

## **Israel**

**An analysis of the country's growth  
experience across various indices  
in the 21<sup>st</sup> century.**

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# Contents

<b>1</b>	<b>Objectives</b>	<b>1</b>
<b>2</b>	<b>A brief history</b>	<b>1</b>
<b>3</b>	<b>Growth Trends in the 21<sup>st</sup> Century</b>	<b>2</b>
<b>4</b>	<b>Policy Decisions</b>	<b>4</b>
4.1	Focus on Human Capital . . . . .	4
4.2	Immigration Policies . . . . .	5
4.3	Economic Policies . . . . .	5
4.4	Diplomacy . . . . .	6
4.5	Commitment to Innovation . . . . .	7
<b>5</b>	<b>Israel's emergence as a tech capital</b>	<b>7</b>
5.1	The secret ingredient . . . . .	9
<b>6</b>	<b>Understanding Israel's growth using models</b>	<b>9</b>
6.1	Linear Growth Model . . . . .	10
6.2	The Solow-Neoclassical . . . . .	10
6.3	The Endogenous Growth model . . . . .	11
<b>7</b>	<b>Study of Israel using the endogenous growth model</b>	<b>12</b>
7.1	Cobb-Douglas specification . . . . .	12
7.2	Endogenizing The Technology Factor . . . . .	12
7.3	Discussion . . . . .	14
<b>8</b>	<b>Data analysis</b>	<b>16</b>
<b>9</b>	<b>Conclusion</b>	<b>20</b>
<b>10</b>	<b>References</b>	<b>20</b>
<b>11</b>	<b>Contributions</b>	<b>21</b>

# 1. Objectives

The objective of our project was to analyse the growth trajectory of Israel in the 21<sup>st</sup> century and understand the decision making in terms of policies that played a role in shaping this trajectory. Finally, we discuss several economic models and figure out whether Israel's growth could be explained by any of those models. Following are Israel's growth story:

- Understand the philosophy that drives Israel's decisions as a nation towards growth by looking at its history.
- Analyze Israel's growth across various indices in the 21st century quantitatively, that is, examine Israel's performance in various sectors such as GDP, employment, trade, innovation, technology, etc.
- Connect the various trends we observed above to the policies and decisions that contributed to the aforementioned trends, i.e. conduct a qualitative analysis on the data, and identify sources of growth for the country.
- Explore which economic growth model can best explain Israel's growth (in terms of economy) and provide an in-depth analysis of the growth trends observed.

# 2. A brief history

Israel was born out of the Zionist movement, which was a political movement that emerged in the late 19<sup>th</sup> century, advocating for the establishment of a Jewish homeland in Palestine. Israel became a nation on May 14, 1948, when David Ben-Gurion, the head of the Jewish Agency, declared the establishment of the State of Israel, following the adoption of a resolution by the United Nations General Assembly on November 29, 1947, which recommended the partition of Palestine into two separate states, one for Jews and one for Arabs.

This petition, being unacceptable to the Arab leaders, caused a conflict to brake out immediately after the declaration of Israeli independence. The surrounding Arab countries launched an attack on the newly declared state, which led to a full-scale war known as the 1948 Arab-Israeli War. After several months of fighting, Israel emerged victorious and established itself as an independent state.

The next few decades saw several wars break out between Israel and the surrounding nations due to these tensions, which was further fueled by the cold war, where the Arab nations where aligned with the USSR and USA forged an alliance with Israel in order to contest USSR's influence in the Middle East.

Hence, Israel's diplomacy, alliances with certain nations, have had a huge impact in Israel's growth story. The key takeaway, however, is that Israel as a nation has no option but to grow across all fronts (Economically, Technologically, Military Strength), as it is a matter of survival for the nation, which would cease to exist if it shows complacency, owing to the surrounding hostile nations.

### 3. Growth Trends in the 21<sup>st</sup> Century

When we look at Israel's growth across various indices, and compare them to other economies of the world, we can gain various insights into what factors played to Israel's strengths and evaluate whether its performance across some development indicators has aligned with the goal state in mind while framing policies. This will be discussed in detail in the next section.

When we look at Israel's Rankings across several indices in the year 2000 and compare the same with its position in the year 2023, it is a fair conclusion to draw that it has done a tremendous job in prospering not just economically, but socially, culturally, and technologically as well.

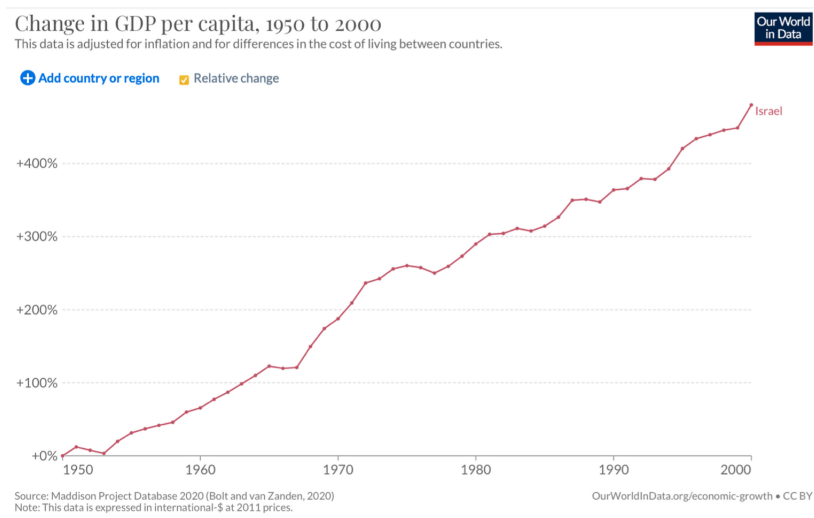


Figure 1: Graph Showing Israel's GDP per capita in the 20<sup>th</sup> century.

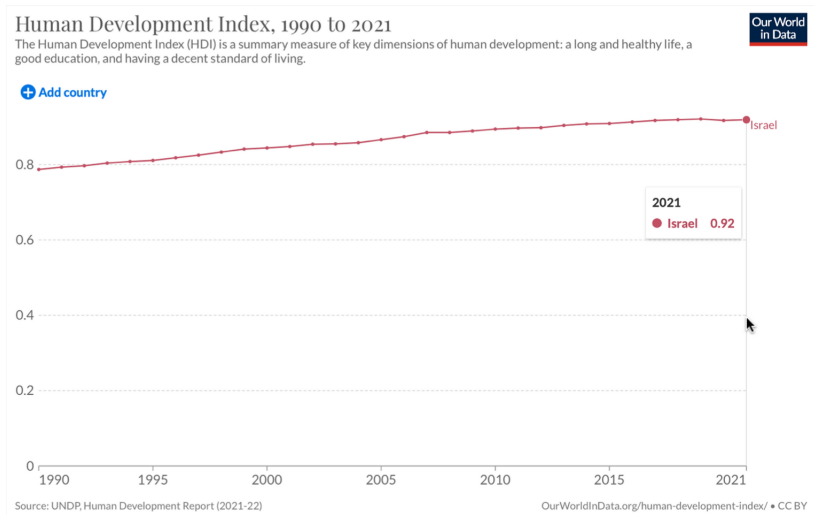


Figure 2: Israel Ranks very high in Human Development Index, which is brought about by economic growth

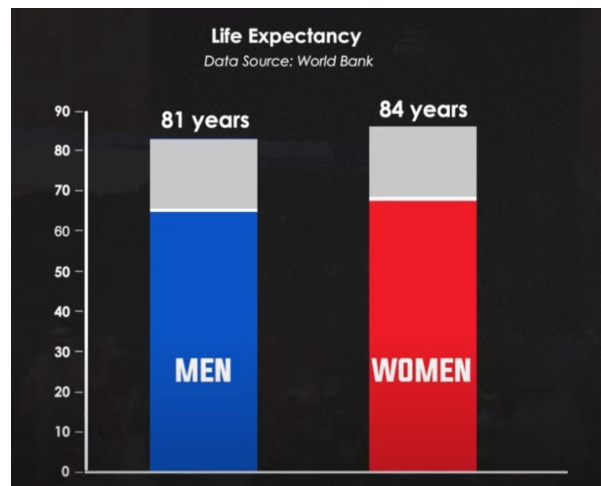


Figure 3: Life expectancy has greatly risen in Israel as compared to mid 1900s, indicating growth

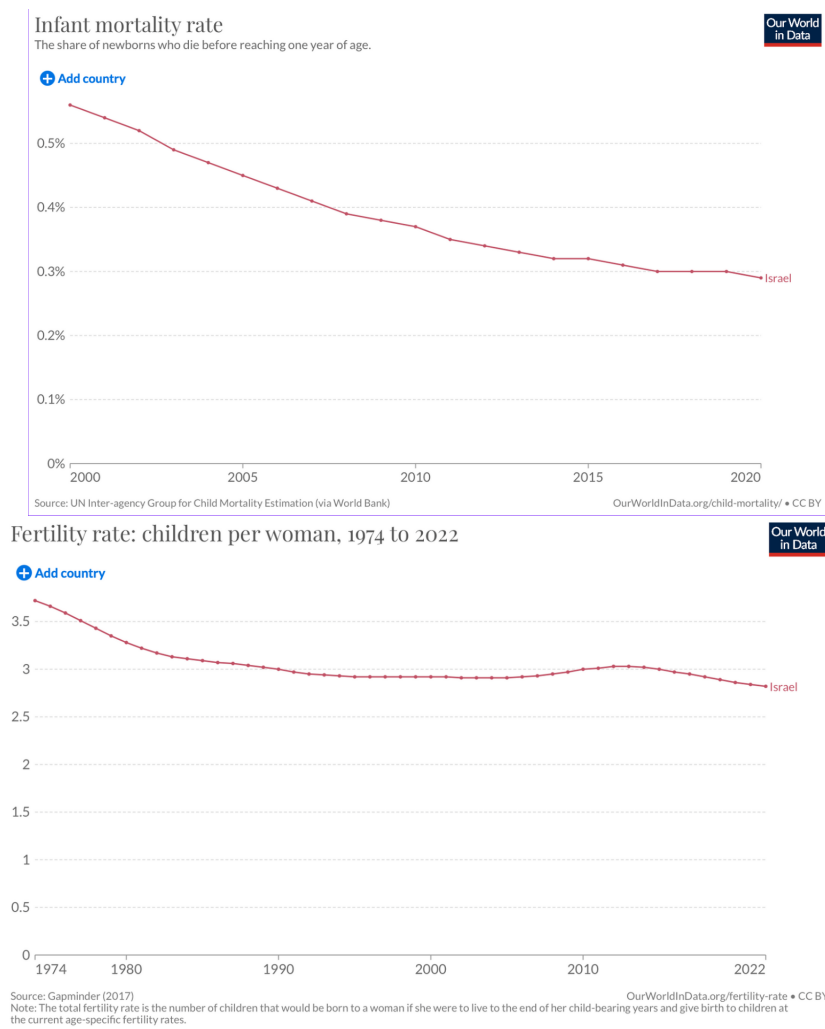


Figure 4: The steep fall in infant mortality rates and fertility rates is yet another indicator of a prosperous economy

Despite being a small country with very little natural resources extensive military spending, it is worthwhile to look at the decision frameworks which helped Israel attain such figures.

## 4. Policy Decisions

When we look at Israel's growth across various indices, and compare them to other economies of the world, we can gain various insights into what factors played to Israel's strengths and evaluate whether its performance across some development indicators has aligned with the goal state in mind while framing policies. Some key factors which lead to Israel's successful and stable economic growth are:

### 4.1 Focus on Human Capital

The Israeli government has consistently invested in education, with educational expenditure accounting for about 8% of the country's GDP. Through extensive grants and scholarships, enrollment in higher education is encouraged and there is a special emphasis in the fields of STEM. Thanks to the human capital and technological expertise arising as a result of this, Israel is now a global leader in several fields including Biotechnology, cybersecurity, and artificial intelligence. Given below is a graph which highlights Israel's focus on the aspect of human capital development in contrast to other nations across the globe.

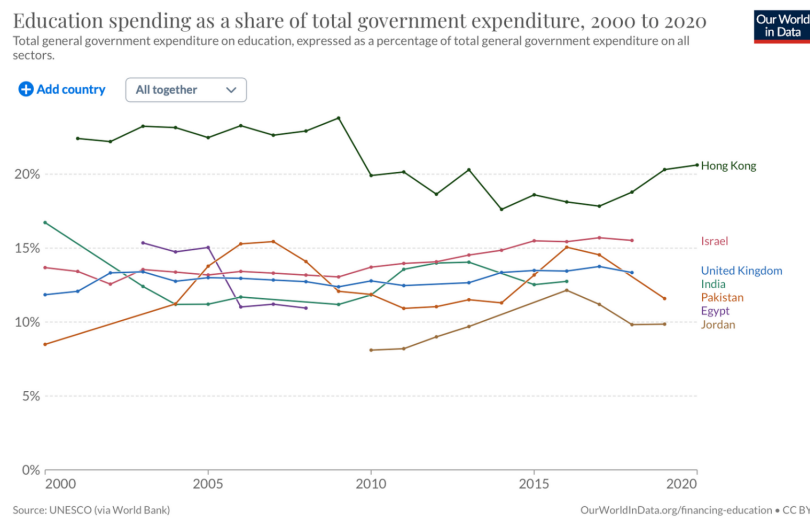


Figure 5: Education Spending as a percentage of total government expenditure across the years.

## 4.2 Immigration Policies

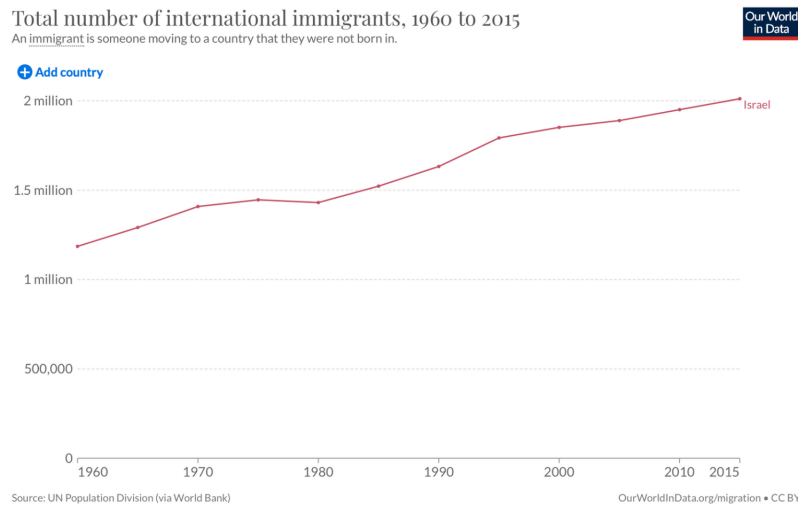


Figure 6: Total number of International Immigrations to Israel across ages.

The lax immigration policies and the high quality of life in the nation encourages the immigration of highly skilled individuals in science, technology, and other fields, which has ultimately helped boost the country's talent pool and contribute to its economic growth.

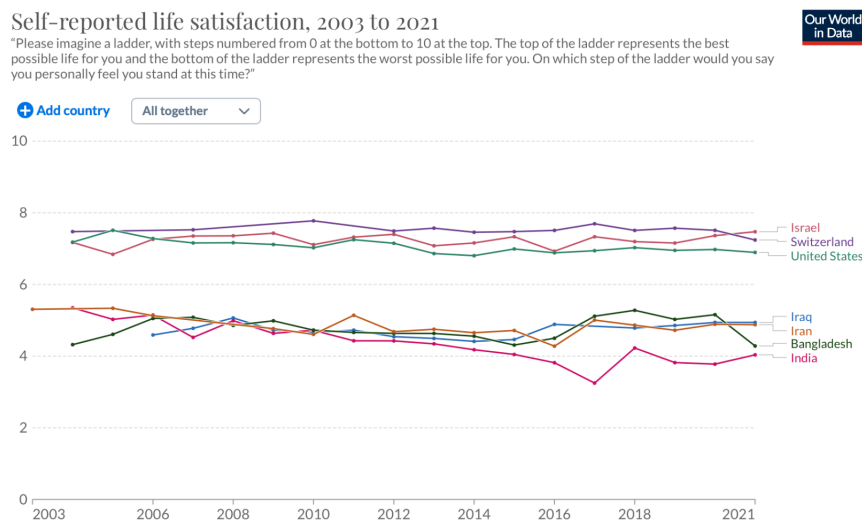


Figure 7: The graph shows how Israel fares in the criteria of Self-Reported life satisfaction amongst several well to do countries. A country ranking high in such an index would prove to be an attractive place for people, attracting talented people to the country.

## 4.3 Economic Policies

Israel has extremely liberal economic policies which has attracted lots of Foreign Investments. Its liberal investment system which is open to both public and private investors has pushed Israel to secure its place as the 12<sup>th</sup> most sought after host countries for

businesses and investors. Some of the key elements of Israel's liberal economic policies include:

1. Privatization: Israel has privatized many state-owned enterprises, such as airlines, banks, and telecommunications companies, in order to increase efficiency and competition in the economy.
2. Deregulation: Israel has reduced regulations on businesses in order to promote entrepreneurship and competition. For example, the country has streamlined the process of starting a business and has reduced the time and cost of obtaining permits and licenses.
3. Free trade: Israel has adopted a policy of free trade, signing numerous free trade agreements with countries around the world. This has helped to increase exports and attract foreign investment.
4. Fiscal discipline: Israel has implemented fiscal discipline, with a focus on reducing public debt and maintaining a balanced budget. The government has also reduced taxes on income, corporate profits, and capital gains.

If we look at an indicator such as the minimum time required to setup a business in countries across the world, we see Israel holding a very favourable position.

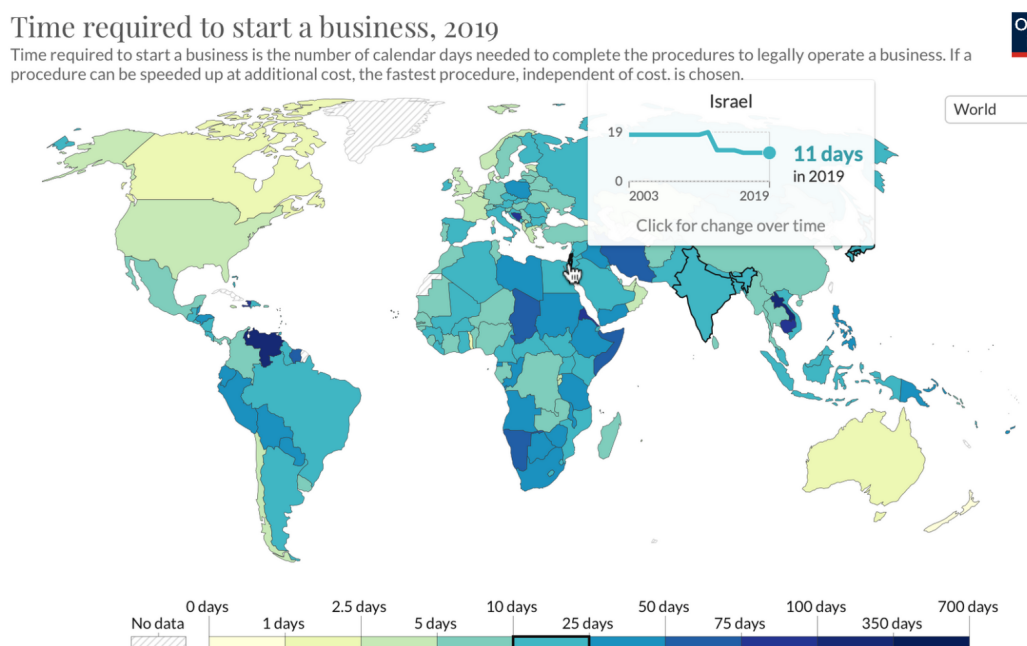


Figure 8: Time required to start a business, as of 2019

## 4.4 Diplomacy

American Aid throughout the 20<sup>th</sup> century, has been an instrumental source of income to Israel which has been an invaluable factor to its military might. It exports technical expertise to various nations across the world, which is a valuable booster to its economy. Its joint weapons development programs with various countries including India speak of its international bringing in key strategic partners and allies along with wealth.



## 4.5 Commitment to Innovation

One of the key policies implemented in Israel to promote entrepreneurial financing is the establishment of a number of government programs that provide funding and support for startups. These programs include grants, subsidies, and tax breaks, as well as venture capital funds that invest in new and innovative companies. This has helped to create a favorable environment for startups and has made it easier for entrepreneurs to access the capital they need to get their businesses off the ground.

Israel has also implemented a cluster model that enables institutions to facilitate the exchange of information and technology by being in close proximity to each other, thereby promoting collaboration and innovation. This model has helped to create an ecosystem of innovation, with companies, research institutions, and other organizations working together to develop new ideas and products.

Another key policy that Israel has implemented to promote industrial innovation is the National Innovation System (NIS) concept. This concept recognizes that innovation is a complex and multifaceted process that requires the coordination and integration of various actors, including companies, universities, research institutions, and government agencies. The NIS approach involves a high amount of resources being devoted towards research and development, as well as policies aimed at promoting collaboration, knowledge sharing, and the commercialization of new ideas and technologies. This has helped to create a supportive environment for innovation and has enabled Israel to become a global leader in a range of high-tech industries. In fact, Israel devotes a significant amount of its GDP towards research and development. The infographic shown below highlights the importance given to research and development by Israel on a global scale.

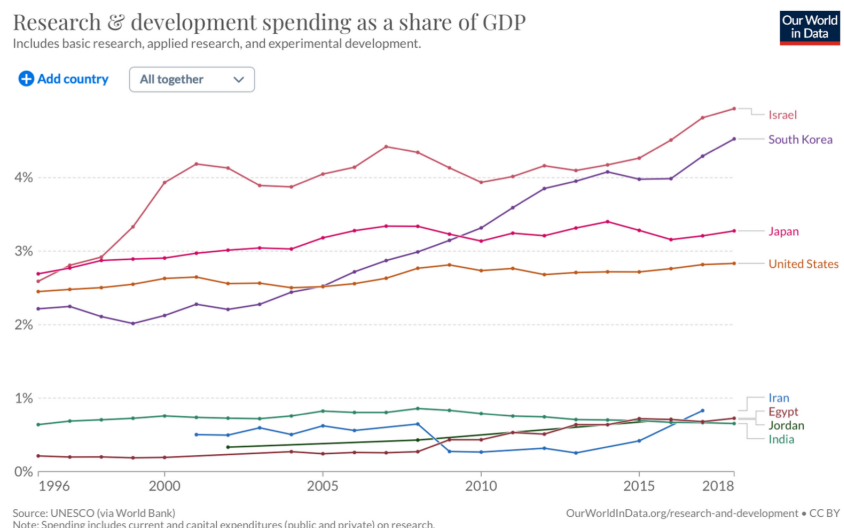


Figure 9: Research and Development spending as a percentage of GDP of Nations

## 5. Israel's emergence as a tech capital

Israel's journey to becoming a tech capital of the world is a remarkable story of perseverance and innovation in the face of adversity. Despite the challenges of war and

internal conflicts, Israel has managed to harness its limited resources and become a global leader in technology. In this section, we will examine the key factors that have contributed to Israel's success in the tech industry, having discussed the policies and growth strategies it had adopted in the previous section.

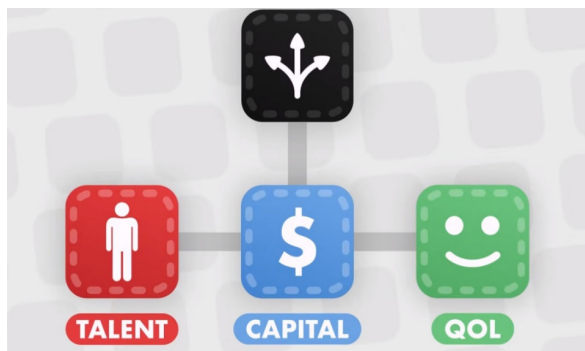


Figure 10: Israel's model to building a tech capital

### 5.0.1 Talent Acquisition

To begin with, Israel has created an environment that fosters and caters to rising talents. This is akin to a restaurant setting up a new outlet somewhere near you and needing talented chefs to attract a large customer base. Due to Israel's small size, it was essentially the perfect environment to foster talented people. The small area dense with talented people created an environment where startup owners lived right next to customers and venture capitalists, all of which helped to create a beautiful environment for startup culture to coalesce. In addition to this, the government has implemented policies to attract talented individuals to the country, such as offering tax incentives for investors and creating research centers to support innovation.

One such policy is the Law of Return, which grants citizenship to all returning Israelis. This policy has been instrumental in attracting skilled individuals from around the world to Israel, further contributing to the country's talent pool. Additionally, Israel places a strong emphasis on STEM education, which has helped to create a highly educated and skilled workforce that is well-equipped to tackle the challenges of the tech industry.

### 5.0.2 Resource management and investments

Having the world's greatest talented chef is still useless without his tools. Similarly, Israel has invested heavily in providing the infrastructure and resources that startups need to succeed. This includes providing access to top-notch research facilities, incubators, and accelerators, as well as creating a supportive regulatory environment that encourages entrepreneurship. They also invest 4.7% of their GDP into RnD. This is second share of GDP invested by any country into RnD in the world, second only to South Korea. Venture capital firms also play a crucial role in funding startups and providing them with the resources they need to grow. Israel has a robust venture capital industry, with firms such as Sequoia Capital and Intel Capital investing heavily in Israeli startups. Furthermore, Israel's focus on military technology has led to the

development of cutting-edge technologies such as drones and cybersecurity. The Israeli army has played a significant role in fostering entrepreneurship by giving soldiers the opportunity to work on innovative projects during their service and providing them with the skills and resources they need to become successful entrepreneurs.

### **5.0.3 Quality of Life**

In addition to attracting talented individuals to Israel, the country has also worked to ensure that people stay in the country. Like a restaurant needing a good environment for its chefs and food, Israel has implemented policies to improve the overall quality of life in the country. For example, the government has invested in improving infrastructure, healthcare, and education, making it an attractive place to live and work. Additionally, Israel's cultural diversity and vibrant social scene have helped to create a welcoming environment for people from all walks of life. It is worth noting that while individuals like Elon Musk may come from other countries, the success of their companies, such as Tesla and SpaceX, is largely due to the supportive environment and resources available in the United States. Israel has taken a similar approach, investing in the resources and infrastructure that are necessary for startups to thrive. By doing so, the country has created an ecosystem that is conducive to innovation and entrepreneurship.

## **5.1 The secret ingredient**

But despite all this, the secret ingredient that truly sets Israel apart is its culture of innovation and risk-taking. In Israel, failure is not seen as a negative thing but rather as a necessary step on the path to success. This mindset has helped to create a culture where people are not afraid to take risks and try new things. This willingness to experiment and push boundaries has led to some of the most innovative and groundbreaking technologies and companies in the world.

Moreover, Israel's unique geopolitical situation has also played a role in fostering a culture of innovation. The constant state of conflict and insecurity has forced Israel to be creative and find new solutions to old problems. As a result, the country has become a hotbed of research and development, with a particular focus on fields like cybersecurity, biotech, and artificial intelligence.

In conclusion, Israel's journey to becoming a tech capital of the world is a testament to the power of smart policies, investment in infrastructure, and a culture of innovation and risk-taking. By creating an ecosystem that is conducive to entrepreneurship and providing the necessary resources and support, Israel has managed to punch above its weight and become a global leader in the tech industry. As other countries look to replicate Israel's success, they would do well to learn from the lessons of this small but mighty nation.

## **6. Understanding Israel's growth using models**

We have seen that Israel is a small, highly advanced, and diversified economy that has experienced strong economic growth since its establishment in 1948. Over the years,

Israel has undergone various structural and economic transformations.

In order to understand the growth of Israel, we can analyze various growth models that have been discussed in class. These models provide a framework for understanding the factors that contribute to economic growth, such as investment in physical and human capital, technological innovation, and institutional factors. By examining these models and comparing them to Israel's economic development, we can gain insights into the factors that have contributed to Israel's growth and identify which model best fits Israel's growth trajectory.

## 6.1 Linear Growth Model

- The linear growth model assumes that the **growth rate of a phenomenon is constant over time**.
- The growth rate of output ( $Y$ ) is a function of the growth rate of the exogenous factor ( $X$ ) and the economy's share of capital ( $K$ ) where  $dY/dt = \alpha XK$

**Does linear growth model fit Israel?**

- The linear growth model is not realistic for long-term growth. It does not account for diminishing returns to capital or the effect of population growth on the economy. Israel's population growth rate has been relatively high compared to other developed countries, which puts pressure on its resources and infrastructure. Therefore, it is necessary to use a growth model that considers the impact of population growth on economic growth and the diminishing returns to capital. Hence **this model cannot be used to study Israel**.

## 6.2 The Solow-Neoclassical

- The Solow model assumes that economic growth can be achieved through an increase in any or both of these factors: **labor and capital**.
- The aggregate production function,  $Y = F(K, L)$  is assumed characterized by constant returns to scale, hence, if all inputs are increased by the same amount then the output will increase by the same amount,  $\alpha Y = F(\alpha K, \alpha L)$

**Does Solow model fit Israel?**

- While the Solow model can provide some insight into Israel's growth, the model assumes a closed economy and does not account for factors such as institutions, and technological innovations, which are a central aspect of Israel's growth. Another aspect is that the model does not incorporate the technical skills people gain with time, which is another key aspect Israel has focused its efforts on. Hence, the **Solow model does not fit Israel**.

While the Solow model provides a useful framework for understanding economic growth, it does not account for several key factors such as institutions and technological innovations, which are central to Israel's growth story as evident from the figure. Additionally, the Solow model does not capture the importance of technical skills that

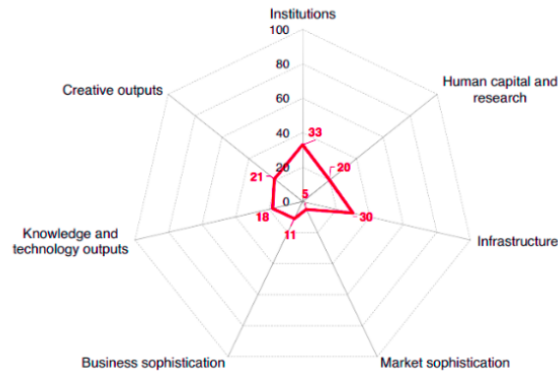


Figure 11: Israel's scores(0-100) for each individual pillar of innovation in the 21st century.

people acquire over time, which are critical for sectors such as institutions and creative output that are crucial for Israel's economy.

The figure clearly indicates that Israel's economic growth is largely driven by several high-technology manufacturing sectors and services, which underscores the need to consider endogenous factors when analyzing Israel's growth.

Therefore, to fully understand Israel's growth trajectory, it is necessary to consider the role of endogenous factors such as human capital, institutions, and technological innovations. By doing so, we can gain a more nuanced understanding of the drivers of Israel's economic growth and the policies and strategies that have contributed to its success.

### 6.3 The Endogenous Growth model

- Endogenous growth model suggests that **technological progress and innovation are key drivers** of economic growth. It emphasizes the role of innovation, technology, education, and research and development in promoting economic growth.
- It also gives significant importance to factors such as knowledge and human capital in driving economic growth, rather than just physical capital and labor force.

#### Does the Endogenous Growth Model fit Israel?

- On the analysis of different growth trends, we have seen that Israel has experienced sustained long-term economic growth since the 1990s with the country's investment in research and development, innovation, and education. The country has a highly educated workforce and invests heavily in high-tech industries. Israel's investments in education, health, defense, and technology align well with the Endogenous Growth Model. These investments have focused on developing human capital and knowledge-based industries, leading to spillover effects and further innovation and growth in other sectors of the economy. Israel has successfully leveraged these factors to drive economic growth, which **aligns with**

the key principles of the Endogenous Growth Model.

## 7. Study of Israel using the endogenous growth model

### 7.1 Cobb-Douglas specification

The link between inputs (such labour and capital) and outputs (like GDP) is modelled by the Cobb-Douglas production function, which is widely used in economics. The usual Cobb-Douglas production function can be expressed as follows:

$$Y_t = AK_t^a L_t^b, \quad 0 < a < 1, 0 < b < 1,$$

Where  $Y$  is the output,  $K$  is capital,  $L$  is labor,  $A$  is a technology factor, and  $a$  and  $b$  are constants that represent the share of output attributable to capital and labor, respectively.

The convergence hypothesis implied by the model can be revisited by deriving the rate of return ( $r$ ) as the difference between marginal product and the depreciation rate ( $d$ ). The MPK (marginal product of capital) represents the additional output that is generated by an additional unit of capital, while the depreciation rate represents the amount by which the capital stock decreases due to wear and tear or obsolescence.

The rate of return ( $r$ ) can be derived as:

$$\begin{aligned} r &= MPK - d \\ r &= aAK_t^{a-1}L_t^b - d. \end{aligned}$$

To maintain  $r$  at a constant level when the growth rate of labour is exogenously provided as  $n$ , the following condition must be met:

$$(dK/dt)/K = bn(1 - a)$$

- which implies the steady state growth rate of capital stocks.
- If capital stocks are low relative to the population and, therefore, a higher rate of return prevails, then the growth rate of capital will be higher
- As capital is accumulated, the rate of return will fall to the steady state level.
- In short, a developing economy with lower per capita capital stocks is expected to grow faster and to “converge” to the steady state achieved by advanced economies

### 7.2 Endogenizing The Technology Factor

In the new growth theory, technology is endogenously determined through the accumulation of human capital. This means that the level of technology depends on the amount of human capital in the economy, which in turn depends on investment in education and training. The first models of this theory, developed by Lucas (1988), Stokey (1991), and Tamura (1991), show that increasing the investment in human capital can lead to sustained economic growth by increasing the productivity of labor and

the level of technological progress. In this framework, technological change is not a result of exogenous factors but is endogenously determined by the investment in human capital.

$$A_t = BH_t^c, \quad 0 < c < 1,$$

where  $H_t$  is the level of human capital stocks

$$dA_t/dt = cBH_t^{c-1}dH_t/dt$$

Therefore, if  $H_t$  increases by 1 percent,  $A_t$  is assumed to increase by  $c$  percent. To incorporate human capital in the model, we can assume that labor input is divided between physical output production and human capital production, with  $xL$  allocated to physical output and  $(1 - x)L$  allocated to human capital. Therefore, the production function can be redefined as:

$$Y_t = BK_t^a H_t^c (xL_t)^b.$$

According to this theory, endogenous growth is feasible as long as continuous investments are made in human capital, even if it continues to accumulate. In other words, models of this kind introduce the crucial assumption that there is no diminishing returns in the production of human capital. The human capital production function takes the following form, which reflects the following assumption:

$$\begin{aligned} dH/dt &= j(1 - x)L_t(H_t/L_t) \\ &= j(1 - x)H_t \end{aligned}$$

where  $(1 - x)L$  is the labor input into the production of human capital and  $j$  is a productivity parameter. In addition, the productivity in human capital production is assumed to be proportional to the level of per capita human capital stocks  $(H_t/L_t)$  at time  $t$ .

#### **Why we can assume this to be true for Israel**

- Human capital includes skills, knowledge, and education, and is an important factor in economic growth.
- In the case of Israel, the human capital accumulation equation could capture the constant investment in education and training, which is a key priority for the country's economy.

#### **Fitting the following model**

Taking the log of the Production function

$$\log Y_t = \text{constant} + a \log K_t + c \log H_t + b \log(xL_t) + u_t$$

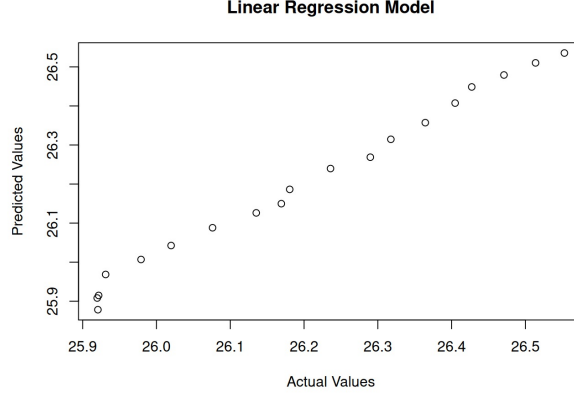


Figure 12: We can see actual values and predicted values match

Taking GDP as  $Y_t$ , Total Spendings as  $K_t$ , Total workforce as  $L$  and Spendings in Education and Training  $H_t$  Trying to fit the model

### 7.3 Discussion

We will examine Israel's performance in areas such as innovation, technology, education, research and development based on its investment trends. These factors are the key drivers of the economy. We have analyzed Israel's economic growth by observing the trends of various indices in the previous sections. We will further look into these trends to evaluate the extent to which these factors have contributed to the country's economic growth.

The endogenous growth model highlights the importance of investing in areas that aim to improve the quality of human life for accumulating human capital. By exploring these growth trends, we can gain insights into how well the Endogenous Growth Model aligns with Israel's economic development.

From the figure, we see that in recent years, Israel has continued to invest heavily in education, health, defense, and technology. This strategic investment in human capital and knowledge-based industries has been a key driver of economic growth, aligning well with the Endogenous Growth Model. Its investments in defense and aerospace industries have also created new technologies that have become the foundation for the country's high-tech industries. The Endogenous Growth Model highlights the importance of spillover effects, which occur when knowledge and ideas generated in one sector or industry spread to other sectors and industries. Investment in technology and research and development has led to the generation of spillover effects. These strategic investments in key sectors make the Endogenous Growth Model a suitable fit for the country's economic growth and development.

Israel has seen a significant increase in employment in human capital accumulation industries such as education, healthcare, and social work, which aligns well with the principles of the Endogenous Growth Model. Employment trends are observed in



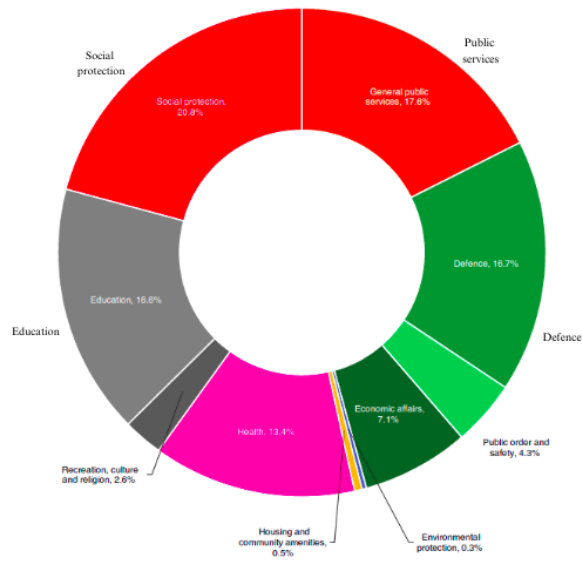


Figure 13: Structure of central government expenditures, 2013. Source: OECD

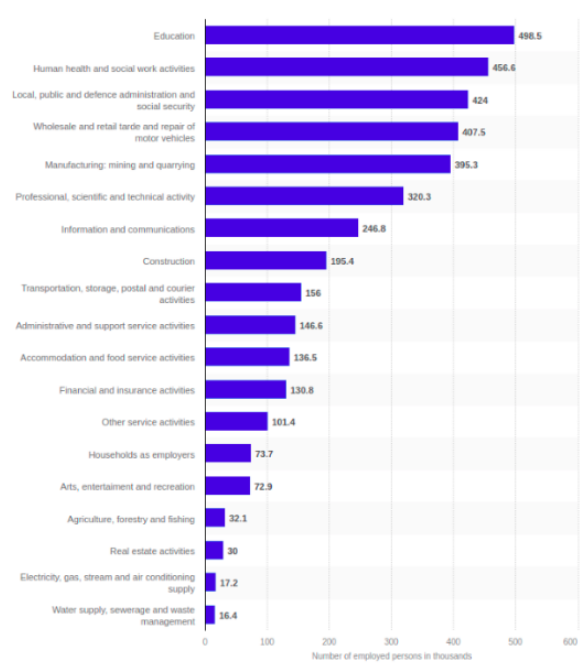
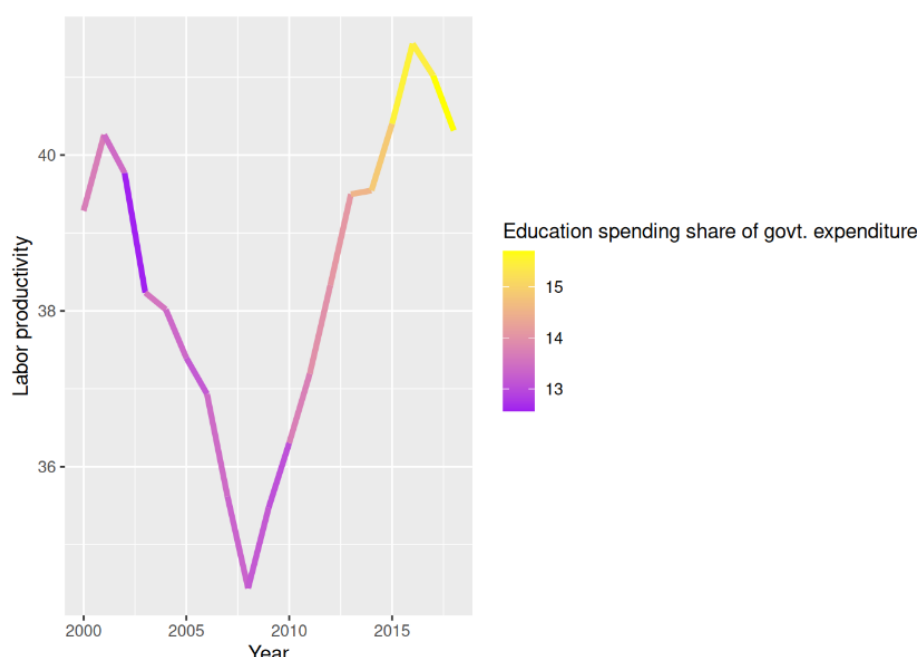


Figure 14: Employment trends in different industries in 21st century. Source: OECD

the figure. By increasing employment in these industries, Israel has not only provided more jobs for its citizens but has also focused on developing its human capital, which can lead to higher productivity, increased innovation, and ultimately, economic growth. Furthermore, the growth of these industries can generate spillover effects, as the knowledge and skills developed in these sectors can transfer to other industries and promote growth in those areas. For example, improvements in education and healthcare can lead to a more skilled and healthier workforce, which can benefit other sectors of the economy. Therefore, the increase in employment in human capital accumulation industries is a clear indication of Israel's investment in human capital, which is a key component of the Endogenous Growth Model. By investing in human capital, Israel is likely to experience sustained economic growth and development in the long run.

## 8. Data analysis

Using the data freely available for all [OurWorldInData](#), we visualized the data and came across several interesting inferences.



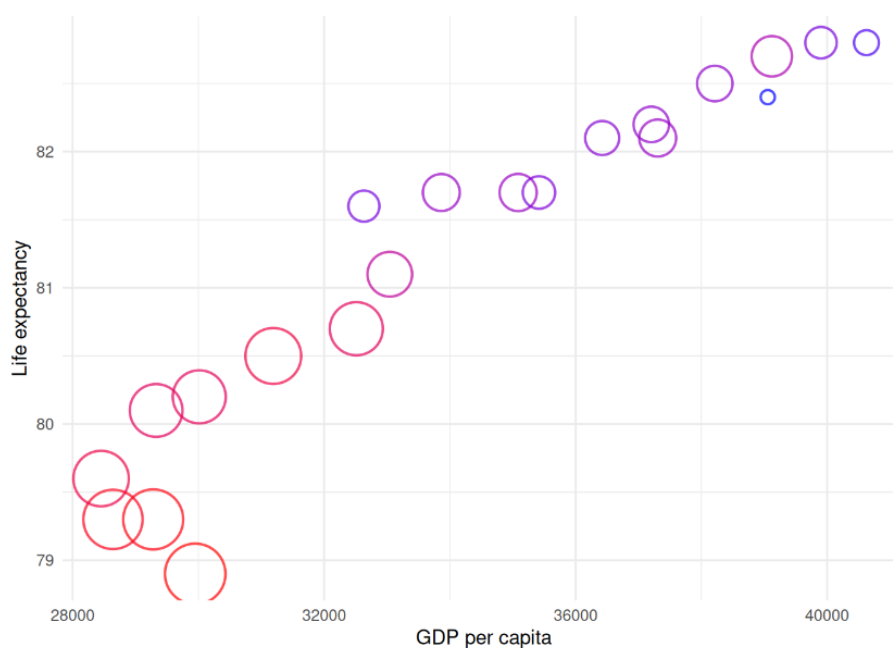
The trend seen in the plot of labor productivity vs education in government expenditure vs year in Israel can be attributed to a number of factors. Firstly, it is important to note that there is a strong correlation between education and productivity, with higher levels of education generally leading to higher levels of productivity.

In 2005, Israel's labor productivity was high, which could be attributed to a number of factors, including strong economic growth and investment in key industries like high-tech. However, as education spending went down in the following years, there may have been a corresponding decrease in human capital development, which could have led to a decline in productivity.

On the other hand, the increase in education spending in recent years may have contributed to the rise in labor productivity. This increase in spending may have led to improved access to education and training programs, as well as increased funding for research and development, all of which can lead to a more highly skilled and productive workforce.

It is also worth noting that the fluctuations in education spending may be linked to broader economic trends and government priorities. For example, during periods of economic downturn or political instability, there may be pressure to cut spending on education in order to reduce the budget deficit or allocate resources to other areas. Conversely, during times of economic growth or political stability, there may be greater willingness to invest in education as a means of fostering long-term economic development.

Overall, the trend seen in the plot of labor productivity vs education in government expenditure vs year in Israel highlights the important role that education plays in driving productivity and economic growth, as well as the need for sustained investment in human capital development.



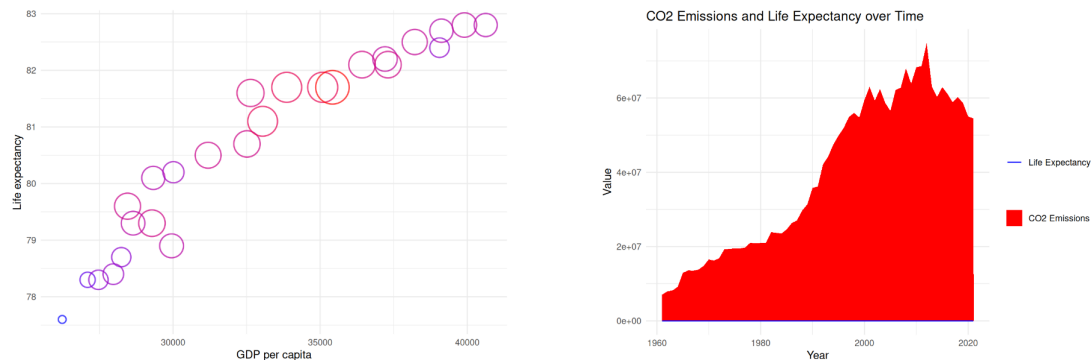
The life expectancy vs GDP per capita vs government share of GDP graph in Israel provides an interesting perspective on the relationship between economic development, public policy, and health outcomes.

At lower levels of GDP per capita, we see that life expectancy was generally lower, while the government share of GDP was relatively high. This is likely due to the fact that at this stage of development, the government plays a larger role in providing basic services like healthcare, education, and social welfare, which can have a positive impact on health outcomes.

As GDP per capita increases, we see a corresponding increase in life expectancy, which could be attributed to a number of factors, including increased access to health-

care, improved living conditions, and better nutrition. At the same time, we see a decrease in the government share of GDP, which suggests that as countries become more economically developed, they are able to rely more on private sector investment and individual initiative to drive growth and improve living standards.

Overall, the life expectancy vs GDP per capita vs government share of GDP graph in Israel highlights the importance of public policy in promoting health and wellbeing, particularly in the early stages of development, and the potential benefits of sustained economic growth and private sector investment in driving improvements in living standards.



The GDP per capita vs life expectancy vs annual CO2 emissions graph in Israel shows an interesting relationship between economic development, environmental impact, and public health.

At low levels of GDP per capita and life expectancy, we see that annual CO2 emissions were relatively low, which suggests that environmental concerns were not a high priority for the country at that stage of development. This may be due to the fact that the primary focus was on meeting basic needs and driving economic growth, rather than on environmental protection.

As GDP per capita and life expectancy increase, we see a corresponding increase in annual CO2 emissions, which suggests that as countries become more economically developed, they tend to rely more on energy-intensive industries and consumer lifestyles that contribute to higher levels of greenhouse gas emissions.

Israel has made significant progress in recent years towards sustainable economic development. The country has implemented various policies and programs to promote clean energy, energy efficiency, and environmental protection. For instance, Israel has a national program for energy conservation, which includes a range of measures such as financial incentives for energy efficiency projects and public education campaigns.

In addition, Israel has been at the forefront of clean energy innovation, with a number of startups and research institutions focused on developing new technologies for renewable energy generation, energy storage, and carbon capture and utilization. For example, the Weizmann Institute of Science in Israel has developed a process for converting carbon dioxide into fuel using renewable energy sources.

Furthermore, Israel has taken steps to promote public health and environmental sustainability, such as investing in public transportation infrastructure and promoting

sustainable urban planning. The country has also implemented policies to reduce greenhouse gas emissions, including a carbon tax and a national plan to reduce emissions by 25% by 2030.

The GDP per capita vs life expectancy vs annual CO2 emissions graph in Israel reflects the impact of these policies and programs. As the country has achieved higher levels of economic development and increased life expectancy, it has also taken steps to reduce its environmental impact and promote sustainability. This demonstrates that economic growth and environmental sustainability can be pursued together, and that it is possible to create a prosperous and healthy society while protecting the planet for future generations.

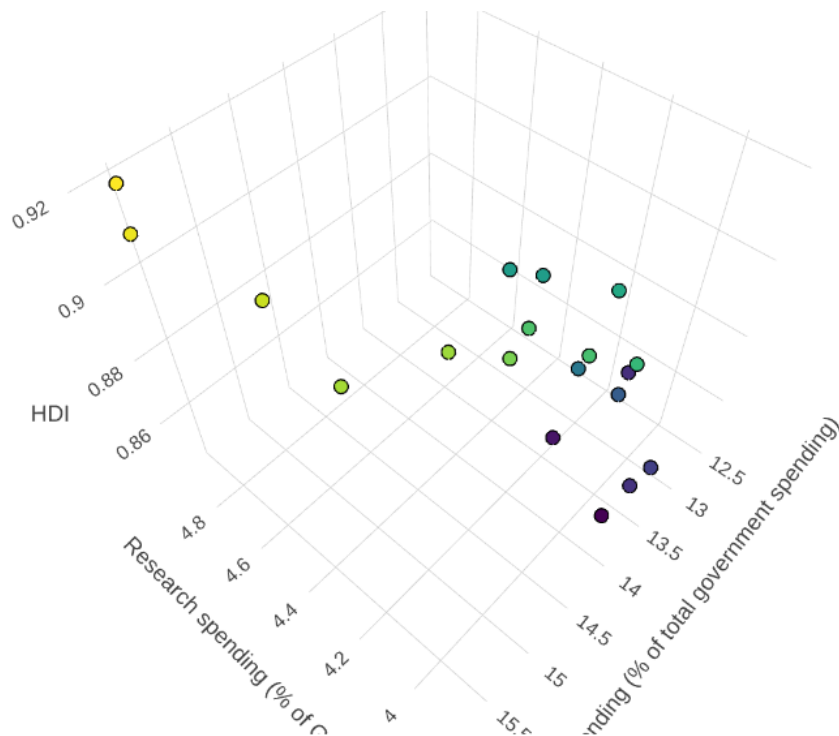


Figure 15: HDI vs Education spending (% of total govt. spending) vs Research spending (% of total govt. spending)

The HDI vs Education spending vs Research spending graph in Israel illustrates the importance of investing in both education and research to achieve higher human development. The graph shows that at lower levels of education and research spending, the HDI is very poor. However, as both education and research spending increase, the HDI also increases and reaches its highest point at higher levels of both.

Israel has implemented various programs to invest in education and research to improve the country's HDI. For example, the Israeli government launched the National Program for Excellence in Science, aimed at increasing the country's scientific research capabilities. This program led to the establishment of several research institutions, including the Israel Science Foundation, which funds scientific research in the country.

Additionally, the Israeli government has made significant investments in edu-

cation, with education spending accounting for a significant percentage of the total government spending. For example, in 2021, the Israeli government approved a budget of over 74 billion shekels for education, accounting for over 20% of the total government spending.

However, the graph also highlights that increasing research spending alone has a minimal effect on HDI. This suggests that while research is essential, it needs to be complemented by a strong focus on education to achieve significant improvements in human development. In Israel, the government has recognized the importance of education and research working together, with initiatives like the Innovation Authority, which aims to promote both education and research in the country to drive economic growth and improve the country's HDI.

## 9. Conclusion

We successfully understood the motivation and philosophy behind Israel's growth decisions. Through both qualitative and quantitative data analysis of various elements relating to the growth and development indicators, we were able to gain an in depth understanding of the sources of economic growth of the nation and the policies that were instrumental to the same. We were also able to establish how various computational tools are extremely effective to gain insights about how various factors correlate and help us arrive at meaningful inferences and explanations of real life phenomenon. Finally, we learnt about various economic models and came up with an explanation as to why the other models fail in comparison to the endogenous growth model to explain the growth of Israel.

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## 11. Contributions

Even though all the members were involved in contributing to every section of this project. Every section was spearheaded by one team member. Following is contribution of each member of the team in terms of playing a key role in the corresponding section of the project:

- Dhruv Hirpara: Explaining the Mathematical Models and proofs behind growth models and using them to explain Israel’s growth in a mathematical sense, Data Analysis
- Hariharan Kalimuthu: Understanding the History and Context of Israel’s growth, Studying and analyzing growth patterns of Israel, and associating them with policy decisions.
- Kishore Kumar: Driving meaningful insights from data analysis using correlational analysis and visualizing the vast amounts of data collected, Explaining the key factors behind Israel’s emergence as a tech capital of the world.
- Srujana Vanka: Explaining various economic growth models, analyzing growth trends, and explaining how these trends fit the growth models to study the growth of Israel.