THE STRATEGIC ROLE OF SCIENCE AND TECHNOLOGY PARKS (STPS) ON REGIONAL COMPETITIVENESS: SUGGESTIONS FOR TURKISH AEROSPACE AND DEFENSE (A&D) INDUSTRY

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Abstract

Many countries have established science and technology parks (STPs) as part of a strategy to develop engines of growth and competitiveness since for a long time. For example, the United Kingdom and France benefited tremendously from the industrial revolution in the 19th century, and the United States emerged from an agrarian economy into an industrial superpower in the 20th century. Taiwan and South Korea became industrialized countries by exploiting advances in silicon microelectronics from the early 1960s. Most recently, China and India have emerged as industrial leaders in manufacturing and information technologies, respectively. All of these countries invested quite heavily in people and innovations[1] and their success were based on carefully designed plans and strategies. Unfortunately, in many, if not all, of the developing countries, technology is being viewed as a consumable item, not something that can be produced or created. Technology is the primary engine of the economic growth and provides the key to unlocking any region's potential. Hence, countries that want to develop must invest significantly in science and technology. This is achieved by developing the talent, the human capacity required to compete in a globally competitive world. In this point, since the world has evolved as a global village, STPs have become crucially important for sustaining regional development and gaining competitive advantage irrespective of country and sub-sector of any industry. Thus, it is an important approach to depend on STPs' model and their resources to realize regional competitiveness to enhance national development.

The purpose of this paper is to do research on STPs that are most conducive to maximising the positive effects of the implementation of new industrial policy to regional development and competitiveness by regarding aerospace and defense (A&D) industry. In order to realize this aim, a comprehensive study has been done during research. Along with wide range of literature review, two different data collection techniques (focus groups and in-depth interviews) were also conducted to accomplish research. Descriptive technique was used for analysing the research. According to the research results, an STP play a major role for regional development, has a significant impact on research and development capability as well as innovation ability, thereof foster any industry. After analysing the research a conceptual model was also suggested for regional development by considering STPs via A&D industry's indigenous structure.

[1] According to IASP (2018), areas of innovation are places designed and curated to attract entrepreneurial-minded people, skilled talent, knowledge-intensive businesses and investments, by developing and combing a set of infrastructural, institutional, scientific, technological, educational and social assets, together with value added service, thus enhancing sustainable economic development and prosperity with and for the community.

Keywords: Science and Technology Parks (STPs), Competitiveness, Regional Competitiveness, Aerospace and Defense Industry, Strategy.

BİLİM VE TEKNOLOJİ PARKLARININ BÖLGESEL REKABETTEKİ STRATEJİK ÖNEMİ: TÜRK HAVACILIK VE SAVUNMA SANAYİİ AÇISINDAN BİR ÖNERİ

Özet

Birçok ülke, uzun zamandan beri, ekonomik büyümenin ve rekabet edilebilirliğin itici gücü olan bilim ve teknoloji parklarını geliştirme stratejisi olarak kabul etmiş ve kurmuştur. İngiltere, Fransa, Amerika Birleşik Devletleri, Tayvan ve Güney Kore gibi ülkeler, insan kaynağı ve yenilikçiliğe yatırım yapmış olup, başarıları ise dikkatlice hazırladıkları planlara ve stratejilere dayanmaktadır. Bilim ve teknoloji parklarının ana sonucu olan teknoloji, ekonomik büyümenin birincil itici gücüdür ve bölgesel gelişmişlik düzeyine erişmenin kilit anahtarıdır. Bu nedenle, ekonomik büyüme ve gelişmişlik düzeyini yakalamak isteyen ülkeler, bilim ve teknolojiye önemli yatırımlar yapmalıdır. Bu ise, rekabetçi bir dünyada, rekabet edebilir düzeyde insan kapasitesi geliştirilerek elde edilir. Küreselleşen Dünya'da, bilim ve teknoloji parkları; temel bilimleri, araştırma ve geliştirmeyi, teknolojiyi, sürdürülebilir bölgesel kalkınmayı ve herhangi bir sanayi alanında rekabet edilebilir düzeyi elde edebilmek için oldukça önemli aşamaya gelmiştir. Bu nedenle, bilim ve teknoloji parklarına dayalı bir model oluşturmak, ulusal kalkınma ve bölgesel rekabet edilebilirliği sağlamak için önemli bir yaklaşımdır.

Bu çalışmanın amacı, bilim ve teknoloji parklarının havacılık ve savunma sanayii üzerindeki ve yeni endüstriyel politikalar üzerindeki yapıcı, pozitif etkilerini analiz etmektir. Çalışmanın amacını gerçekleştirmek için kapsamlı bir araştırma yapılmıştır. Geniş bir literatür taramasıyla birlikte, araştırma yapmak için iki farklı veri toplama tekniği (odak grup görüşmeleri ve derinlemesine görüşme tekniği) kullanılmıştır. Araştırmanın analizi için tanımlayıcı teknik kullanılmıştır. Analiz sonuçlarına göre; bilim ve teknoloji parkları bölgesel kalkınmada ana rolde iken, araştırma ve geliştirme yeteneği üzerinde oldukça önemli etkiye sahiptir. Ayrıca inovasyon kabiliyeti ile de herhangi bir endüstri alanını gelişim için teşvik eder. Araştırmayı analiz ettikten sonra, bölgesel kalkınma için havacılık ve savunma sanayiinin içsel yapısı aracılığıyla bilim ve teknoloji parklarını da içeren kavramsal bir çerçeve oluşturulmuştur.

Anahtar Kelimeler: Bilim ve Teknoloji Parkları, Rekabet Edilebilirlik, Bölgesel Rekabet Edilebilirlik, Havacılık, Uzay ve Savunma Sanayii, Strateji.

1. Introduction

Scientific inquiry and exploration together with an urge to understand various phenomena in nature have existed parallel with the other civilizational developments that took place in the world throughout the history of humanity; however, nowhere in human history a more cogent quest than that signified in the divine commandment put forth in the first verse of the Holy Qur'an can be found. The first verse begins with a quintessential divine imperative commanding mankind to *read* (in Arabic Iqra). In other words, an attitude shaped around a cultural code encouraging learning and acquiring knowledge has been emulated by Islamic societies that learn and practice science. Islamic societies constructed upon this epistemic

attitude have established advanced civilizations in different time scales and ensured community prosperity and human flourishing. In the following periods, however, this advantage was lost with the departure from scientific exploration and discovery within the context of the aforementioned divine commandment.

On the other hand, it is not too late for the West to understand and appraise civilizational developments and recognize the supremacy of scientific discoveries brought about through various scientists in the historical background of Islamic civilization. This is not to say that no developments ever occurred in the western world. Francis Bacon is one of the leading figures in the history of science ranking alongside even Al Jazari and Isaac Newton, awakened his civilization as saying knowledge means power.

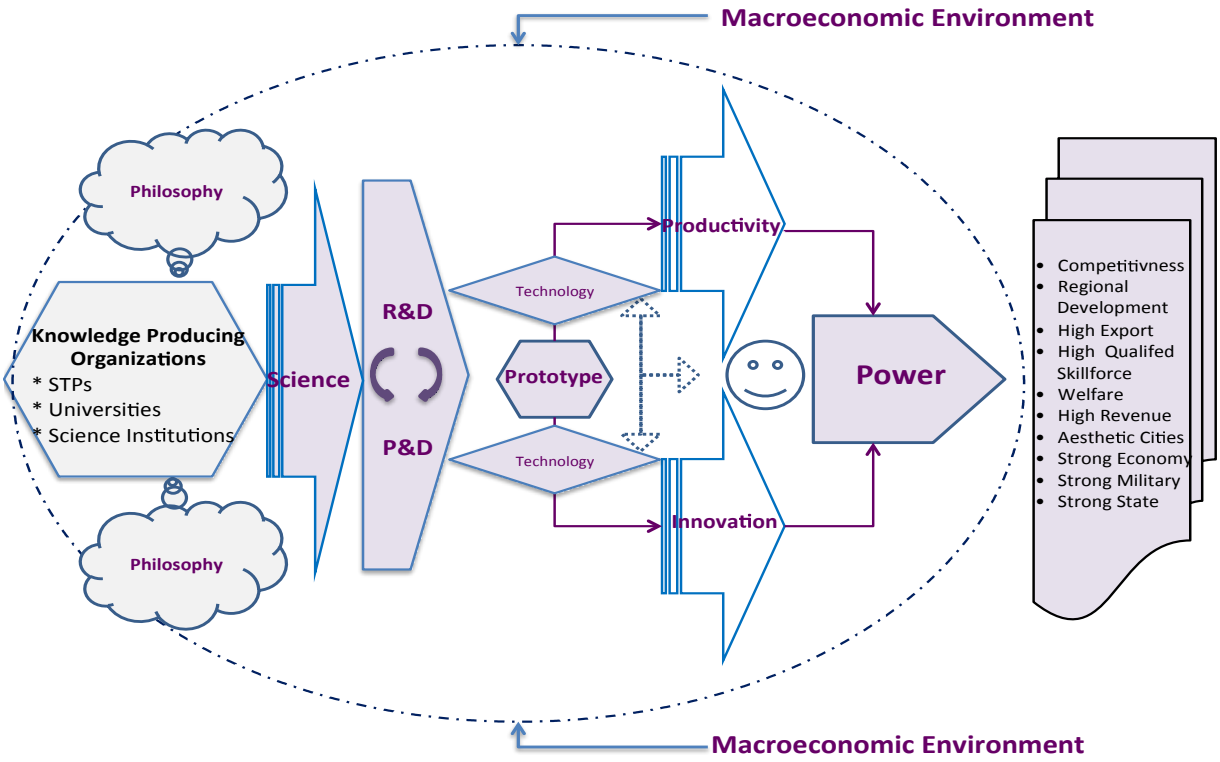

Figure 1. Science and Power Relationship

Globalization has actually turned the globe into a village and transformed and has put global populations into a tray in today's world. People can communicate with each other quite easily by using information processing technologies, and finance can be transferred to another destination within minutes. In addition to video and audio communication, people now have reduced the time period required for their money transfers to a click away, figures expressed in billions of dollars can easily be transferred from one slope to another in a few seconds without any extra efforts to be devoted to the task. Especially with the progress made in transportation, the circulation of goods is being conducted even for the longest distances

within a few days or even a few hours. What does all this mean? What has affected the financial capital, the quick change of goods and services? How do our companies, our sectors and our country, get and / or receive from these developments? These are the topics that need to be meticulously addressed and answered. At this point, the only element that is at the heart of global adherence to competition is science. As indicated Figure 01, STPs stand out as an important instrument in producing knowledge- information- science within this context.

2. Literature Review and Theoretical Framework

There is a wide range of benefits associated with STPs for their local, regional and national economies and innovation systems and there is plenty of anecdotal evidence that science parks have positive impacts on a wide range of measures including the performance of indigenous businesses, entrepreneurship, company formation (including spin-out processes), inward investment, technology transfer, innovation performance, skills development and other indicators of economic progress (Monck and Peters, 2009: 1). An STP is also perceived to be a vehicle in promoting innovation- based economic growth within the framework of regional and national innovation systems. STP is a tool to encourage regional innovation and competitiveness in increasing contribution of science and technology in regional and economic development (Soenarso, 2013: 32). In the 1990s, STPs, a land and property-led technology policy concept which aims at spatially clustering high-tech firms and R&D organisations, have been very popular among local, regional and national policymakers to boost regional economic growth. No matter how they are called, be it science parks, technopoles, high-tech centres, incubator centres, technology parks, technoparks or science cities, they have given hopes to policy-makers in many countries to boost regional technology transfer, innovativeness and hence competitiveness (Hassink and Hu, 2012).

2.1. Science and Technology Parks (STPs)

STPs have long been exiting in regional development and city competitiveness. First complex parks have come into existence in 1950s in USA [2], and have spread around the globe in various types. Nowadays there are different definitions describing these institutions. STP is an area with a collection of infrastructures dedicated to scientific research on a business regime. As mentioned; there are many approximate synonyms for science and technology park, including, research park, technopolis and biomedical park (Bindir et al., 2014: 38). According to International Association of Science Parks (IASP); an STP is an organisation managed by specialised professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and

knowledge-based institutions. To enable these goals to be met, an STP stimulates and manages the flow of knowledge and technology amongst universities, R&D institutions, companies and markets; it facilitates the creation and growth of innovation-based companies through incubation and spin-off processes; and provides other value-added services together with high quality space and facilities (*the expressions technology park, technopole, research park and science park encompass a broad concept and are interchangeable within this definition*) (IASP, 2018). STPs are the perfect habitat for businesses and institutions of the emerging global knowledge economy. Science and technology parks promote the economic development and competitiveness of regions and countries by; (1) generating knowledge-based economy and employment, (2) providing centre of excellence for the researchers, (3) enhancing the synergy between tertiary/ research institutions and industries, and (4) focusing on product advancement and innovation. Besides the physical buildings, these parks offer a number of shared resources, such as uninterruptible power supply, telecommunications hubs, reception and security, management offices, restaurants, bank offices, conference centres, parking, internal transportation, entertainment and sports facilities, etc. In this regard, the park offers considerable advantages to hosted enterprises, by reducing overhead costs of these facilities (Bindir et al., 2014: 38)

As European Commission Report indicated (2007: 53), STPs can have an important role mostly at four different levels; (1) STPs may provide the visibility and hence attraction to wider local strategies aiming at the creation of conditions for high-tech industries to prosper - cities and regions increasingly compete in seeking to become identified as the next region of knowledge, science region, creative region, and to attract value-added jobs, and are hence looking for distinctive features. It is clear that these features depend mostly on the 'right mix' of research excellence, entrepreneurial activity and public support strategies, but some elements such as science parks can contribute to their greater visibility. As such STPs can stimulate wider local strategies of support to high-tech industries and contribute to creating the conditions for the development of a research-intensive cluster (RIC). STPs can also influence the land use in the region, which is essential to the development of RICs, and often bear the name by which RICs are known, (2) STPs provide the advanced infrastructure on which research intensive enterprises rely on, besides the location factor, being often in close proximity to a university. STPs are providing the necessary infrastructures for research, such as advanced ICTs, and are expected to create also proper conditions for informal exchanges between firms, creating a specific social milieu, (3) STPs can provide complementary services

and support to local firms. Spin-offs and SMEs can often find in science parks wider support services that allow them to focus better on their core business and on research for the development of innovations. At the same time they contribute to greater interactions between different actors. These can range from administrative matters (*especially if the park includes an incubator*), to management support, to technology brokering or to support on managing intellectual property right (IPR). This is essential for a meaningful contribution to RICs, which should go beyond simple property development business. The role of a science park is also in facilitating access to other firms located nearby and to their clients, in contributing to the strengthening of diverse institutions within the local innovation system, and in stressing the innovation process and the knowledge exchange, (4) STPs are usually associated with strong networking effects and high levels of social capital – as mentioned above. The impact of science parks is greater at an informal level and by contributing to the development of heterogeneous networks, including diverse actors (*knowledge producers, users, disseminators*), diverse disciplinary backgrounds or even industrial sectors. The social capital that may thus develop in science parks can facilitate the exchange of tacit knowledge, the formation of 'communities of practice', or the greater access to advanced human resources. Although these networks can emerge outside of the specific relationship with local universities or research institutes, the success of these relationships is of great importance to local knowledge networks that may emerge. Although science parks can indeed have a strong impact on the development and sustainability of RICs, a number of conditions need to be in place for it to be successful and relevant for the development of a RIC. As previously mentioned in relation to RICs, science parks are not to emerge everywhere as a guaranteed recipe for success. Science parks must take into account the existing local research capabilities, as well as opportunities, the local industrial structure and the wider public strategies for the region.

STP can also be a leading sector in creating conducive environment for local community's technopreneurship (Soenarso, 2013: 32). STPs are sources of entrepreneurship, talent, and economic competitiveness, and are key elements of the infrastructure supporting the growth of today's emerging knowledge economy. By providing a location in which government, universities and private companies cooperate and collaborate, science and technology parks create environments that foster collaboration and innovation. They enhance the research and development, commercialization and transfer of technology. University research and science parks provide the launch pad that startup enterprises need when they are spun out from a

tertiary/research institutions or industry. Park-provided training in such areas as intellectual property law and business planning help the fledgling businesses to succeed. Tertiary/research institutions, in turn, benefit by exposure to the business world, and the connection to the cutting-edge research being conducted outside the ivory towers in the industry (Bindir et al., 2014: 39). With the continuously developing globalization, competitors can be anywhere around the globe and rivalry is more fierce than ever. That is why it is important to work together with nearby organizations to create added value that cannot be copied by those far-distance competitors. Organizations have realized that other parties in their region are no longer only rivals, but are also beneficial when they are seen as collaborators. Within an ecosystem, interaction creates mutual benefits from each other's competences, knowledge and networks, which allow for an accumulation of knowledge and expertise. These collaborations allow for achievements that could not have been made by any single person or organization. This has brought forward many breakthroughs throughout the years and many new ecosystems such as incubators, research parks and STPs have been built all over the globe, resulting in successful collaborations, economic developments, innovations and business improvements. The way these parks develop and operate is unique for each park and cannot be copied. Behind each entrepreneurial ecosystem and STP lies a complex mechanism that will be explored within this essay, along with the effects that Entrepreneurial Ecosystems and SPTs have on regional, national and global level (Broechler, 2013). In the creative economy, the main player leading sustainable economic growth with job creation is science and STPs in technopolises, making direct contributions to fostering national and regional competitiveness (Oh, 2013).

In conclusion, STPs are of great importance in the business context of the region in which they carry out their activity. They are the main mechanisms of public and private initiatives for the promotion of research, development and innovation, and technology transfer. The main goal of this type of institutions is not only a purely economic benefit, but also social and cultural enhancements, which makes them an appropriate investment for public institutions. They promote the creation of companies and agreements with universities and research centres, generate employment, and attract technology-based companies. Therefore, they require in-detail assessment to understand their operation to generate action plans and models that new parks or those who are still in their initial growth phase may follow. Within this context, STP(s) play an essential role, because their existence represents an important factor

in the competitiveness of the economy of a region or country, as well as a field for business investment (Guadix et al., 2016: 1).

2.2. Regional Competitiveness

Regional competitiveness mainly refers to the international competitiveness of economy in a country or a region in the economic globalization environment, namely, the ability of an economic region to produce more wealth than the competitor (*other regions of the same kind*) and occupy a domestic and foreign market with more shares by attracting and effectively distributing resources within the global sphere so as to realize sustainable increase of regional economy. The World Economic Forum (WEF) and International Institute for Management Development (IMD) pointed out in the international competitiveness evaluation system that was established in 1980, the international competitiveness was a quantified concept, and among the eight major elements, scientific competitiveness and competitiveness of the populace's cultivation were the core competitiveness. There are 22 out of the 44 indexes in the competitiveness of populace's competitiveness and 19 out of the 26 indexes in the scientific competitiveness that are related with education, especially higher education. Furthermore, regional innovation becomes the major motive for regional economic sustainable development and knowledge resource is endowed with new connotation in regional innovation. Regional innovation clamours for double improvement of knowledge resource both in terms of quality and in terms of quantity and requires the higher education which is the important place of origin for development of high intelligence and innovation to assume more important responsibilities in the process of regional economic development. In other words, the populace's cultivation and science and technology with the source of higher education are the core elements to enhance regional competitiveness (Dong and Tang, 2017: 177).

It has been recognized by policy makers that technology and capability of conducting research are the core factors in regional economic growth and regional development (Kang, 2004). Thus, Science & Technology Parks (STPs) are a rapidly growing phenomenon and an increasingly common tool of national and regional economic development (Wessneer, 2009). STPs stimulate and manage the flow of knowledge and technology amongst universities, R&D institutions, companies and markets to enable the goals of promoting regional competitiveness and economic development. They have to facilitate the creation and growth of innovation-based companies through incubation and spin-off processes; and provides other value-added services together with high quality space and facilities (Oh, Byung Ho, 2008).

Today STPs are as the main linkage between university and industry in order to develop and commercialize innovations and new products/services. An STP is an area where innovation is a key and supports university, industry and even government collaborations to speed the development of high tech-economic and advancing knowledge. They provide a variety of shared resources such as incubators, collaboration activities, uninterruptible power supply, reception and security, science and technology corridor, management offices, restaurants, bank, internal transportation, entertainment and sports facilities to bring the potential ideas and products/services in the market and industry to improve the community prosperity (Aslani et al., 2015: 25).

An STP has two main objectives. The first is to act as a catalyst for regional economic development, while the second relates to facilitating the creation and development of new technology-based companies and knowledge transfer from universities to companies. According to some authors, a science park is commonly defined as a tool aimed at promoting industrial growth in terms of employment and production. Nevertheless, they consider that this definition must not conceal the fact that a park is a high-tech business area deliberately set up by governmental initiative or related with universities. Thus, it can be said that the immediate goal of a park is to facilitate business development with the final aim of promoting regional development. However, a science park should obviously not be the only player in a regional innovation strategy. Other perspectives point out that a park is promoted on a given territory because of three reasons. Firstly, a region may look for reindustrialisation and try to replace jobs in declining traditional industries by jobs in new hi-tech sectors. The second reason is involving the region itself in these new, fast growing industries. Such is the case of ICT and biotechnology, which are meant to improve the economic status of a region. Finally, a region may want to use a science park as a strategy to create synergies between different players. There is a problem in trying to measure the success of a science or technology park: there is no clear consensus on the definition of such success. Some authors use financial criteria (*investment, turnover etc.*) while others take indicators related to innovation patterns (number of start-ups, patents, new products launched by incubated companies etc.) (Vila and Pages, 2008: 145).

In conclusion, science and technology parks (STPs) promote the construction of a new model of economic and social development, and have been playing an increasingly influential role in the stimulation and growth of the knowledge economy. STPs are ventures that seek to promote regional sustainable development through innovation, coordinating the resources of

several strategic actors involved in these initiatives. The integration of these resources is complex and the success of this ecosystem depends on a number of factors such as the presence of a strong scientific and technological base, entrepreneurial culture, public and private resources, anchor companies, networking, real estate development and production chains, among others (Riberio et al., 2016: 88).

2.3. Aerospace and Defense (A& D) Industry

Aerospace and defense (A&D) industry produces a number of high tech productions and services in today's business market. For instance sector's companies build aircrafts, ships, spacecrafts, weapon systems, defense equipments, and related military services. They sell their products and supporting services and sustainment programs not only to governments but also to private companies and institutions. In other words, A&D sector includes businesses and institutions whose products and services are used for civil aviation and national defence and security. As indicated below Figure, the industry has a wide range of productions from aircraft to ships.

Source: Curan, 2016.

Figure 2. Classification of A& D Industry by Technology Priorities- Segments

A&D industry consists of a diverse set of manufacturers from civil and military aerospace and defence procurements [3]. Products include vehicle systems, aircraft components, and electronic assemblies and services related to maintenance, repair and overhaul; system

support and training; and training simulation for military and commercial aviation. Air traffic systems, mission systems and ground equipment of various kinds, as well as the space industry and security-related capabilities can be added this industry. If we look at the industry as a whole; while there are large conglomerates that develop and manufacture a wide range of aerospace and defence products, there are also niche players that supply specific technologies or products.

The A&D sector today stands in front of powerful growth trends in technology development, manufacturing processes, global competition, complex security patterns, and cross-industry innovation, all while facing a geopolitical landscape that is ever-changing and uncertain. Various corporate vehicles for value creation continue their progress to navigate through these trends, including cross-border joint ventures (JVs). Cross-border JVs stand to offer impressive channels to create new markets, products, and services. Success with cross-border JVs will demonstrate the efforts of various contributors, limited to not just the JV partners but potentially government bodies and policies, and financing and technology development institutions (Deloitte, 2017).

The sector includes companies involved in the industry's high technology infrastructure. Especially the aerospace sector plays pioneering role among those industries. Aerospace is widely seen as the instigator of technology change in many fundamental engineering disciplines, including electronics, sensing and communications, the use of new metals, composites and plastics, and the development of new, more efficient and sustainable power and energy systems. In addition, aerospace is pioneering changes in business process, including the servitisation trend, where customers buy the availability of the service provided by an engineered product, rather than the product itself. Airlines, for example, are increasingly devolving responsibility for aero-engines to manufacturers, rather than owning the power units themselves. Aerospace is at the forefront of product data management, which automates the statutory requirement for traceability of materials and components. There is also significant innovation in the manufacturing processes. Aerospace is an important testbed for broader developments in automation, assembly and inspection. Aircraft, seen as highly complex examples of systems and assemblies, present manufacturing challenges that have implications for many other engineering sectors (Royal Academy of Engineering, 2014: 3).

Thus, the production structures and activities of A& D industry overlap enhancing innovation and technology policies of any nation. Nations have long striven to advance to the next technology frontier and raise their economic well-being. In today's highly dynamic

environment, advanced technologies have become even more essential in improving economic competitiveness and national prosperity. As a result, many nations, including the United States (US), have invested heavily in establishing national innovation ecosystems which connect people, resources, policies and organizations to collectively translate new ideas via advanced technologies into commercialized products and services. A new global competitive environment has emerged in which America's technology and innovation leadership faces fresh and persistent challenges (Deloitte, 2015).

As indicated below Figure, along with STPs A& D industry directly affects ecosystem of national R& D capacity, national innovation capacity etc., which directly impact total national science as well as technology development and other sectors including services and agriculture.

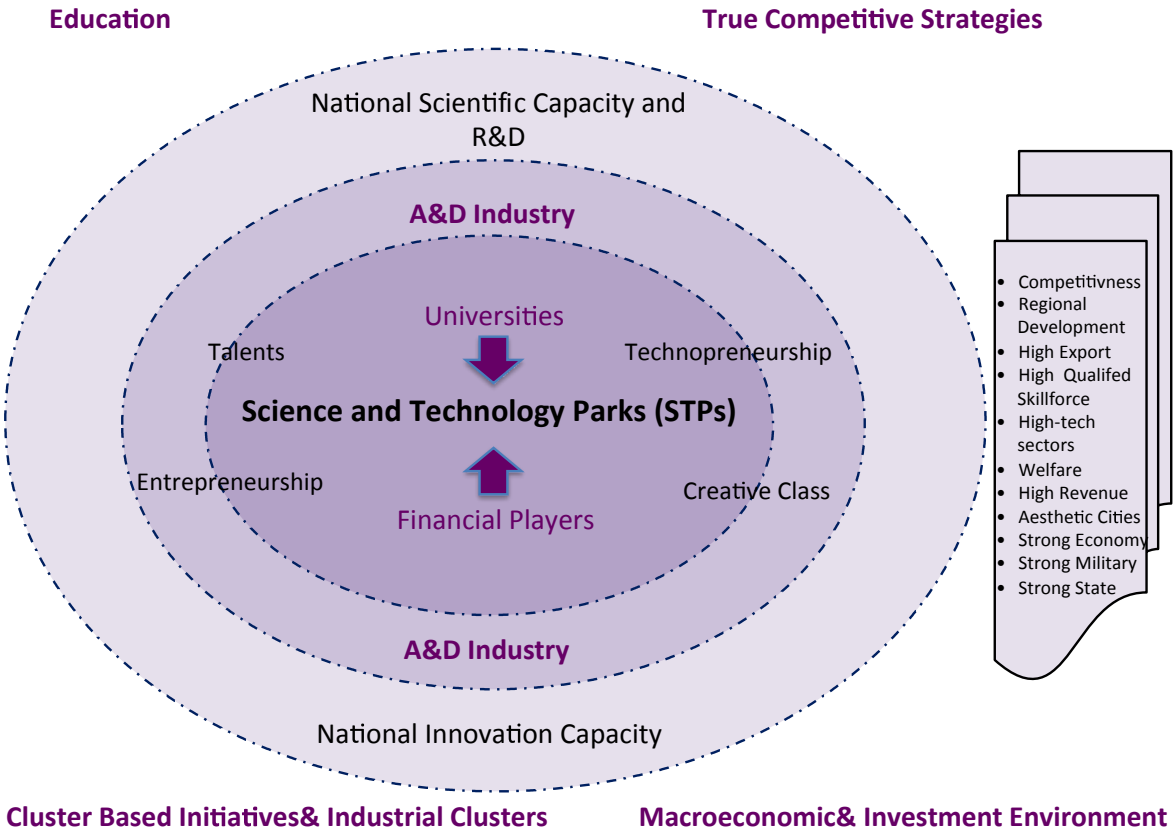

Figure 3. Impact of A& D Industry and STPs Relation

3. Methodology of Research

The purpose of this paper is to do research on STPs that are most conducive to maximising the positive effects of the implementation of new industrial policy to regional development and competitiveness by regarding aerospace and defense (A& D) industry. In order to realize

this aim a comprehensive study has been done during research. Along with a wide range of literature review, two different data collection techniques (*focus groups and in-depth interview*) also conducted to accomplish research. Descriptive technique was used for analysing the research.

This research is based on qualitative research in which secondary and primary data were used for analysis. Descriptive analysis and conceptual models were also utilized for the study. In this study, primary data collection method is used together with secondary data collection method. In-depth interview and focus group are two techniques used as primary data collection methods. Besides sectoral data in terms of A& D industry were collected from various sources such as sectoral reports, etc. as secondary source.

In-depth interview method was applied to sector managers and members of related non-governmental organizations, and to decision makers in the light of findings in the literature review. In order to prevent directing the applicant, and to attain the information completely and correctly, interviews were held in a chatty environment. To enrich the analysis and its comprehensive framework, the authors have also conducted five different focus groups in which experts were invited and data collected; lasted 3-4 hours to help the researchers for assuring about the validity and reliability of the research.

4. Conclusion and Discussion

The development of the level of social welfare can be achieved by making effective use of the possibilities of scientific and technological studies. The duty of the contemporary state is to prepare organizations that will increase the prosperity of the community. Scientific and technological development can be achieved through the good use of existing facilities in a short time. Development is achieved by turning scientific thinking into a lifestyle in society. Throughout the history of humanity, we can say that the most fundamental source of power, superior to other nations, is knowledge. When we look at the books of history; we will see that not only soldiers have fought but there has also been a war of technology and strategies. The technologies will not only subjugate the nations to other nations, but also bring them refinement.

By the mid-1700's the inventor entrepreneurs started the industrial revolution in England. The machines, the carp and the steam started a new wave of wealth with power. For example, the British cotton industry, which uses the power of the machine, has almost exacerbated India's export of textiles to Europe in 20 years. In other words, a technology invented thousands of

miles away has left Indian textile workers working with muscle strength unemployed and poor. The era of enormous innovations and riches, consisting of steam railways, coal-steel and electric power, oil-fired internal combustion engines and jets, chemical industry and mass production, triggered by automotive, electronics, computers and many more innovations, has been and continues.

We can say that innovation is directly related to your wealth. There are a number of factors that determine the innovation capacity of a country. Only individual skills or superior entrepreneurs or public support are sufficient for innovation. Innovation is the work of an ecosystem. When we examine the United States, one of the leading countries in innovation, we see that public policies, cooperation environment, academy, entrepreneurial quality, financial funding capacity, tolerance environment, national market depth and all other components constitute the most suitable environment for innovation. It's not hard to see why companies such as Google, Apple, and Boeing are making their debut in America, not in another country.

For example, we could not get a position when we were aware of the transition wave from tubular televisions to panel televisions at the same time as the world. Most of the time we are far behind developmental waves. For example; We are talking about Daimler-Benz in 1883, Ford in 1903, and in 2012, it's time to produce a local automobile. Timing is very important. The jobs that were entered before time are tired of investors. In the aftermath of time, the entrance bar is high and the cost of investment increases. It is difficult for a new player to get a competitive position in a market where the traders are sitting. In the automobile industry, Hyundai is a good example. Supported by public policies, Hyundai has achieved great success in a challenging market. Although industrial steel production has a century-old history, steel production technology remains essentially the same. Producing steel continues to be a profitable business for many entrepreneurs, even though a look is nothing to be seen in technological innovation. Similar examples can be given in many industries. Without forgetting that it is essential to produce added value it is difficult to determine their strategy for Turkey. But we must also know that it is difficult for economies to survive without innovations in today's tough competition world.

On the other hand, we see that the share of R& D expenditures in the Gross National Product increases. There is only one goal: to try to strengthen the countries' competitiveness with R& D and innovation. US, Turkey's economy makes up half of the spending in R& D, while South Korea is making seven solid R& D investments in Turkey. In today's world no one is

strong alone. In the new millennium, cities and regions are predicted to be even more important actors in the global economy. These regions are trying to be a center of attraction for innovative and talented people and entrepreneurs. Talented people are innovating in an ecosystem that supports them. This support; sometimes right suppliers, sometimes laboratories, sometimes designers, and in the broadest sense, value chains.

In this respect, several countries have adopted different strategies, models and policies to assist companies to develop their technological capabilities. These include high tech cluster development, creation of venture capital fund, establishment of technology incubation center, and Science & Technology Parks (STPs) (Mangrio et al., 2013).

Kusharsantoa and Pradita's conceptual study (2016: 551) reveals that several cities in Indonesia (*as representative of nation*) require STP to be a center of excellence in connecting all stakeholders who generate innovation. If human capital, resources, and good public policy are the dots of RIS' elements, so that STP is the place to connect those dots and creates satisfying collaboration. The things that have been categorized as quite good and should be improved are such as Indonesia's stable economic growth, creative businesses especially in SMEs, the innovative government, and ICT mastery.

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