

Understanding Innovation Clusters

An Exploratory Study of Israel and Southern Sweden

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This article is an excerpt from a Master Thesis conducted at the Faculty of Engineering, Lund University during the spring of 2013. The thesis was done in collaboration between the author, academia and a host company, PwC, in order to gain insights from different perspectives on the innovation systems and clusters.

Josef Schumpeter, 1934, was one of the first to acknowledge innovation as the driving force behind economic growth. Today people look to innovation hot spots such as Silicon Valley in California to find out more about this invisible, though so powerful force in driving economic growth, called innovation. In 1990 Porter wrote his article on *The Competitive Advantage of Nations*, where he argues “A nation’s competitiveness depends on the capacity of its industry to innovate and upgrade”.¹ A latter scholar, Richard Florida, 2001, described in his book *The Flight of the Creative Class* how the economy today is fuelled by creativity, as opposed to fuelled by raw material as it was during and the industrial age. He means that creativity is important because it is what creates economic growth through innovations. Innovative clusters are often said to drive economic growth, no wonder politicians and business leaders want innovation to happen in their region or organization. In order to better understand what makes a region innovative the thesis explored the creative and innovative milieu in Silicon Wadi in Israel.

Israel is an innovation hot spot in the Middle East and an interesting entrepreneurial nation. Venture Capital investments per capita are 2.5 times that in the US and 30 times that of Europe. Israel, the size of New Jersey, with a population of 7.1 million attracts more venture capital than the population of 145 million in Great Britain, France and Germany combined. Besides the US, Israel has the most companies listed on Nasdaq².

Why is Israel so successful when it comes to building a well performing innovation cluster? Is the Israeli entrepreneurial movement one of its kind or are there factors that can be replicated and strategies to implement in other parts of the world?

This article is an excerpt of a thesis aimed at exploring and understanding some of the success factors and drivers behind the Israeli economic miracle. The findings were then applied to take on the challenges identified in the emerging innovation cluster in Southern Sweden.

¹ Michael E. Porter, *The Competitive Advantage of Nations*, Harvard Business Review, 1990, p. 73

² Irwin Steltzer, *The rest of the world can learn a lot from the Israeli formula for growth*, The Wall Street Journal. 2010-01-24.

Purpose

The main purpose of the explorative master thesis was to describe, explain and understand the main success factors that lie behind the regional innovation system in Silicon Wadi in Israel. This was done in order to suggest some tentative ideas on how to further develop the emerging ICT cluster in Malmö/Lund.

Four sub purposes were also applied in order to achieve the main purpose:

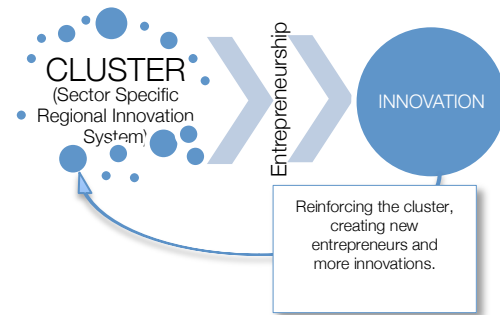
- To understand why Silicon Wadi in Israel has become such a successful and sustainable ICT cluster
- To benchmark the cluster in Silicon Wadi and the one in Malmö Lund: Which are (or seems to be) the key similarities and differences between Silicon Wadi in Israel and the Malmö/Lund region?
- To use the benchmarking to propose ideas on how to address some of the challenges that faces Malmo/Lund as a regional innovation system
- To develop a theoretical framework for exploring and comparing regional innovation systems.

Theoretical Framework

The main theoretical fields that was examined in the thesis was:

- Systems of Innovation
- Clusters
- Innovation
- Entrepreneurship

In the thesis a cluster was defined as a regional and sector specific System of Innovation, SI, in which entrepreneurial activity creates innovations.

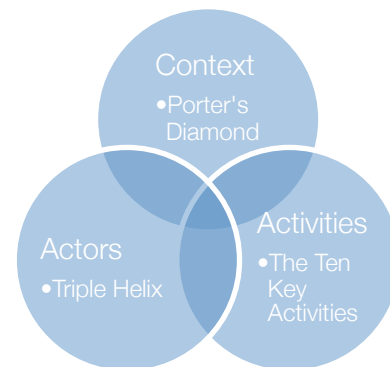


The figure is a visualization of the flows in a cluster and an attempt to show the relations between the terms systems of innovation, cluster, innovation and entrepreneurship and the ecosystem-like structure of an innovation system.

Research Design

The method that was used in the study was primarily case studies since it is a method well suited in exploratory studies. Both qualitative and quantitative data were collected, but there was a focus on qualitative data. Two case studies were conducted in the thesis, one on Silicon Wadi and one on Malmö/Lund. The two case studies were then compared to each other.

The Innovation Ecosystem Model



In order to analyze and being able to compare the two different innovation clusters in the study, a framework called the *Innovation Ecosystem Model* was developed and applied. The model describes and explains innovative clusters through three lenses.

- Context – that is describing the context in which the cluster exists. Porter's diamond is the framework used to map the Context.
- Actors – that is describing the main actors, or stakeholders, in a cluster. Sorted into three main groups according to the Triple Helix model: Academia, State and Industry.
- Activities – that is mapping and describing the different activities being carried out by the actors in the innovation system. To map the activities Charles Edquist's framework "The Ten Key Activities" has been applied.

The model was applied in a number of steps in the thesis as shown in the model on the last page of the article.

Main Findings

Success Factors in Silicon Wadi

Focused Government activities

The Israeli government has been rather active when it comes to public policy on innovation. To a high degree, the initiatives have had a clear purpose, a clear strategy, and distinct goals. The Office of the Chief Scientist, OCS, has functioned as a "one-stop-shop" when it comes to innovation and R&D and it still plays an instrumental role in the innovation system.

Well Developed Capital Markets

The Yozma program initiated in 1993 sparked the VC industry in Israel with its co-founding scheme for private investors and the Israeli state. From a bank monopoly during the 80's the country now have around 70 VC funds with offices in Israel. Above this, 220 international funds are actively seeking investment opportunities in the country. Nevertheless, this steady stream of capital would not have been possible without a well-functioning R&D and education system in the country, bringing ideas

and inventions, the raw material, into the innovation process.

Commercialization Infrastructure

The main organizations in the infrastructure are Technology Transfer Offices at the universities and incubators spread over the entire country. The incubators in Israel functions like seed funds, investing in all the companies they accept in their programs. The incubators and the TTO's have created a clear path for companies in the seed stage and provide capital, physical office space, and advice on the way of development towards a more mature company.

R&D and Education

With the early realization that knowledge was to be the main asset for Israel, the government has been investing heavily in R&D and education. In 2010 Israel was the country with the highest public spending on R&D, 4,25 %, according to OECD. Add to this the investments being made from multinationals into their research facilities in Israel and the military R&D.

Military

The military service is a very specific factor influencing the Israeli innovation system. Besides teaching young people technology and leadership it also creates a nationwide dense network between the people in Israel.

The military culture is reflected in the business sector in Israel in different ways. The high teamwork capabilities and the experimental and value neutral attitude towards performance are two examples.

Israeli Culture

The culture in Israel seems to be suitable for entrepreneurship and innovation with its special traits such as the encouragement to challenge and debate both peers and authorities.

Furthermore, there are also the preferences towards working in small flexible organizations adding to the great fit between entrepreneurial firms and the culture.

International Networks

The Jews dispersed in the Diaspora, now returned to Israel have been of great importance in establishing links to markets bigger than the domestic. It has also been helpful in establishing access to capital, finance knowledge, support and inspiration from different parts of the world.

The Future of the Innovative Region in Malmö and Lund

There are a number of challenges in creating an innovative region in Malmö and Lund. In this section these challenges, and what the conclusions from Israel can contribute in taking on these challenges, are discussed.

Centralized Coordination and Control

Many of the problems in the Swedish innovation system are due to the lack of proper organization. In Sweden the three levels of national, regional and local politics creates uncertainties around who is responsible for what in the innovation system. Hopefully a more centralized innovation agency, like the OCS in Israel, could lead to a larger degree of coordination and control in the public innovation efforts. It might also lead to less bureaucracy in the overall system. However, it needs to be balanced by local presence of representatives making the organization flexible and adaptable to regional challenges.

Clear Purpose and Strategy for Public Support Organizations

In Israel the public interventions in the support system has been made with a clear purpose and desired outcome. In Malmö/Lund there are a lot of organizations involved in the support system.

Many of these organizations perform overlapping and sometimes even conflicting activities.

It is important for the state, the universities and the business sector to collaborate, nonetheless, this is not the same thing as fusing different stakeholders into hybrid organizations with fragmented ownership structures.

As been described by Porter, 1990, nations should specialize in what they do better than others. Maybe this is also true for the actors in the innovation system? What would the map look like if there were close collaboration but less shared ownership that might lead to confusion? The universities, R&D centers and the education system is creating the raw material in the innovation process. Companies in the region are working towards refining the raw materials into new profitable ventures. In parallel with this process companies arise, providing services and capital to the new ventures. The state is providing the lubricant for the system, making sure the laws and policies support innovation activities and making focused efforts to help where the market is failing, without skewing the competition on the free market.

Better Access to Capital

There is a need for more capital in the Malmö/Lund region. Today there are no private venture capital firms in the region according to the Swedish Venture Capital Association, SVCA. To be able to create a world class ICT cluster, access to finance is of utter importance. In Israel this was solved by the Yozma-program.

Another solution in Malmö/Lund might be to better syndicate business angels into angel groups. An angel group makes it possible for individual business angels with limited capital to consolidate their means and make larger

investments. This has been seen in Israel and seems to function fairly well.

More Commercial Drive in Incubators

The Israeli incubators work as a seed fund investing in all the companies they choose to work with. Hence they have a strong financial incentive to create profitable and market oriented startup companies that provides a return when exiting the incubator. The incubators also focus a lot on providing the incubator companies with international connections and access to capital when they are ready to move into expansion phase. The incubators in Malmö/Lund can look at the incubators in Israel for inspiration on how to work more extensively with growth issues, fundraising, and with a more commercial mindset.

International Collaboration

Malmö/Lund has a very beneficial geographic location with Scandinavia's largest airport within a short distance and access to Copenhagen through the Öresund Bridge, hence suitable for making international business.

Sweden is internationally connected but improvements can be made, especially when it comes to attracting foreign VC.

Conclusions

To compare innovation clusters is a difficult task since there are so many factors determining the cluster's success or failure. The thesis, however, connected some of the theoretical models on the topic in *The Innovation Ecosystem Model* in an attempt to create a framework for analysis and discussion. In future research there are even more aspects to look into. One example is to connect Richard Florida's theories on the creative class with the more systemic theories on clusters from Charles Edquist. Another example

of a future research field is a more philosophical one, to understand what kind of society is best suited for cluster creation.

In the end clusters need to be examined from many different angles. When combining the hard factors, the policy and program focused factors – the lessons from Silicon Wadi, with the soft factors, like Florida's theories around the creative class, there is a good chance that the ICT innovation cluster in Malmö/Lund can meet the future as a strong and creative region with dynamic economic activity and growth.

The Innovation Ecosystem Model as Applied in the Thesis

