recommendation we have for Israel, revolves around the capacity of the Israeli state to create economic policies that will improve the competitiveness of the Israeli economy. While we do have many specific recommendations for how Israel might learn and borrow from the experiences of the countries in our study, the most important priority is to build the institutional capacity to identify the strengths and weaknesses of the Israeli economy, and take steps to improve the competitiveness of the economy and the well being of Israeli citizens. The following recommendations address this issue and identify several key areas that any Israeli economic development strategy should address.

1. Israel should view its economic competitiveness as a crucial component of its national security. Only by according economic issues the same weight and importance as security considerations can Israel succeed in guaranteeing its continued security and well-being.

2. Establish a National Competitiveness Council chaired by the Prime Minister, and charge this council with completing an annual assessment of the nation’s competitiveness. The Council should include the heads of several key ministries, including Education, Finance, Trade and Infrastructure, as well as senior representatives from labor, academia and the business community.

3. Create an Agency for Economic Development that would have a mandate to promote long-term investment in the Israeli economy with an emphasis on creating jobs, fostering new technologies, improving management practices, and expanding exports. The overarching goal should of course be to improve the overall standard of living in Israel and increase the country’s stock of human capital. But the agency should have the authority to take very specific steps to achieve these goals – it should be able to reform everything from tax codes and business regulations to labor laws and it should be given a budget to support continued investment in R&D, infrastructure and export industries.

4. The Office of the Chief Scientist would be an important element of this agency, but given the success the Chief Scientist has had in promoting high-tech, the role of the Chief Scientist should not be fundamentally altered – it should continue supporting R&D investment as much as possible, and should change its funding priorities only in response to specific needs or goals identified by the Agency for Economic Development.
5. This agency should also be given the responsibility of promoting foreign direct investment in Israel. A special investment service could also be created within the diplomatic corps to promote Israel abroad.

6. Another important mandate the agency should be given is to spread the latest technology and management techniques widely throughout the economy with the express aim of leveraging new technologies and management techniques so low tech industries can improve their efficiency and productivity.

7. Israel should strive to reach an accommodation between labor, management, and government to encourage all of these parties to work together to improve the competitiveness of the Israeli economy and build human capital. Israel must achieve the same kind of labor flexibility and skilled workforce as its leading competitors. Part of the solution here could be modeled on the Danish flexicurity system.

8. Create a required core national curriculum for all primary and secondary schools for all ethnic and religious groups. Emphasize science, math and English language proficiency from an early age. Improve the quality of the schools and ensure that all Israelis have access to a high-quality education that will train them for specific jobs in the labor market.

9. Create a Skills Map modeled on the efforts to chart future labor market demand in Ireland and Singapore and make sure that the education sector is producing graduates with skills that will meet this demand.

10. Require a form of national service from all ethnic and religious groups even if they do not perform military service. Some kind of national service on the part of the Arab and Ultra-Orthodox communities can both build a stronger sense of national identity and address specific needs and problems these communities need to overcome.

11. Maintain the independence of the Bank of Israel, but give it a mandate to manage monetary policy not only for inflation but also for full employment and to maintain a low and stable exchange rate.

12. Expand the tourism industry with an eye to providing employment opportunities for less-skilled workers. Tourism is also an area where the interests of Israelis and Palestinians coincide, and provides an opportunity for the two communities to cooperate and work together.

13. Create an ‘infrastructure czar’ to oversee a comprehensive upgrading of the entire national infrastructure. This should be a Ministerial level position and should include responsibility not just for basic infrastructure like transportation and energy projects, but also telecommunications. Fast, reliable broadband and wireless communications system are a crucial part of the ‘innovation ecosystem’ and an integral part of Israel’s economic competitiveness.

14. Reduce corporate taxes as much as possible. Try not to give special tax breaks to favored industries, but rather try to reform the corporate tax system to make Israel an appealing place to invest compared to other foreign jurisdictions. In this regard, tax rates should not just be lowered, but the tax code should be simplified to reduce the time and effort companies spend filing their taxes and to reduce the opportunities for corruption.

15. Israel needs to leverage the success of its venture capital industry and high-tech start-ups to create large, world class Israeli companies. To this end, Israel should encourage long-term investments by
raising short term capital gains taxes to discourage speculative capital flows but lowering long term capital gains taxes.

16. Small, open economies like Israel's need to carefully manage their current account balances to ensure they have adequate foreign exchange reserves to protect themselves from volatile international capital flows and to maintain independent monetary and fiscal policies. The best way to ensure this is to craft tax policies to promote saving and investment over consumption. Israel should consider imposing consumption levies (like a VAT) and a carbon tax. Revenue from these taxes could offset the loss of revenues from lower corporate taxes. Lower corporate taxes would also increase Israel's national savings rate by improving corporate profitability. For personal taxes, establish a progressive flat tax as in Estonia.

Apart from these fundamentals, many of the specific policies and institutions that our benchmarking countries have adopted are potentially useful for Israel. What follows are specific recommendations for Israel based on our assessment of both the strengths and weaknesses of the Israeli economy, as well as the best practices in public policy and economic development that we saw in our benchmarking countries. We have grouped the recommendations by subject to conform with the work the other committees in the project have done.

**Education**

Israel faces a major challenge both in the quality and the unevenness of its primary and secondary education. Education is the key to improving Israel's low labor force participation rates and long run productivity growth. Some key education policies that Israel could adopt include:

1. Establish a standard core curriculum that all students must complete.

2. Establish a standard number of years of study for all students.

3. Make English a required course of study beginning in the third grade and continuing to school completion with the objective of achieving Scandinavian levels of English speaking capability.

4. Complete a skills map and inventory similar to that of Ireland and Singapore. The skills students learn in school must prepare them for specific positions in the labor market.

5. Coordinate the skills forecast with the study programs of the junior colleges, technical institutes, universities, and other educational institutions. This might include measures like those of Sweden to grant vocational degrees in particular skills rather than just trying to get more students into a college to study anything.

6. Adopt a program of lifelong learning similar to that of Sweden and Finland.

**Infrastructure**

Israel can receive two important benefits from expanding and improving its communications, energy, transportation and water infrastructure. On the one hand, doing so will improve its overall competitiveness.
On the other hand, construction projects and the long-term maintenance and operation of new infrastructure will be a good source of jobs for low to medium skilled Israelis.

1. Create an infrastructure czar as in Ireland to coordinate and oversee development of a complete and integrated infrastructure development plan.

2. Build science parks and special industrial zones with advanced cutting edge infrastructure – with a special emphasis on modern telecommunications and energy infrastructure.

3. Continuously upgrade Israel’s telecommunications infrastructure to ensure that it uses the latest cutting edge technology and reaches as many homes and businesses as possible.

4. Adopt a road control system with congestion pricing like that of Singapore.

5. Build new roads and railways to endure that all destinations within Israel are within two hours reach (or some reasonable period of time) of each other. Both Taiwan and Ireland are striving over the next five years to tightly tie their villages, cities, and metropolitan areas together. Israel could use a similar strategy to ensure that its disadvantaged regions can ‘catch up’ to the rest of the country.

6. Expand and integrate metropolitan public transportation. Emphasize multi-modal transportation nodes that provide connections between commuter rail, subways, light rail, buses, parking lots and bike paths.

7. Development rights near transit stops can be sold both help pay for new transit lines and encourage ‘smart growth’ style urban development. Likewise, zoning rules should discourage sprawl and promote livable neighborhoods.

8. Israel should make greater use of innovative new financial techniques like project finance and structured finance to fund its new infrastructure projects. Design-Build contracts or Build-Own-Operate arrangements can significantly reduce the costs to the Israeli state of paying for new infrastructure, and they can also help Israeli construction companies improve their international competitiveness and familiarity with the latest financing strategies.

9. Modernize port facilities and practices and make them free trade zones as in Taiwan. Indeed, create industrial parks as in Singapore and Ireland at the ports with easy rail and road links to the interior.

10. Emphasize development of desalinization and of water conservation and alternative water collecting systems development. Both Taiwan and Singapore have exemplary projects. Israel already has strong desalinization technologies. Further development would pay multiple benefits in terms of water security, export potential, geo-political flexibility, technology leadership, and job creation.

11. Expand the development of solar energy. Encourage businesses and homeowners to install solar energy equipment by granting tax breaks and compelling energy distribution companies to buy excess production from these installations back into the grid at reasonable prices as is the case in California and Germany. Germany is the world leader in the development and use of this technology and is not even a sunny country. As with desalinization, leadership here would pay Israel multiple dividends.

12. Explore development of domestic shale oil deposits. Estonia has achieved a degree of energy independence by exploiting its shale oil deposits.
13. Develop infrastructure in the context of a ‘greater middle east.’ Israel should have the potential to link up its trade and transportation infrastructure with those of its neighbors in the event of a permanent peace deal.

R&D And High Tech

Although Israel’s high technology sector is outstanding and has been the main driver of its recent economic resurgence, it has an even greater potential in terms of exports, investment in Israel, and job creation. Israeli entrepreneurs seem too focused on quick exits from their start-up companies. Many firms are started, but the reason that Israel’s technology exports are relatively small by international standards is that few firms go forward to become significant producers or service providers in Israel. All too often they choose an M&A deal or an IPO in a foreign financial market. While it would be unwise to restrict the ability of Israeli entrepreneurs to take either of these routes, Israel can take steps to improve the domestic business environment and make domestic growth and expansion more appealing to Israeli businesspeople.

1. Israel needs to get more spillover from its high-technology sectors into its other industries. This could be done by establishing something like the Manufacturing Technology program of the U.S. Department of Defense. Under this project, teams from the MANTECH office identify critical technologies and then work to actively spread them throughout the industrial base. They visit with and spend months in corporate headquarters and factories assuring that new techniques are known and fully adopted. Another example is the U.S. Agricultural Extension Service which has agents in farming communities around the country whose mission is to introduce the latest technology to farmers and help them utilize it in a productive way. Israel could establish a Technology Extension Service that would do the same thing with regard to technology and the Israeli commercial base.

2. As a way of expanding the technology base, Israel should redouble its efforts to attract foreign MNCs to locate R&D facilities in Israel. Singapore has a highly developed institutional capability for finding and attracting FDI in high-technology areas and Israel could create a special investment service within its diplomatic corps or under the auspices of the Economic Development Agency to promote investment in Israel abroad.

3. Attracting long-term investment in Israel would be facilitated by the development of some science and industrial parks like those of Taiwan and Singapore. They could be part of the free trade zones that we have recommended for the ports, and perhaps they could be developed with an eye to promoting clusters of firms with complementary skills and expertise.

4. In the future, it is likely that technological advances and innovative new products and services will be ever more dependent upon cooperation between universities and the private sector. Biotechnology firms, for example, increasingly cluster around universities and hospitals staffed with skilled scientists, researchers and doctors with whom the private sector can collaborate and develop new drugs and medical devices. Israel should consider promoting special industrial zones that cluster similar technological sectors together and encourage cooperation between academia and the private sector.

5. Israel should attempt to expand and deepen its participation in European Union R&D projects and grants. Cooperating with EU scientists and engineers will allow Israel to expand its expertise into areas that the country would not otherwise be able to participate in. It could also deepen Israelis understanding of European consumer markets and promote exports to the EU.
Business Environment

As the various rankings from the IMD and the WEF show, the Israeli business environment is not as flexible or efficient as in many of its peers. This is largely because of problems with the legal, regulatory, labor, and bureaucratic processes.

A major concern of Israeli analysts has been that despite the country’s very dynamic venture and start up activity the payoff is sub-optimal because of a tendency for entrepreneurs to exit the businesses quickly before they grow into big companies and major employers. As such, Israeli exports, job creation, and equity market capitalizations are all lower than they should be.

While there are a variety of reasons for this tendency, one area that Israeli policy makers could make an immediate improvement in is the quality of the domestic regulatory environment.

Some solutions to this problem could be:

1. Model part of the Israeli Economic Development Authority recommended above as a kind of combination of Ireland’s IDA and Enterprise Ireland. The job of this new entity would be both systematically to attract investment from foreign MNCs and to ease the burden on indigenous companies to encourage them to grow domestically.

2. At a minimum, Israel should adopt the extremely transparent and objective bureaucratic and regulatory policies and practices of Estonia and Singapore. The tax code should be as short and simple as possible and the regulatory process needs to be totally transparent and designed with an aim to increase the competitiveness of the economy.

3. As mentioned above, Israel could reform the way it levies capital gains taxes to discourage short-term investment and encourage long term investment.

4. Israel might consider looking at the Swedish corporate governance model or Singapore’s Temasek investment company for techniques that encourage domestic ownership and control of major businesses.

5. Some Israeli analysts believe that Israel is lacking in managerial expertise. Israel could encourage the development of new MBA programs and Business schools in Israel, perhaps through joint partnerships with US and European universities.

6. Taiwan has proven extremely adept at supply chain management. Because of this expertise, even as the country has lost low-skilled jobs to mainland China, Taiwan has still managed to create new jobs and maintain economic growth by specializing in the management of global supply chains. Israel is going to face increasing competition from low-wage countries, and needs to position itself to benefit from this long term effect of globalization. Learning from Taiwan could help Israel take advantage of the opportunities afforded by globalization and could even serve as to promote the peace process as economic ties with its neighbors encourage good bilateral relations.
Increasing labor force participation rates and creating a more flexible labor market that encourages private sector job creation are perhaps the most pressing challenges facing Israeli policy makers. While some of Israel’s problems in this regard – like the preference of the Haredi to remain in Yeshiva and stay out of the workforce – are unique, Israel is also facing many of the same challenges common to all developed economies in this era of globalization. Competition from low wage economies is hurting many of the traditional sectors of the economy, for example, and structural changes are forcing many workers to adjust to new roles and responsibilities. Israel can draw on the experiences of other countries to find solutions to these problems.

1. While Israel has spent much of the past three decades dismantling the power of the Histadrut, powerful labor unions need not be a drag on growth and can in fact play a positive role in improving the competitiveness of the Israeli economy. Labor confederations in Sweden and Finland, for instance, are responsible participants in economic policy making because they represent such a large proportion of the overall workforce. Social Partnership Agreements, that base wage increases on gains in productivity and focus on protecting the worker and not the job, can be very effective in promoting labor harmony and a constructive relationship between labor, business and the government. The malign influence that the Histadrut used to exert on the Israeli economy has been broken, now it needs to find a way to play a positive role.

2. Flexible labor markets are a crucial prerequisite for strong private sector job creation. Denmark’s ‘Flexicurity’ program combines flexible labor markets – employers are free to hire and fire workers as they see fit, with little or no job protection afforded to workers – with generous welfare programs that aim to support unemployed workers with generous but short-lived unemployment insurance and quickly get them back in the labor force through adult education, worker retraining programs, and job placement services. Israel could adopt a similar system.

3. Reducing the impediments to private sector job creation will not succeed in raising labor force participation rates unless there are qualified applicants ready to fill new positions. But many Israelis lack the skills and expertise in demand in the labor market. Ireland’s Skills Map, published in conjunction with its annual competitiveness reports, targets future employment by identifying the sectors most likely to experience growth and shifting educational resources into degree programs that will prepare graduates for those fields. Israel could do the same – anticipating the future needs of the labor market and preparing the students of today to fill the roles of tomorrow.

4. Finally, the Ultra-Orthodox and Israeli Arab sectors need special help and targeted programs to help them become more productive players in the economy. Special vocational training programs and job placement services will help, but the most effective reforms would target the educational systems that serve these populations by ensuring that they better prepare students for the labor market.

Institutions

It is a truism that any economic development program must be crafted to meet the specific strengths and challenges of the country in question. But one of the most fruitful areas for learning from our benchmarking...
comparison is in the area of institutions. While all of the countries in our study have implemented different
development strategies, many of them have come up with strikingly similar institutional frameworks for
planning and implementing these policies. Israel could benefit greatly by adapting some of its peers’
economic development institutions for its own benefit.

1. If Israel is to create its own Economic Development Agency, there are many models and lessons to
be learned from the experiences of the countries in our benchmarking study. Israel should study
closely Ireland’s National Competitiveness Council and Forfas, the planning and coordinating
agency; Finland’s Science and Technology Council and its related committees and institutions; and
Taiwan’s Council on Economic Planning and Development and its related agencies and committees.
These institutions have a host of successful policies that Israel could adapt to its own needs, as well
as failed policies that Israel could avoid.

2. In Ireland, the Annual Competitiveness Report published by Forfas gives policy makers a candid
assessment of the country’s strengths and weaknesses and provides a framework for efforts to
improve the competitiveness of the Irish economy. It provides a comprehensive analysis of Ireland’s
situation and an extensive benchmarking review of Irish performance compared to that of a number
of other important countries. By publishing this document every year Irish economists and policy
makers bring into focus all the critical issues that the country must face and resolve, float policy
proposals and strategies, and gain public support for their plans.

3. Israel must make a concerted attack on corruption. On the one hand, the status, remuneration, and
professionalism of the civil service should be raised to a level commensurate with its responsibilities.
On the other hand, creation of a Counter Corruption Unit (CCU) that would act as a kind of Special
Prosecutor (in U.S. parlance) to root out corruption should be undertaken. This office would be
independent and would have power to investigate, compel testimony, and prosecute cases before an
independent judiciary. Breaches of corruption rules should be put on a par with breaches of national
security in terms of how seriously they are considered and prosecuted.

4. Israel should study and introduce as much of Estonia’s system of bureaucratic rules, procedures, and
systems as possible. (Maybe Israel could even outsource this task to Estonia). Simplifying,
automating, and making completely transparent and predictable the procedures for getting licenses,
enforcing contracts, etc. would go a long way toward improving the effectiveness of Israeli
institutions and improving competitiveness.

Society

Promoting social cohesion and tolerance are complex tasks that are often difficult to deal with. Ultimately,
however, they have to do with integrating the various elements of the nation, building human capital,
working together to achieve common aims, and reducing inequalities in opportunity and circumstances.
Israel needs to recapture the sense of shared struggle and opportunity that characterized the early years of
the country. Israel will be a stronger, more successful country if its citizens agree on the basic vision and
goals they should strive for.

1. At the moment Arab and Ultra-Orthodox Israelis are exempted from military service. They should
be required to participate in some alternative forms of national service. This is partly a matter of
fulfilling the responsibilities of citizenship, but it is also importantly a matter of creating broader ties
within the society and a stronger sense of national identity. This national service could also be a
source of vocational training for the young people involved as well as a mechanism for enhancing
and upgrading the provision of public services to the poorer and more under-privileged segments of society.

2. In countries like Belgium, Singapore, India and Switzerland, English is a neutral language among the various ethnic groups of the country. It could also serve this role in Israel. Thus it might be a good idea to emphasize English language teaching in all primary and secondary schools and also to use English more where it would facilitate easier communication among the various groups of the society.

3. Israel should establish a common core curriculum for all primary and secondary schools. A common curriculum is important not simply because Israel needs to ensure its students are getting training for jobs that exist in the labor market, but because common curriculums foster a shared sense of identity and encourage social cohesion.

4. Medicine is an industry that requires labor from individuals of all skill levels from orderlies to brain surgeons. Efforts could be made to increase scholarship support and to take other measures that would encourage young people from minority groups to enter this profession.

5. Part of the issue here is getting people with modest skills into the work force. One important answer to this puzzle is the tourism industry. It is a large employer. By definition the employees have to be locally based, and they don’t require PhDs to do most of the work. Taiwan, Singapore, Ireland, and Estonia are all pouring massive resources into building up their tourist industries. Of all the tourist destinations in the world, Israel must rank near the top in term of potential. Capitalizing on this should be a matter of the highest priority.

Macroeconomics

On the one hand, Israel’s economic performance in recent years looks good. Growth has been above historical levels, inflation has been brought under control, interest rates are low, the shekel is strong, the current account is running a modest surplus, investment is strong by past standards, venture capital and high tech are booming, and things feel pretty good.

On the other hand, our study shows that within the selected group of benchmark countries, Israel is a lagging performer in many areas. Its growth has been generally slower than that of the others so that in a sense Israel is like a company that is losing market share but feels good because it is growing. Despite its good performance, Israel remains at the low end of this benchmark group in per capita GDP and in growth of per capital GDP. It remains a relatively low saving, low investment country with a low labor force participation rate and a lot of domestic and foreign debt and high interest payments. Its government spends almost like a Scandinavian welfare state but doesn’t provide anything like the same level of services.

Thus, while Israel is doing well, it must do still better if it is to realize its vision for the future. Prudent fiscal and monetary policies are a necessary prerequisite for continued economic growth.

1. Further reduce welfare costs by introducing a comprehensive program of reforms that couple cuts in welfare payments with increased job training, child care, and other assistance aimed at increasing employment and thereby, overall tax revenue.
2. Reduce corporate tax rates as much as possible while also raising short term capital gains tax rates and at the same time reducing long term capital gains taxes.

3. Increase consumption taxes (like a VAT) and impose a carbon tax.

4. Israel must pursue a strategy of export led growth. But such a strategy demands that the shekel not become overvalued. Indeed, it would be better if it were a bit undervalued. This means two things. First, the economy must be managed so as to favor savings and investment over consumption. Second, the Bank of Israel must have an explicit mandate to manage not just for controlling inflation, but also for achieving full employment and maintaining a stable exchange rate.

5. In accord with this, Israel should be cognizant that the currency policies of some Asian countries are complicating matters for Israel’s own export led strategy. It would, therefore, be wise for Israel to attempt to counter these policies in the appropriate international institutions and discussion forums.

**Leverage the EU**

The EU has been exceptionally good for the reform and growth of countries like Ireland and Estonia and even Swedish and Finnish leaders praise the EU contribution to their own recent renaissance. The help comes in several ways. Some of it is in the form of explicit payments such as structural funds and R&D supplements. But other help is in the form of the application of the *acquis communautaire*, the body of law, regulations, and good practices that must be adopted by all EU members.

Israel, of course, cannot yet become an EU member and will not be eligible for structural funds. But it could possibly join the EFTA along with Switzerland, Lichtenstein, Norway, and Iceland. This would enable it to be almost a virtual EU member and to avail itself of most of what the EU offers without being an actual EU member. It would also be advisable for Israel to voluntarily apply the *acquis communautaire* to itself insofar as possible as a way of imposing the discipline of best practices and thereby reforming many of the faults in its government systems and institutions. At a minimum, Israel should adopt EU technical standards wherever possible, both to leverage the business opportunities this will create and reduce the administrative burden on the Israeli civil service.