34th IASP Annual World Conference
Istanbul, Turkey

Measuring the performance of R&D focused companies: A unique evaluation system

Parallel Session 6
"The future: lessons, methodologies and new to-dos"

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EXECUTIVE SUMMARY

The objective of this abstract is to present proper methodology to rank companies according to their R&D and commercialization performance. The methodology aims to find a model to evaluate the performance of companies on the basis of 4 titles, which are:

- Project and Personnel Data
- Income and Expenses
- Collaboration
- Patents

It is vital for management companies to follow up, analyze, support and help to accelerate its tenants' growth. This evaluation system is a beneficial tool for the follow up procedure. It also gives critical clues about companies.

ODTÜ TEKNOKENT aims to get basically 3 different benefits from this study:

- To find out outperforming and underperforming companies located in the ecosystem
- To identify needs of companies
- To measure applicant companies' performances

Introduction

Science and technology parks (STP) were firstly established in USA. The most famous ones are Silicon Valley and Route 128. Their main aims are helping to create an innovative environment and generate continuous stream of innovations in an environment of information sharing and knowledge spillover both across and among firms and academic institutions, via informal channels. (Zeng, Xie, & Tam, Evaluating Innovation Capabilities for Science, 2010)

Science parks have played an important role in promoting innovation, entrepreneurship, growth of knowledge-based companies and in return economic growth within their regions. (Zeng, Xie, & Tam, Evaluating Innovation Capabilities for Science, 2010) In the last decade, in EU, STPs are getting greater importance in the economy day by day.

The 2013 numbers of the STPs show its impact on EU economy:

- *366 STPs*
- *28 million m^2 completed building*
- *40.000 organizations*
- *750.000 people*
- *€11.7 billion total capital investment (2011-2012)*
- *€5.6 billion ERDF (European Regional Development Fund)*
- *€3 billion financial support*

What is the purpose and the role of Science and Technology Park (STP)

Mainly, STPs have key role in developing countries' technological progress. In order to realize this progress, STPs set certain roles and goals. Some examples of these goals are;

- To enhance countries or regions R&D potential
- To maintain a strong collaboration between industry and university
- To transform universities' research outcomes into economic value
- To encourage and support entrepreneurship and innovation
- To create suitable environment for technology transfer

These are very significant and critical goals. Below you may find some examples of STPs' roles given during this difficult journey.

The majority of EU STPs are differentiated from high quality business parks or other property investments through these steps; they

- Carry out tenant selection policies
- Selectively prioritize the newer knowledge-based technology industries
- Engage with the knowledge based institutions (primarily universities and public research organizations)
- Engage cooperatively with other public and private sector actors
- Own and/or operate one or more business incubation schemes
- *Provide professional business support and innovation services designed to increase the depth and extent of innovation-led and knowledge based business in their region as well as within their park.* (European Commission, Setting Up, Managing And Evaluating Eu Science And Technology Parks, 2013)

It is very obvious that in order to reach these goals and operate effectively, STPs need to follow up and measure its tenants' R&D performance regularly. In the next chapter the methods of measuring will be investigated.

How STPs Are Measuring the Performance of R&D Focused Companies

In the literature, there are several models which are designed by many STP planners, operators and promoters' considerable experience. Based on an article (Zeng, Evaluating innovation capabilities for science, 2008), they created a design for evaluating the innovation capabilities of China's STPs. In this article evaluation indicators for innovation system of science parks are identified as below.

IOSS (Innovation Organization Sub-System): The IOSS is the core of the continuous operation for cluster innovation and the main source of continuous innovative capability.

ISSS (Innovation Support Sub-System): The indicators of ISSS include innovation infrastructure and technology intermediary. The technology intermediary consisting of technology transfer centers and incubators is regarded as the bridge for knowledge spill and technology diffusion.

IESS (Innovation Environmental Sub-Systems): The indicators of IESS include policies and regulations, cluster and financial environments.

In European Commissions article (European Commission, Setting Up, Managing and Evaluating EU Science and Technology Parks, 2013) *Evaluations are tent to find "**what did you want to change**?" and "**how would you know if you have changed it**".*

They are asking these question for not only bureaucratic requirements but also the essence of good programming. Question evaluations are defined by scientific and statistical tools. (European Commission, Setting Up, Managing and Evaluating EU Science and Technology Parks, 2013)

Sub-System	Indicator
IOSS	Ratio of R&D founding to the regional GDP (X_1)
	Newly granted patents per millions of people (X_2)
	Ratio of R&D spending to the regional total technology spending (X_3)
	Ratio of R&D staff to employees (X_4)
	Regional GDP per capita (X_5)
	Ratio of exports to the total income from technology, industry and trade (X_6)
	Gross industrial output value (X_7)
	Annual growth rate of R&D staff (X_8)
	Annual growth rate of R&D expenses (X_9)
	Ratio of annual growth rate of profits to the total income from technology, industry and trade (X_{10})
ISSS	Annual growth rate of high-tech enterprises (X_{11})
	The ratio of internet users (X_{12})
	Turnover of technology market (X_{13})
	The number of technology intermediaries (X_{14})
	The number of practitioners in technology intermediaries (X_{15})
	The annual number of incubators graduated (X_{16})
IESS	*The degree of being protected for Intellectual Property in cluster (X_{17})
	*The satisfactory degree to clusters policy (X_{18})
	*The degree of industry correlation (X_{19})
	*The degree of cluster cooperation (X_{20})
	Annual growth rate of regional investment (X_{21})
	The total fund for incubators (X_{22})
***Note:* *The indicators are measured by a qualitative index, which needs to be quantified.**	

Table 5 Innovation Indicators

In the article, evaluations revisit to see the difference between the beginning and now. They called this a "theory of change". A table about the "theory of change" is summarized in the following two tables. (European Commission, Setting Up, Managing and Evaluating EU Science and Technology Parks, 2013)

Issue	Explanation	Examples
Market failure and rationale	What is the problem the initiative is trying to address	• Knowledge-based start-up companies face adverse conditions • There is no risk capital to be invested in innovative ideas • Knowledge-based employment is growing less rapidly than in competing locations • Innovation is inhibited because there is insufficient awareness of the beneficial effects stemming from it • Knowledge base institutions are reluctant to work with third parties • IP is not commercialized.
Baseline	How can the problem be measured on the basis of verifiable indicators	• Knowledge economy performance worse than elsewhere • Measured for example by: o Numbers of company start-ups o Venture capital investments o Patenting and licensing activities o Employment in well paid high tech sector jobs
Activities	How is the problem to be addressed – what exactly is to be done	• Undertake concept and feasibility study of new science park and implement it • Develop a placement scheme for university students • Stimulate small business development through an incubator
Inputs	What are the costs? What are the resources (Money and in-kind) to be devoted to addressing the problem	• Capital expenditure on a science park • Operational spending on the science park management team

Outputs	What will be the initial results	This list can be very long, reflecting the specific nature of the initiative. For example: • Site prepared • First building erected an occupied • Management team employed • A range of animation measures undertaken • Specialist business advice provided
Outcomes	What are the long lasting effects	• Knowledge-based companies created and supported • Job opportunities in knowledge-based jobs created and supported • Innovation opportunities realized in companies
Impacts	How has the knowledge economy developed	• A richer and more successful knowledge economy that can compete internationally

Table 6 Theory of Change Underlying Science Park Evaluations

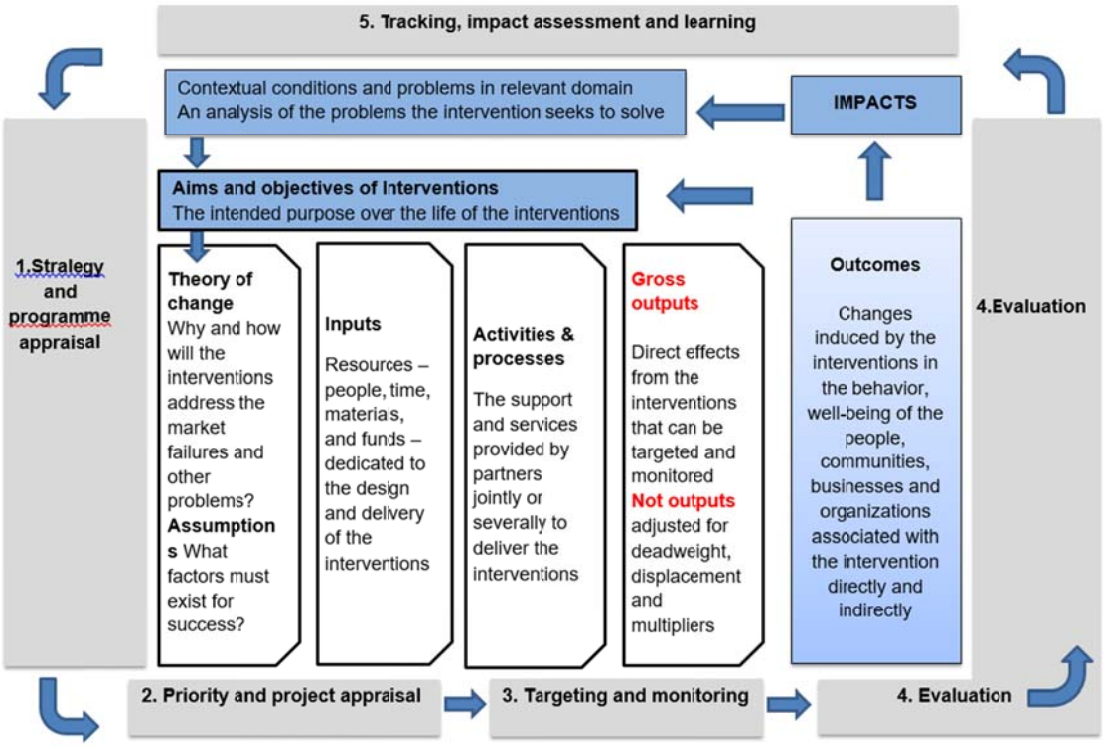

Figure 20 Tracking, Impact Assesment and Learning

No	Indicators
1	Area of land developed (in hectares) and building space constructed (in square metres)
2	# of companies
3	# of employees
4	# of qualified scientists
5	# of engineers employed
6	# of companies that have graduated from the park
7	Rental and services income per month
8	Type and range of common services provided by the park
9	Type and range of professional services provided by the park
10	Funding for capital and operational purposes raised and spent
11	Inward investment projects attracted to the region by the science park itself
12	Cooperation with others

Table 7 Indicator

These are fundamental indicators for this study and some of them will be used during the analysis. Another good example from literature is presented by Jakeline Serrano García, Jorge Robledo Velásquez. In their paper, they studied on measuring technology innovation capability in seven categories.

Categories	Explanations
R&D Capability:	Organizational skills to creatively generate and apply knowledge and to manage the R&D and technological transfer portfolio.
Production Capability:	Organizational skills to transform the results of R&D into products. (Project development)
Strategic Planning Capability:	Organizational skills to formulate and implement innovation policies, programs, and strategies in accordance with the institutional vision and mission.
Organizational Relationship Capability:	Organizational skills for effective interaction with the actors of the innovation system, in local, national and international settings.
Organizational Learning Capability:	Organizational skills to manage knowledge and build an organization that learns.(collaboration management)
Resource Management Capability:	Organizational skills to properly manage, acquire and assign resources for innovation development.(ıncome and expenses)
Marketing Capability:	Organizational skills to promote and sell the products of research, and the potential innovations, based on understanding the needs of the community, the costs, the benefits, the competitive surroundings, and the acceptance of innovation. (Patents, intellectual rights)

Table 8 Technology Innovation Capability

Source: (Jakeline Serrano & Jorge Robledo, 2013)

Jakeline Serrano García and Jorge Robledo Velásquez's paper has some common criterias with Table 4. In this study we will get help from both papers.

ODTÜ TEKNOKENT Evaluation System

1. STPs in TURKEY

After the declaration of "no 4691 Technology Development Zone (TDZ) Law" in 2001, Science and Technology Parks (STPs) have been rapidly popular in Turkey. As an organized research and business center, where academic, economic and social infrastructure meets, Science and Technology Parks (STPs) host universities, research institutions and industrial enterprises together in the same environment and facilitates them to do research, development and innovation activities through mutual transfer of know-how and technology for the sake of realizing value added products. In Turkey, Science and Technology Parks (STPs) provide some financial advantages to their R&D companies. For example, the companies located in Science and Technology Parks (STPs) can benefit from miscellaneous tax incentives. The companies are officially exempt from corporate tax and their R&D personnel is exempt from income tax. Apart from these, software products are exempt from VAT. Finally, R&D companies can benefit from 50% social security premium exemption for their personnel. Generally these incentives has attracted most company's attention. Nowadays there are almost 60 STP's in Turkey and more than 40 of them are active.

2. ODTÜ TEKNOKENT

ODTÜ TEKNOKENT is the first, most innovative and most mature technology park in Turkey. It is established with the purpose to play a role in directing the technology production and experience by supporting enterprises and encouraging innovations and to be one of the important elements of regional sustainable development among mainly the European Union countries that will strengthen international collaboration, creates an environment for the transfer of technology through giving priority to those companies that are capable to compete at global scale.
ODTÜ TEKNOKENT has reached to a scale of 340 firms more than %60 set up in ODTÜ TEKNOKENT. This is a good example how ODTÜ TEKNOKENT becomes a sustainable STP in 15 years of period. Below some of main operations are listed, which are crucial activities in order to support R&D companies.

Clustering

- In accordance with the prioritized areas of ODTÜ; ICT - Telecommunication, High-tech Consumer Electronics and Life Sciences are the strategic areas. ODTÜ TEKNOKENT is constantly developing new policies and supporting programs in these areas by hosting the largest companies of Turkey to share their know-how and projects with the smaller companies. This model provides the smaller ones the chance to develop deeper know-how in very specific areas and the larger companies to become more innovative and to be more flexible and avoid being oversized.

Entrepreneurship

- Within the framework of its strategic plan, ODTÜ TEKNOKENT is working hard to encourage techno-preneurship, facilitate university-industry convergence and increase internationalization of its companies. Incubation Programs, Business Plan Contest, Business Accelerator, Technology Transfer Office, Pre-incubation Centre for Digital Gaming and Association for Business Angels Network are the major components of this quest. Under these programs, chance is being given to transform new ideas to businesses. These programs are supporting mechanisms for sustainability of technology parks with new start up-spin off companies.
- Apart from the incubation programs, there are two important pre-incubation programs that are being carried out by ODTÜ TEKNOKENT for the development of entrepreneurship; the first one is the business plan contest, namely 'Yeni Fikirler Yeni Isler' (YFYI), has been organized by ODTÜ TEKNOKENT since 2005.
- ATOM, Animation Technologies and Game Development Center is another pre-incubation program founded by ODTÜ TEKNOKENT. The main objective of pre-incubation structures and systems is to prevent the loss of creative ideas produced by participants and to convert these ideas or projects into experience and investments.
- For the companies of 0-5 years old that were successful enough to survive from their incubation phase, one of the incentives provided by ODTÜ TEKNOKENT is the Business Accelerator Program - Teknojump. To shorten the duration from prototyping to mass market and to accelerate the internationalization process of technology-based startups through their process of commercialization are the main objectives of the program.

Technology Transfer

- In addition to these, ODTÜ TEKNOKENT through its Technology Transfer Office (ODTÜ TTO) also serves as an intermediary institution with the basic motive to facilitate the commercialization of research outcomes of ODTÜ. The support mechanism covers the entire process - beginning with IPR protection and spanning till the formation of spin-off companies and licensing agreements

Investment

- In order to support entrepreneurship activities, ODTÜ and ODTÜ TEKNOKENT apply The Business Angels concept, which has been developed and used in the world as a solution to the early stage financial problems, for the first time in Turkey. "METUTECH-BAN" (Association for Business Angels Network) which has been founded for this purpose brings together technology investors as an association and aims to introduce the technology-based entrepreneurs with the investor business angels who are members of the network.

- ODTÜ TEKNOKENT is in the process of raising "TeknoFund", a private equity investment fund focused on technology and innovation. TeknoFund will aim to generate long term capital appreciation by making growth capital investments in a diversified portfolio of start-up and/or early-stage companies and projects.

Internationalization

- By being a member of Europe's largest technology transfer network, Enterprise Europe Network (EEN), ODTÜ TEKNOKENT tries to bring SMEs together for international technology collaborations. Through Development of International Cooperation Projects supported by the Ministry of Economy, ODTÜ TEKNOKENT supports the internationalization of its companies, by organizing trainings and B2B Events and by attending trade fairs.

Evaluation System

ODTÜ TEKNOKENT receives applications from all over Turkey. After a review period, the applicants are either accepted or rejected. Moreover, ODTÜ TEKNOKENT helps startups to found their companies through its entrepreneurship programs.

Thus, ODTÜ TEKNOKENT have direct effect on its performance by electing the resident company and startups. This was mentioned on Setting Up, Managing and Evaluating EU Science and Technology Parks, 2013 as well.

The methodology aims to find a model to evaluate the performance of tenants and the applicants. It is vital for management companies to follow up, analyze, support and help to accelerate its tenant's growth. This evaluation system is a beneficial tool for the follow up procedure. It also gives critical clues about the companies.

ODTÜ TEKOKENT aims to get basically 3 different benefits from this study:

- To find out outperforming and underperforming companies located in the ecosystem
- To identify needs of companies
- To measure applicant companies' performance

Firstly, it is planned that the companies will be divided into 4 groups like below since the performance results are relative to other companies. The system does not want to compare a billion dollar company and a fresh startup. The categories are given below:

- Micro scale – companies which have less than 10 personnel
  These companies are generally newly found early stage companies. These are the companies which are supported through entrepreneurship programs.
- Small scale – companies which have 10 – 50 personnel
  These are the companies which are successfully survived and stand on their own legs means that they could sell their products and get revenue.
- Medium scale – companies which have 50 – 100 personnel
  These companies have regular revenue and some of them export their products.
- Large scale – companies which have more than 100 personnel
  These companies are branches of giant companies such as Aselsan, Siemens, ATOS etc.

The method is used to determine to what extent a company is eligible for state subsidies. This approach contrasts with more traditional way to classify companies on the basis of financial criteria. This information may, however, not always be available or the company may have to be evaluated using other criteria. That's why the methodology identify some more benchmarks. Eligible companies are ranked on the following 4 titles which include the data sets given below:

- Project and Personnel Data
  R&D expenses, R&D personnel, total personnel, Graduate and Phd personnel
- Income and Expenses
  Domestic income, Export, Import, Domestic Expenses, exemptions
- Collaboration
  University industry collaboration, International collaboration, Collaboration within technology park residents, Collaboration budget
- Patents

Patent applications (domestic and international), Patent received (domestic and international)

Resident companies and applicants have access to ODTÜ TEKNOKENT's portal which is called Teknokent Information System (TKBS). The companies submit their data regarding the titles above to TKBS four times in a year. Hence ODTÜ TEKNOKENT gets a chance to analyze the company's progress each quarter. A company's scores for each parameter is calculated with a statistical methodology. This is widely accepted and used method, which is called min - max normalization method. Each title has more than 5 sub-titles. These subtitles have coefficient which is assigned by experts. Experts have a chance to increase the coefficient of the data sets which they give more importance. For instance ODTÜ TEKNOKENT's priority is internationalization. Hence ODTÜ TEKNOKENT sets highest coefficient for income data sets.

At first, the data sets are needed to be transformed. There are several techniques for data transformation. In this study, min - max normalization method has been used. In order to get rid of the effect of outliers, minimum and maximum values of the data sets have been found out.

Secondly, the data sets are transformed to the indicators. For example, export values are proportioned to number of employees and annual turnover. Some other transformations examples are:

- Number of collaborations are proportioned to number of R&D projects
- R&D expenditures are proportioned to number of R&D employees and total expenditure
- Number of graduate employees are proportioned to number of R&D employees

The entire set of indicators are given in Table 5. The coefficient of the indicators might change according to STP's priorities. As mentioned above, ODTÜ TEKNOKENT set highest coefficient for income and internationalization indicators.

No	Criteria	Coefficient
1	**R&D Activity**	**20**
1.1.	The ratio of R&D employees to total employees number	
1.2.	The ratio of R&D expense to number of R&D employees	
1.3.	The ratio of R&D expense to total expenses	
1.4.	The ratio of R&D revenue to R&D expenses	
1.5.	The ratio of number of master graduate employees to total R&D	
2	***Collaboration***	**32**
2.1.	The ratio of ongoing projects that are under the cooperation of ODTÜ academicians to number of the total ongoing projects	
2.2.	The ratio of ongoing projects that are not under the cooperation of ODTÜ academicians to number of the total ongoing projects	
2.3.	The ratio of budget which transferred to academics to budget which transferred to the academicians in the technology center	
2.4.		
2.5.	The ratio of number of the partner academicians to number of the R&D employees	
2.6.	The ratio of number of the students to employees number	
2.7.	The ratio of number of interns to employees number	
2.8.	The ratio of ongoing projects with on-site ODTÜ TEKNOKENT cooperation to ongoing projects number	
3	***Intellectual Property Rights***	***12***
3.1.	The number of officially registered patents	
3.2.	The number of domestic patent applications	
3.3.	The number of officially registered international patents	
3.4.	The number of international patent applications	
4	***R&D Results and Internationalization***	***36***

4.1.	The ratio of export amount to employees number	
4.2.	The ratio of export to total endorsement	
4.3.	The ratio of R&D export amount to total export	
4.4.	The ratio of R&D revenue to total employees number	
4.5.	The ratio of R&D revenue to total endorsement	
4.6.	The ratio of R&D revenue to total exemption (SSI (soc. Sec. ins.) , VAT , corporation income tax, income tax)	

Table 9 ODTÜ TEKNOKENT Indicator Set

Then, the indicators are scaled between 0 and 1. Here, standard normalization techniques are used. The statistical formulas, which are used for normalization of the indicator sets, are shown below:

1. If Indicator Index > median of data set:

$$\text{Company Score} = \frac{50 + \left[50 * criteria\ value - median\right]}{\left(\max - median\right)}$$

2. If Indicator Index < median of data set:

$$\text{Company Score} = \frac{50 + \left[50 * criteria\ value - median\right]}{\left(median - \min\right)}$$

Table 6 shows last 8 quarters total score of some ODTÜ TEKNOKENT companies. The company names are not given because of the terms of usage of the data and privacy of statement.

Each expert deals with approximately 40 companies. They have a chance to analyze the results of the companies. It is very practical to identify the companies which have rising tendency.

Firm	2015-1	2015-2	2015-3	2015-4	2016-1	2016-2	2016-3	2016-4
xxx	32,3	35,9	19,3	49,8	49,7	53,0	52,3	50,2
xxx	16,9	18,7	2,4	26,4	8,0	40,5	40,8	41,0
xxx	41,4	41,1	21,6	40,3	41,3	41,0	41,5	40,4
xxx	14,0	13,3	4,7	20,4	23,5	35,8	38,4	39,1
xxx	12,5	11,6	18,2	22,8	18,9	22,6	31,0	37,7
xxx	14,3	20,9	3,8	29,3	15,1	38,3	38,3	36,4
xxx	26,2	26,6	19,5	24,2	27,3	27,2	36,8	35,2
xxx	8,9	11,7	1,6	11,2	35,0	32,3	31,0	35,1
xxx	32,6	31,5	21,0	33,6	36,0	38,7	37,1	34,8
xxx	22,8	35,1	19,5	34,3	37,7	36,1	36,7	34,4
xxx	33,8	35,3	25,6	34,3	38,4	37,1	34,7	34,0
xxx	34,2	33,6	21,3	32,6	33,0	33,4	33,7	33,3
xxx	12,3	14,1	20,3	39,0	38,8	38,9	34,0	32,8
xxx	7,1	11,5	16,8	33,3	14,8	33,2	33,2	32,5
xxx	25,7	28,1	17,9	28,7	31,1	31,3	33,0	31,6
xxx	11,6	28,1	17,2	35,6	41,6	30,0	31,5	31,5
xxx	10,4	16,1	4,3	12,7	11,5	24,3	25,2	31,3
xxx	32,9	32,2	21,3	31,6	31,2	32,2	32,4	31,3
xxx	34,6	36,8	25,5	38,4	33,7	34,5	37,0	30,6
xxx	29,1	30,3	19,4	32,7	32,5	32,4	31,7	30,2
xxx	21,4	21,5	11,1	24,9	31,5	29,8	30,5	30,1
xxx	33,0	31,1	19,3	30,1	29,9	29,4	30,1	30,0
xxx	10,1	9,7	1,7	10,4	21,5	21,2	21,3	29,9
xxx	15,1	24,7	2,4	24,7	14,9	28,6	30,2	29,8
xxx	40,7	36,5	21,8	38,9	32,8	31,1	33,6	29,8
xxx	26,6	26,2	17,7	28,5	22,8	26,8	29,5	29,7
xxx	23,6	27,0	12,6	26,9	31,4	31,5	30,8	29,6
xxx	31,3	33,2	18,3	32,9	18,7	28,7	32,3	29,6
xxx	30,1	29,7	18,0	30,8	24,6	31,7	33,3	29,4
xxx	26,9	26,2	17,2	25,8	32,1	28,1	27,9	29,2
xxx	27,7	26,2	18,2	25,5	28,8	31,7	31,4	29,0
xxx	30,0	29,2	19,8	30,8	27,5	27,6	28,3	29,0

Table 10 Company Score for Last 8 Quarters

It is also very beneficial to generate similar tables for 4 titles. Table 7 includes scores for Income for last 8 quarters.

Firm	2015-1 Income	2015-2 Income	2015-3 Income	2015-4 Income	2016-1 Income	2016-2 Income	2016-3 Income	2016-4 Income
xxx	6,5	6,0	12,1	16,1	8,2	11,7	18,1	24,2
xxx	21,0	20,5	21,0	21,0	21,7	24,7	23,5	21,4
xxx	18,4	18,9	19,3	21,1	21,8	22,3	23,0	21,2
xxx	25,0	22,5	21,6	21,5	21,3	21,4	21,6	20,8
xxx	23,5	25,0	25,6	24,0	27,0	26,4	24,0	20,7
xxx	22,3	21,9	21,3	21,2	20,9	21,1	21,1	20,5
xxx	1,8	2,0	2,4	3,2	0,0	21,3	20,9	20,3
xxx	19,4	20,1	19,5	19,9	21,3	21,5	21,7	20,2
xxx	20,9	22,1	21,3	21,1	19,7	20,0	20,6	20,2
xxx	2,1	1,5	1,7	2,1	13,4	13,0	13,2	20,2
xxx	0,1	4,7	3,8	12,1	0,0	21,2	21,1	19,9
xxx	15,5	17,9	17,9	17,6	19,5	19,7	20,8	19,7
xxx	22,0	19,8	19,3	19,0	19,2	18,8	19,4	19,4
xxx	2,4	2,6	20,3	20,9	20,7	20,9	18,6	19,3
xxx	21,8	23,7	25,5	24,7	22,5	22,9	25,5	19,3
xxx	16,8	17,0	17,2	17,7	20,8	19,2	19,1	19,1
xxx	1,2	16,4	17,2	18,8	18,1	13,9	19,3	19,0
xxx	18,5	19,8	18,3	18,8	8,0	17,7	20,8	18,1
xxx	17,4	18,7	18,7	18,5	18,2	18,7	18,5	17,9
xxx	9,2	20,0	19,5	19,9	21,2	19,7	20,2	17,9
xxx	4,4	4,2	4,7	11,2	14,3	15,0	17,1	17,9
xxx	18,7	19,3	18,8	18,6	19,0	20,3	18,5	17,8
xxx	17,7	19,1	19,4	18,7	18,5	18,3	18,2	17,7
xxx	9,6	8,2	11,1	12,3	18,9	17,1	17,3	17,2
xxx	17,9	17,4	19,8	18,9	16,0	15,9	16,3	17,1
xxx	14,3	19,0	19,5	19,2	15,5	16,5	17,7	17,0
xxx	1,2	19,2	18,9	18,0	16,7	15,6	16,8	16,8
xxx	18,4	18,3	18,0	18,3	13,0	18,8	19,2	16,7
xxx	9,3	13,4	12,5	12,2	11,0	13,4	14,1	16,4
xxx	4,6	4,8	4,7	4,6	4,7	16,0	16,3	16,0
xxx	2,0	2,3	8,0	7,4	19,7	19,0	17,5	15,6
xxx	13,2	13,7	13,7	13,5	15,7	15,9	16,2	15,6
xxx	0,0	5,1	5,1	1,6	1,5	8,6	18,7	15,6
xxx	2,0	4,8	16,8	17,9	0,0	16,0	15,9	15,4
xxx	3,1	5,2	4,9	11,9	10,0	15,4	15,2	15,3
xxx	17,6	17,6	17,7	17,0	11,1	13,4	14,2	15,1
xxx	19,2	17,8	18,2	17,1	16,7	16,2	16,0	15,0
xxx	0,6	2,4	1,6	1,5	13,8	12,5	11,2	14,8
xxx	11,6	14,4	12,6	10,8	13,8	14,4	13,6	14,5
xxx	3,5	3,1	3,2	3,2	3,9	3,7	3,6	3,6
xxx	3,4	3,3	3,3	3,2	3,7	3,6	3,6	3,6

Table 11 Income Scores for Last 8 Quarters

Figure 2 shows the change of Income scores for 5 scores. Company x and b have increased income scores dramatically in the last 2 years. They are probably two of the outstanding companies at ODTÜ TEKNOKENT. When ODTÜ TEKNOKENT experts checked these companies, they observe that these companies got investment last year and increased their overseas sales.

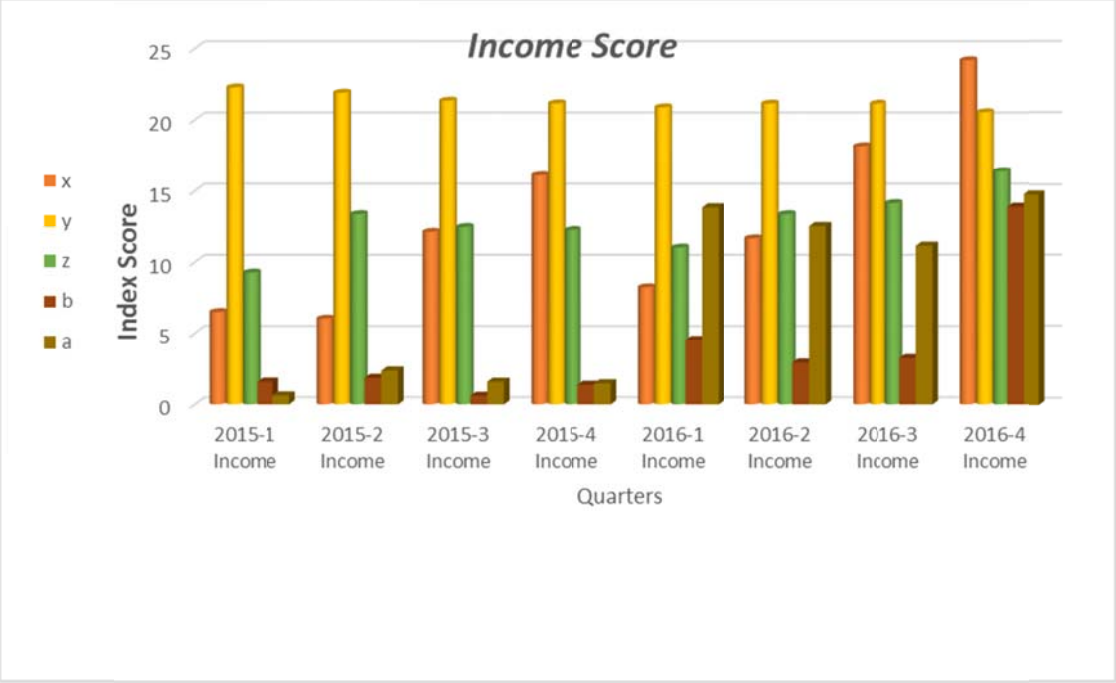

Figure 21 Income Score of 4 Companies

CONCLUSION

In conclusion, ODTÜ TEKNOKENT apply the evaluation system in order to follow up, analyze, support and help to accelerate its tenants' growth. Apart from being a beneficial tool for the tracking procedure, the evaluation system helps;

- To find out outperforming and underperforming companies located in the ecosystem
- To identify needs of companies
- To measure applicant companies' performances
-

Through this system, ODTÜ TEKNOKENT is able to rank companies according to their R&D and commercialization performances. Moreover, it gives clues to enhance the companies' performances through which eventually it can enhance its own performance and improve itself in order to guide companies' during their operational processes.

Tables

Figures

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