Entrepreneurship & Technology
Commercialization Report 2017:
Global Trends and Specific Look at Turkey
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Preface

The Technology Transfer Accelerator Turkey (TTA Turkey) - an initiative managed by the European Investment Fund (EIF) - aims to commercialize applied research from universities and scale up the technology transfer market in Turkey, with a particular focus on spill-overs to the country’s less developed regions.

Launched in 2014, TTA was designed by EIF in cooperation with the Ministry of Science, Industry and Technology, the Scientific and Research Council of Turkey, the Delegation of the European Union to Turkey and the DG Regional Policy of the European Commission. TTA Turkey is co-financed by the EU and the Republic of Turkey under the regional development component of the country's Instrument for Pre-Accession Assistance (IPA) funds. The Regional Development Component of IPA is managed by the Ministry of Science, Industry and Technology.

The term of TTA-Turkey Advisory Services Project is two years (December 2015 - December 2017), and the objective of the project is to improve the technical capacities of Technology Transfer Offices (TTOs) including those which are located in 12 NUTS II Regions of Turkey, to improve TÜBİTAK's capacity to commercialize R&D, and to support TTA-Turkey funds through networking activities in finding appropriate investment opportunities.

In this report, the current situation and global trends in entrepreneurship are stated. We have a specific look to Turkey by giving information about the entrepreneurship landscape, related statistics as well as observations and recommendations with regard to technology commercialization and the entrepreneurial ecosystem.
# Table of Contents

Preface ......................................................................................................................... 3

Table of Contents ........................................................................................................... 4

List of Figures .................................................................................................................. 5

List of Tables .................................................................................................................. 6

## Chapters

1. The Global Perspective .......................................................................................... 7
   1.1. Societal Attitudes and Perceptions About Entrepreneurship.................. 12
   1.2. Women Entrepreneurship ............................................................................. 13
   1.3. Venture Investing ............................................................................................ 16
   1.4. Effectiveness of Tax Incentives for Venture Capital and Business Angels... 20

2. Turkish Entrepreneurship Ecosystem ..................................................................... 23
   2.1. Venture Investing in Turkey ........................................................................... 25
       2.1.1. Additional Remarks .............................................................................. 27
   2.2. Government Programs ................................................................................... 29
   2.3. Universities, Technology Transfer Offices and Technoparks .................... 30
       2.3.1. Universities .......................................................................................... 30
       2.3.2. Technology Transfer Offices ............................................................... 30
       2.3.3. Technoparks ......................................................................................... 31
       2.3.4. Women Entrepreneurship ..................................................................... 32

3. Outputs and Achievements of the TTA Turkey Project ........................................... 33

4. Observations and Recommendations ..................................................................... 36

Appendix ....................................................................................................................... 40
# List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The 2017 Startup Ecosystem Ranking</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Some Analysis Based on 2018 GEI for Each Region</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Societal Attitudes and Perceptions About Entrepreneurship</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>Shares of Male and Female Startup Founders (Europe, UK and Austria)</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Percent of Female Entrepreneurs in Each Industry by Region</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>Global Venture Financing by Stage</td>
<td>17</td>
</tr>
<tr>
<td>7</td>
<td>Distribution of Global Venture Financing</td>
<td>17</td>
</tr>
<tr>
<td>8</td>
<td>Global Financing Trends</td>
<td>18</td>
</tr>
<tr>
<td>9</td>
<td>Global Median Pre-money Valuations ($M) by Series</td>
<td>18</td>
</tr>
<tr>
<td>10</td>
<td>Global Median Deal Size ($M) by Stage</td>
<td>19</td>
</tr>
<tr>
<td>11</td>
<td>Corporate VC Participation in Global Venture Deals</td>
<td>20</td>
</tr>
<tr>
<td>12</td>
<td>Top OECD Countries by Annual Average Real GDP Growth Rate (2003-2016)</td>
<td>23</td>
</tr>
<tr>
<td>13</td>
<td>Number of Patents Granted in Turkey (2006-2016)</td>
<td>25</td>
</tr>
<tr>
<td>14</td>
<td>Number of Patent Applications in Turkey (2006-2016)</td>
<td>25</td>
</tr>
<tr>
<td>15</td>
<td>Number of Scientific Publications in Turkey (2006-2016)</td>
<td>25</td>
</tr>
<tr>
<td>16</td>
<td>Venture Investments in Turkey (2010-2017)</td>
<td>26</td>
</tr>
<tr>
<td>17</td>
<td>Venture Investments by Stage in Turkey (2010-2017)</td>
<td>26</td>
</tr>
<tr>
<td>18</td>
<td>CVC Investments in Turkey (2010-2017)</td>
<td>27</td>
</tr>
<tr>
<td>19</td>
<td>Most Funded Verticals in 2017</td>
<td>27</td>
</tr>
</tbody>
</table>
### List of Tables

<table>
<thead>
<tr>
<th></th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Global Entrepreneurship Index 2018 (Top 20 Countries)</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>The Global Gender Gap 2017 Index (Top 20 Countries)</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>TTA Turkey Project Synopsis</td>
<td>33</td>
</tr>
<tr>
<td>4</td>
<td>Performance Metrics of Accelerators</td>
<td>38</td>
</tr>
</tbody>
</table>
Entrepreneurship & Technology

Commercialization Report 2017:

Global Trends and Specific Look at Turkey

1. The Global Perspective

Entrepreneurship is an important source of employment creation and innovation as well as sustainable economic growth. As this is understood, the importance given to entrepreneurship by countries increases each passing day. Here are some highlights from around the globe showcasing the relationship between startups and economic development:

- According to the OECD, in all OECD countries, around two-thirds of all jobs were created by new firms in 2014.¹
- When we look at the data for Europe overall, we see that startups provide around 50% of all new jobs.²
- Small businesses continue to play a vital role in the economy of the United States. The number of jobs created by establishments less than 1 year old was 3 million in 2015 in the USA. Small businesses produced 46 percent of the private nonfarm GDP in 2008 (the most recent year for which the source data is available).³
- As of 2015, small businesses employed over 8.2 million individuals in Canada, or 70.5 percent of the total private labor force.⁴

According to the European Commission, Europe’s economic growth and jobs depend on its ability to support the growth of enterprises. The most important sources of employment in the EU are Small and Medium-sized Enterprises (SMEs). Therefore, the Commission’s objective is to encourage people to become entrepreneurs and also make it easier for them to set up and grow their businesses.⁵ The Entrepreneurship 2020 Action Plan that was presented by The Commission aims to facilitate the creation of new businesses and to create a much more supportive environment for existing entrepreneurs to thrive and grow. There are also special sub-programs on entrepreneurship under the Commission’s Horizon 2020 Program. The Commission is trying to keep entrepreneurship one of the most important agenda items in Europe.

¹ http://www.oecd.org/std/business-stats/
³ http://sbecouncil.org/
⁵ https://ec.europa.eu/growth/smes/
In his book “Startup Communities”, Brad Feld who is a well-known entrepreneur and venture capitalist states that it takes about 20 years to develop a vibrant entrepreneurial ecosystem. 6 Indeed, creating a sustainable entrepreneurial ecosystem requires a lot of effort, dedication, resources, time and a change in mindset.

Startup Genome which is a global collaborative effort to help regions everywhere nurture and maintain thriving tech startup ecosystems, published their annual report to rank the startup ecosystems globally. As emphasized in the report, in order for more startups around the world to thrive we need to understand the underlying influences of startup ecosystems’ success. 7 The index is produced by ranking ecosystems along five major components:

- **Performance**: Startup output, exits, valuations, early-stage success, growth-stage success, overall ecosystem value
- **Funding**: Access through metrics of total and per startup early-stage investments as well as growth in early-stage investments, funding quality through the presence of experienced VC firms
- **Talent**: Access, cost, and quality of talent. The Access sub-factor includes the proportion of software engineers and growth employees with two or more years of experience at a prior startup, the time required to hire an engineer, and the ability to obtain a visa for hires from abroad
- **Market Reach**: Global connectedness and global and local reach, based on the startups’ proportion of foreign customers and the national GDP
- **Startup Experience**: Team Experience and Ecosystem Experience. The former is based on founder hyper-growth or unicorn experience, advisors with equity, and startups providing options to all their employees. Option grants to employees reflect a founder’s knowledge of aligning incentives, as well as whether employees value stock options, indicating a strong startup culture in the ecosystem. Ecosystem Experience is based on the number of exits above $50 million achieved within the last 10 years.

It is worth noting this year Startup Genome added the following dimensions to their ranking: Global Connectedness, Resource Attraction and Leakages, Founder Ambition, Founder Go-Global Strategy and Corporate Involvement.

Startup Genome assessed 55 startup ecosystems across 28 countries and ranked the top 20. The ranking is primarily driven by one question: in which ecosystems does an early-stage startup have the best chance of building a global success? Here are top 20 startups ecosystems around the world.

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6 Brad Feld, Startup Communities: Building an Entrepreneurial Ecosystem in Your City (Wiley, 2012)
7 [https://startupgenome.com/about-us/](https://startupgenome.com/about-us/)
As we see from the Figure 1, Silicon Valley continues to dominate overall whereas New York City keeps its spot from last year as the #2. Beijing, Shanghai and Stockholm are the newcomers and it is impressive to see Beijing take the #4. We are likely seeing the advent of a significant Chinese presence on the global startup stage. Los Angeles and Chicago moved lower several spots and we see that Chicago is not in the top 10 anymore. Considering the popularity of the Los Angeles Startup Ecosystem last year, it is surprising to see that it moved down 6 spots. According to the report, in both cases, this downward movement was driven by relatively low scores on Global Connectedness. It seems like Global Connectedness will play a key role for the startup ecosystems since there is an increasing trend for startups to become global. According to European Startup Monitor, 77.7% of the startups in Europe are planning internationalization.

London takes the #3 by climbing several spots up and keeps its popularity as the top European startup ecosystem. It is impressive for London to keep its place in the Index despite Brexit. While Brexit has yet to materialize negatively for Britain, the 2018 Index might reveal impacts. We see Berlin moved up 2 spots to #7 whereas Paris kept its place as #11. As we will address in later chapters, Paris is the only European city that saw increased VC investments last year. It would not be surprising if we see Paris climbing the Index in the years ahead.

Another important Index is The Global Entrepreneurship Index (GEI) which is a composite indicator of the health of the entrepreneurship ecosystem in 137 countries.
prepared by The Global Entrepreneurship and Development Institute. The GEI measures both the quality of entrepreneurship and the extent and depth of the supporting entrepreneurial ecosystem. Here are the top 20 countries in the GEI:

<table>
<thead>
<tr>
<th>Global rank</th>
<th>Country</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>United States</td>
<td>83.6</td>
</tr>
<tr>
<td>2</td>
<td>Switzerland</td>
<td>80.4</td>
</tr>
<tr>
<td>3</td>
<td>Canada</td>
<td>79.2</td>
</tr>
<tr>
<td>4</td>
<td>United Kingdom</td>
<td>77.8</td>
</tr>
<tr>
<td>5</td>
<td>Australia</td>
<td>75.5</td>
</tr>
<tr>
<td>6</td>
<td>Denmark</td>
<td>74.3</td>
</tr>
<tr>
<td>7</td>
<td>Iceland</td>
<td>74.2</td>
</tr>
<tr>
<td>8</td>
<td>Ireland</td>
<td>73.7</td>
</tr>
<tr>
<td>9</td>
<td>Sweden</td>
<td>73.1</td>
</tr>
<tr>
<td>10</td>
<td>France</td>
<td>68.5</td>
</tr>
<tr>
<td>11</td>
<td>Netherlands</td>
<td>68.1</td>
</tr>
<tr>
<td>12</td>
<td>Finland</td>
<td>67.9</td>
</tr>
<tr>
<td>13</td>
<td>Hong Kong</td>
<td>67.3</td>
</tr>
<tr>
<td>14</td>
<td>Austria</td>
<td>66.0</td>
</tr>
<tr>
<td>15</td>
<td>Germany</td>
<td>65.9</td>
</tr>
<tr>
<td>16</td>
<td>Israel</td>
<td>65.4</td>
</tr>
<tr>
<td>17</td>
<td>Belgium</td>
<td>63.7</td>
</tr>
<tr>
<td>18</td>
<td>Taiwan</td>
<td>59.5</td>
</tr>
<tr>
<td>19</td>
<td>Chile</td>
<td>58.5</td>
</tr>
<tr>
<td>20</td>
<td>Luxembourg</td>
<td>58.2</td>
</tr>
</tbody>
</table>

Table 1: The Global Entrepreneurship Index 2018 (Top 20 Countries)

Here are some highlights based on the The Global Entrepreneurship Index 2018:

- Globally, GEI scores have improved by 3% on average since last year’s Index.
- In the 2018 GEI, the Asia-Pacific region on average scores best in Product Innovation. The region is also strong in Human Capital.
- Europe shows stable high scores in Technology Absorption and Internationalization, and region’s average score on Startup Skills has recently climbed into the same league.
- The Middle East and North Africa region demonstrates strength in Product Innovation and Risk Capital.

8 https://thegedi.org/2018-global-entrepreneurship-index/
• North America’s strongest areas are Opportunity Perception and Risk Acceptance

• South / Central America and the Caribbean is strongest in the areas of Startup Skills and Product Innovation

• Sub-Saharan Africa shows greatest strength in Opportunity Perception.

• Globally, we’ve seen a 22% increase in Product Innovation scores since the 2017 GEI, and an 11% increase in Startup Skills scores since the 2017 GEI. This suggests that the global population is becoming more educated and identifying more opportunities to create new products.

Figure 2 shows some analysis and recommendations from the Report for regions:
1.1. Societal Attitudes and Perceptions About Entrepreneurship

As we stated before, the importance given to entrepreneurship by countries is increasing. As a result, societal attitudes and perceptions are changing in a positive way globally. This is important since in most countries, social norms and cultural challenges have been one of the main obstacles to entrepreneurship. The positive or negative perceptions that society has about entrepreneurship have a strong influence on the entrepreneurship.9

![Figure 3: Societal Attitudes and Perceptions About Entrepreneurship](image)

According to the GEM Report; in the 61 economies where the survey was conducted, working-age adults in efficiency-driven economies are most likely to see entrepreneurship as a good career choice. On average, two-thirds of the adult population in these economies consider starting a business a good career choice, compared to around 60% in the factor- and innovation-driven economies (Figure 3). More than two-thirds of the adult population, across all three phases of economic development, believe that entrepreneurs are well-regarded and enjoy high status within their societies.

Based on the results of the survey, it is worth mentioning that Europe reports the lowest rates of opportunity and capability perception, as well as the lowest entrepreneurial intentions (12%). Less than 40% of Europeans perceive opportunities in their area, and less than half believe they have the skills to pursue entrepreneurial opportunities. The European Commission is putting a lot of effort to foster and strengthen entrepreneurship in Europe but it seems there is room for further policy actions.

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9 http://www.gemconsortium.org/report/49812
In terms of demographics, the overall age pattern for entrepreneurship shows the highest participation rates among the 25–44 year olds, people in their early and mid-careers which is exactly the same from last year. According to the report, the prevalence of early-stage entrepreneurial activity is relatively low in the 18 – 24 years cohort, and shows the sharpest decrease after the age of 54.

1.2. Women Entrepreneurship

Women entrepreneurs contribute substantially to economic growth even though they have struggled to access to capital and have to contend with social constraints. In order to have sustainable economies, we have to work on addressing the gender gap and inequalities.

Every year, The Global Gender Gap Index is published by the World Economic Forum as a framework for capturing the magnitude of gender-based disparities and tracking their progress over time. The Index benchmarks national gender gaps on economic, education, health and political criteria, and provides country rankings that allow for effective comparisons across regions and income groups. In the Global Gender Gap 2017 Index, 144 countries are covered. Top 3 countries on the Index are: Iceland, Norway and Finland. Here are the top 20 countries in the Index among 144:

<table>
<thead>
<tr>
<th>Country</th>
<th>Economic Participation and Opportunity</th>
<th>Educational Attainment</th>
<th>Health and Survival</th>
<th>Political Empowerment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iceland</td>
<td>1</td>
<td>15</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Norway</td>
<td>2</td>
<td>9</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Finland</td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Sweden</td>
<td>4</td>
<td>7</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Germany</td>
<td>5</td>
<td>12</td>
<td>37</td>
<td>9</td>
</tr>
<tr>
<td>Netherlands</td>
<td>6</td>
<td>54</td>
<td>34</td>
<td>2</td>
</tr>
<tr>
<td>Latvia</td>
<td>7</td>
<td>68</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ireland</td>
<td>8</td>
<td>50</td>
<td>1000</td>
<td>6</td>
</tr>
<tr>
<td>New Zealand</td>
<td>9</td>
<td>700</td>
<td>43</td>
<td>12</td>
</tr>
<tr>
<td>Philippines</td>
<td>10</td>
<td>700</td>
<td>36</td>
<td>13</td>
</tr>
<tr>
<td>France</td>
<td>11</td>
<td>64</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Germany</td>
<td>12</td>
<td>700</td>
<td>54</td>
<td>10</td>
</tr>
<tr>
<td>Namibia</td>
<td>13</td>
<td>777</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>Denmark</td>
<td>14</td>
<td>775</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>15</td>
<td>775</td>
<td>1000</td>
<td>17</td>
</tr>
<tr>
<td>Canada</td>
<td>16</td>
<td>775</td>
<td>1000</td>
<td>17</td>
</tr>
<tr>
<td>Bolivia</td>
<td>17</td>
<td>775</td>
<td>1000</td>
<td>17</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>18</td>
<td>775</td>
<td>1000</td>
<td>17</td>
</tr>
<tr>
<td>South Africa</td>
<td>16</td>
<td>775</td>
<td>1000</td>
<td>17</td>
</tr>
<tr>
<td>Latvia</td>
<td>20</td>
<td>775</td>
<td>1000</td>
<td>17</td>
</tr>
</tbody>
</table>

Table 2: The Global Gender Gap 2017 Index (Top 20 Countries)

Based on the notable recent estimates, the Report suggests that, economic gender parity could add an additional US$250 Billion to the GDP of the United Kingdom, US$1,750 Billion to that of the United States, US$550 Billion to Japan’s, US$320 billion to France’s and US$310 Billion to the GDP of Germany. Other recent estimates suggest

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that China could see a US$2.5 Trillion GDP increase from gender parity and that the world as a whole could increase global GDP by US$5.3 Trillion by 2025 by closing the gender gap in economic participation by 25% over the same period.

OECD’s Entrepreneurship at a Glance 2017 Report is another study that provides data and insights on women entrepreneurship. According to the report, a gender gap is observed in all OECD countries also among young self-employed, i.e. individuals less than 30 years old. In 2016, only in Chile and Mexico the self-employment rate of women was slightly higher than that of men. In 2014, self-employed women earned 10% less than men in Luxembourg and Lithuania, but almost 60% less than men in Poland, the United States and Romania.

Another study which was conducted by European Startup Monitor (ESM) with 2,515 startups, 6,340 founders and 23,774 employees in Europe reveals notable statistics about women entrepreneurship. The report shows that the share of male startup founders in Europe remains almost constant at 85.2%, while 14.8% are female. These percentages were 85.3% and 14.7% respectively in 2015. However, there are differences between countries. The countries with the highest percentage of female founders are the United Kingdom (33.3%), Greece (28.4%) and Ireland (23.3%), while countries such as Austria (7.1%), Switzerland (10.7%) and Belgium (11.1%) have the lowest percentages of female founders.

When we look at the domains where women entrepreneurs start their own business, we see that most participation among female entrepreneurs is in wholesale/retail. Women entrepreneurs are less likely to be seen in the information and communications technology (ICT) sector. Overall, fewer than 2% are starting ICT businesses. Gender gaps are widest in ICT, where women compete at one-third the level of men on average, and in government/health/ education and social services, where women compete two and one-fourth times more than men. Figure 4 shows the percent of female entrepreneurs in each industry by region.

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12 http://europeanstartupmonitor.com/
Women have disadvantages in the investment domain as well. Statistics show that women have more difficulties getting funded by male-dominated VC firms. According to the Crunchbase Women in Venture Report which was published in October 2017, only 10 percent of venture dollars globally between 2012 and Q3 2017 went to startups with at least one woman founder.\textsuperscript{14}

According to a study conducted by the well-known San Francisco based venture capital firm First Round Capital using a data set of 300 companies, companies they invested in that had a female founder performed 63% better than companies they invested in that had all-male founding teams.\textsuperscript{15} It is worth remembering the well-known Harvard Business School study in which investors chose businesses presented by males 68.3% of the time. In the study only 31.7% of investors chose to fund the ventures whose pitches were presented by females.\textsuperscript{16}

The gender gap also exists when it comes to number of women in VC firms. Crunchbase Women in Venture Report states that just 8 percent of partners at top 100 venture firms are women.

Women entrepreneurship has come a long way but there is still much room for improvement.

\textsuperscript{15} http://10years.firstround.com/
\textsuperscript{16} http://www.hbs.edu/faculty/PublicationFiles/Brooks%20Huang%20Kearney%20Murray_59b551a9-8218-4b84-be15-eaff808097a7.pdf
1.3. Venture Investing

Angel investors and Venture Capital Funds are the blood of the startup ecosystem. In this section, we will look at the angel and VC investment amounts globally, median size of deals in different stages, corporate venture capital investments, and investment trends.

The total amount of global venture financing rose to $155 Billion in 2017 compared to $127 Billion in 2016. Following 2015’s peak funding levels, 2016 was a challenging year for venture capital investment across the globe, with decreases in both the number of deals and the total value of VC investment. According to the report on global VC trends published by KPMG Enterprise, 2017 was the year of recovery. Here are some highlights from the study:

- Global median deal size rose for every deal stage in 2017, with the median deal size of angel and seed deals rising to $1 million from $800,000, early stage deals rising to $5 million from $3.7 million, and later stage deals rising to $10.8 million from $9.5 million.

- VC investments in the U.S. rose to $83 Billion.

- Pharmaceuticals and biotechnology saw a massive year-over-year increase in VC investment, from $12.2 billion in 2016 to $16.6 billion in 2017.

- VC investment in artificial intelligence and machine learning doubled from $6 billion in 2016 to $12 billion in 2017. AR/VR also saw significant interest from investors globally throughout 2017.

- IPO activity globally remained relatively slow compared to previous years.

- In 2017, there were 93 fundings of current and newly minted unicorns (companies with a valuation over $1 billion) created, exceeding the 77 fundings during 2016.

- 2017 saw a significant increase in interest in alternative financing mechanisms, particularly Initial Coin Offerings (ICOs). There was a substantial increase in the number of ICOs in 2017, ICOs raised over $2 Billion in capital.

Another trend that is seen in the venture investing in 2017 was that investors prefer to invest larger amounts in fewer deals. In other words, the “spray and pray” approach lost popularity.

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In another study, we see the distribution of global venture financing per capita\(^1\). We see Israel as the leading country when the investment amount is proportioned to population.

\(^1\)Dealroom.co
When we look at the global financing trends for VC-backed companies by sector, we see that software unsurprisingly dominates the list. It can be noted that Consumer Goods lost popularity where pharma and biotech have been resilient.

It is expected that AI and blockchain will be the top two domains under software in 2018.

Figure 8: Global Financing Trends

When we look at the global median pre-money valuation by series, we see that at close to $300 Million the median pre-money valuation for Series D or later financings has never been higher. Such high valuations are believed to be one of the main reasons companies choose to stay private instead of going public.

Figure 9: Global Median Pre-money Valuations ($M) by Series

Global median deal size rose for every deal stage in 2017, with the median deal size of angel and seed deals rising to $1 Million from $800,000, early stage deals rising to $5 Million from $3.7 Million, and later stage deals rising to $10.8 Million from $9.5 Million.

As mentioned earlier, another trend is the increased participation of Corporate Venture Capital ("CVC") Firms. The CVC scene has become more exciting with the $100 Billion Softbank Vision Fund. Corporations are important stakeholders in the startup ecosystem, therefore it is promising to see more corporate venture funds becoming active. Startup ecosystems are stronger when corporations collaborate with and acquire startups.
We see the same trend in Europe. According to the European Startup Monitor, sales and customer acquisition continue to be the biggest challenges startups are facing in Europe. This trend is expected to help startups to have corporations by their side for the market penetration.

1.4. Effectiveness of Tax Incentives for Venture Capital and Business Angels

As stated before, the importance given to entrepreneurship by countries globally increases every passing day. Entrepreneurship has become an important topic for policy makers as well. Many countries have launched tax incentive mechanisms for angel investors and venture capital firms. The main purpose of these tax incentive schemes is to encourage investors to put their money in startups by partially reducing the risk and cost of venture investing.

According to the Angel Capital Association, 29 states in the U.S. have tax incentive programs for angel investors. 20 When we look at Europe, we see that eleven EU Member States have tax incentive schemes for venture capitalist and angels.

In order to have successful entrepreneurship policies, it is important to measure the effectiveness of the support programs and tax incentive schemes. In June 2017, the European Commission published a Report named “Effectiveness of tax incentives for

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https://www.angelcapitalassociation.org/aca-public-policy-state-program-details/
venture capital and business angels to foster the investment of SMEs and start-ups. The aim of the Report is to measure the effectiveness of the tax incentive programs in EU-28, the U.S., Canada, Japan, South Korea, Turkey, Australia, Switzerland and Israel, and to identify benchmark programs as well as good practices among them. Key findings from the Report are below:

- In total, 46 tax incentives are offered by these countries, with 13 countries operating multiple schemes. France and the United Kingdom have the most sophisticated frameworks of tax incentives, operating six schemes each.
- Tax credits in respect of the amount invested are the most popular form of incentive, followed by tax exemptions on the returns (current or capital) generated by the investment.
- Investor targeting is mixed, with 28 schemes targeting individual investors, 10 schemes targeting corporate investors and 8 schemes targeting both.
- The majority of schemes permitted the participation of cross-border investors providing they had sufficient tax liabilities in the country in question to absorb the tax relief.

**Top 5 tax incentive programs among EU-28, the U.S., Canada, Japan, South Korea, Turkey, Australia, Switzerland and Israel:**

1- The United Kingdom’s Seed Investment Scheme (SEIS) is the highest ranked tax incentive. SEIS uses a combination of age, size and specific sector exclusions to target entrepreneurial firms. It restricts the participation of related parties, but has introduced allowances for business angels. It targets newly issued ordinary share capital, imposing a maximum investment value attracting tax relief and a minimum holding period.

2- The United Kingdom’s Enterprise Investment Scheme (EIS) comes in second place. The scheme offers upfront tax relief and provides loss relief on a more favorable basis than allowed by the baseline tax system. It targets entrepreneurial firms on the basis of size and excluded sectors, but does not use age targeting. It has introduced allowances to related party restrictions to permit the involvement of business angels.

3- France’s “Madelin” tax reduction scheme features third in the ranking. The scheme offers an upfront tax credit of 18% on investments, as well as granting relief for gains realized on disposal of qualifying investment. The scheme restricts participation through its partial targeting of business size, age and sector. In addition, it imposes a minimum holding period of five years and a maximum investment allowance that is eligible for relief.

4- The United Kingdom’s Social Investment Tax Relief (SITR) comes in fourth place. The scheme offers upfront tax relief but does not provide loss relief on a more favorable basis than allowed by the baseline tax system. Although SITR is very similar in design to EIS, its qualifying criteria score diverges as it specifically targets

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social enterprises and does not contain allowances to permit the involvement of business angels.

5- Germany’s Venture Capital Grant (Invest) incentive is ranked in joint fifth place. The scheme offers both individual and corporate investors an upfront relief in the form of a grant of 20% of the investment sum on the acquisition of shares. There is also an exit relief that applies to individual investors only.

The United Kingdom’s Venture Capital Trust (VCT) scheme is also ranked in joint fifth place. The VCT scheme offers upfront relief and relief on gains for investors, as well as tax transparent treatment of investment returns for the VCT itself.

The Report also selects 10 good practice cases based on novel and promising approaches and the diversity of approaches. Here are the selected 10 good practice cases:

1- Venture Capital Grant (Invest) - Germany
2- Employment and Investment Incentive Scheme, Ireland
3- Tax Treatment of Crowdfunding Loans, Belgium
4- “Madelin” Tax Reductions, France
5- Angel Tax System, Japan
6- Venture Capital Trust, United Kingdom
7- Social Investment Tax Relief, United Kingdom
8- Venture Capital Limited Partnership program, Australia
9- Tax Shelter for Investments in Start-ups, Belgium
10- Business Angel Scheme, Turkey

The OECD also published a report addressing the tax incentive programs for venture investing\(^\text{22}\). In this report the OECD highlights that capital gains tax is also an important factor that shapes the seed and early stage equity market as it will influence the investment and exit decisions by angel investors and venture capitalists. Despite a flight to quality selection effect, higher capital gains tax rates reduce both the number of VC-backed and successful companies. Beyond the arguments that increased taxation reduces the incentives to invest in seed and early stage ventures, capital gains taxes have also been argued to work as a barrier to entrepreneurial activity and creation of new firms.

2. Turkish Entrepreneurship Ecosystem

Turkey has a tremendous potential in entrepreneurship with its young and educated workforce as well as its strategic location between key markets in Europe, the Middle East, Russia and Central Asia. To understand that potential, here are some recent statistics about Turkey:

- With a GDP of around $860 Billion, Turkey is the 17th-largest economy in the world and the 6th largest economy within the broader EU community.\(^{23}\)
- Turkey’s population is 79.8 Million as of December 2016 and the median age is 31.4.\(^{24}\)
- The percentage of Internet users reached 66.8% of the total population.
- The mobile industry in Turkey continues to grow rapidly, with 76.6 Million subscribers as of June 2017, representing a 95.9% market penetration rate.
- Turkey’s economy grew at an annual average real GDP growth rate of 5.6 percent from 2003 to 2016\(^ {25}\).

![Figure 12: Top OECD Countries by Annual Average Real GDP Growth Rate (2003-2016)](http://pubdocs.worldbank.org/en/254861507539327826/Turkey-Snapshot-Fall2017.pdf)

R&D is a crucial component of innovation in knowledge-based economies. According to the results of R&D Activities Survey 2016 conducted by TurkStat\(^ {26}\), gross domestic expenditure on research and development surpassed 24.5 Billion TL in Turkey in 2016, an increase of 19.5% compared to the previous year. Share of gross domestic expenditure on research and development in GDP reached 0.94% in 2016. The total number of full time equivalent (FTE) R&D personnel was 136,953 where the ratio of female R&D personnel was 31.4%.

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\(^{24}\) http://www.turkstat.gov.tr/HbGetirHTML.do?id=21507


\(^{26}\) http://www.turkstat.gov.tr/
The number of patents granted by the Turkish Patent Institute was 11,074 whereas the number of patent applications to the Turkish Patent Institute was 16,778 in 2016. The number of scientific publications in 2016 was 31,555.²⁷
Having a quick process to start a new business is very important for startups. According to the OECD’s “Starting a Business Rank 2018” where economies are ranked on their ease of doing business, from 1–190, Turkey’s rank is 60 out of 190. Compared to the previous year’s ranking of 78, it is clear that there is a positive change but still room to improve.

According to The Global Entrepreneurship Index 2018, an annual index that measures the health of the entrepreneurship ecosystems in each of 137 countries, Turkey holds the rank of 37.

2.1. Venture Investing

The Turkish Entrepreneurship Ecosystem is relatively young but it has been developing rapidly. In this section, statistics with regard to venture investing will be stated. The recent ecosystem map can be found in the Annex A.

Here are some statistics about the ecosystem as of January 2018:

- Number of accredited angel investors in Turkey: 428
- Number of Business Angels Networks: 15
- Number of Incubation Centers and Accelerators: 41
- Number of Early Stage VC Firms: 29
- Number of Private Equity (PE) Firms: 7
- Number of R&D Centers: 770
- Number of Technoparks: 55
- Number of Technology Transfer Offices: 63
- Number of Crowdfunding Platforms: 6
- Number of NGOs that are actively work in entrepreneurship: 18

According to StartupsWatch, the total investment amount reached $177 Million in Turkey in 2017. Figure 16 shows the venture investment amounts in Turkey by year and Figure 17 shows the venture investments by stage.

As it can be seen from Figure 17, seed stage investments dominate venture investing in Turkey. It can be also noted that the seed stage investments almost doubled in 2017 compared to 2016. Another remarkable note is that Series C investments were $15 Million in 2017 (There were not any Series C investments in 2016). This is an indicator that the ecosystem is maturing.

29 https://thegedi.org/2018-global-entrepreneurship-index/
30 https://startups.watch/
31 https://m.hazine.gov.tr/File/Index?id=E317E3E8-BA94-4D1D-9D55-F82E20295470
32 https://btgm.sanayi.gov.tr/DokumanGetHandler.ashx?dokumanId=407ad0ee-c332-461b-adaa-303396d50ca4
33 https://teknopark.sanayi.gov.tr/
34 https://startups.watch/
As it is mentioned before, the share of corporate investments is getting higher year by year globally. When we look at the data for Turkey, we see that the trend is similar. 2017 was a record year for corporate investments in Turkey with a share of 7.6% of the venture investing.
When we look at the most funded verticals, we see that Fintech takes the lion’s share with 18% of all investments in 2017.

2.1.1. Additional Remarks

The Turkey Technology Accelerator Funds – ACT VC and DCP VC played an important role both in 2016 and 2017 with their investments. The two funds’ contributions to the venture investing affected the total investment amounts directly in both 2016 and 2017.
Other highlights from 2016 and 2017 are below:

- Mediterra Capital sold down its stake in enterprise software business Logo Yazilim in November 2016, in the first exit a private equity firm has ever made to the Turkish public markets.\(^\text{35}\)
- A real estate services company Evtiko secured a total of ~ $18.3 Million in 3 investment rounds in January 2016, September 2016 and June 2017.
- Turkish online payment and fintech company Iyzico has secured $15 Million in Series C funding. Vostok Emerging Finance led the round with participation from International Finance Corporation, Amadeus Capital Partners and Turkish Venture Fund 212 in January 2017.
- PE Firm Turkven and VC Firm Earlybird bought the majority shares of the enterprise software company Mikro Yazilim in April 2017.
- One of the first private shopping platforms Markafoni was acquired by Select Group for $15 Million in July 2017.
- In July 2017 Amazon announced that it will enter the Turkish market. The e-commerce giant is expected to start its operations in Turkey in 2018.\(^\text{36}\)
- The San Francisco-based online gaming pioneer Zynga acquired the mobile card game copyright from Turkish game company Peak Games for $100 million in November 2017.
- Sojern, a San Francisco based company has acquired Turkish Adphorus, ad-tech company in November 2017.
- Tasit.com was acquired by Garajsepeti.com in December 2017.

The top acquisitions to date at or above $100M are:

1- Yemeksepeti.com
2- Gittigidiyor.com
3- Markafoni.com
4- Pozitron
5- Peak Games

All of these acquisitions are important milestones for the ecosystem for two main reasons:

1- A study that was published in HBR Turkey that found that Nevzat Aydin (a co-founder of Yemeksepeti.com), Sina Afra (a co-founder of Markafoni), and Hakan Baş (a co-founder of Lidyan.com) were key role models for young Turkish entrepreneurs.\(^\text{37}\) Each of these entrepreneurs had successful exits. These exits have given courage and inspiration to young entrepreneurs who want to be successful. Having successful role models is especially important in entrepreneurship. Moreover, since the acquirers are all outside from Turkey, young entrepreneurs understand that if they create strong and viable businesses, they can attract attention from a global audience.

\(^{36}\) https://www.dailysabah.com/technology/2017/08/31/amazons-website-for-turkey-operations-revealed
\(^{37}\) http://hbrturkiye.com/dergi/saglam-girisim
2- Co-founders of all these startups have become angel investors and mentors. This is very important for the sustainability and for the improvement of the ecosystem.

2.2. Government Programs

Thanks to The Ministry of Science, Industry and Technology, TÜBİTAK and The Small and Medium Enterprises Development Organization (KOSGEB); entrepreneurs are supported and encouraged in Turkey. There are different support programs for the different stages of startups. We covered these support programs in our report in 2016 which can be still downloaded from The Technology Transfer Accelerator - TTA Turkey Website\(^{38}\). Therefore, we will not cover the related programs here again. Instead we will focus on the Angel Investment Tax Incentive since it was selected as one of the good practices among 46 programs in EU-28, the U.S., Canada, Japan, South Korea, Turkey, Australia, Switzerland and Israel by the European Commission.

The tax incentive that is provided by the Under secretariat of Treasury for angel investors aims to encourage angel investors to invest in early stage startups. In practice, the Turkish Treasury licenses business angels who want to benefit from tax incentives for their investments. Accordingly, 75% of the participation shares of qualifying Turkish resident joint stock companies held by angel investors can be deducted from the angel investors’ annual income tax base in the calendar year. That deduction ratio is applied as 100% for those angel investors investing into the companies whose projects are supported by the Ministry of Science, Industry and Technology, TÜBİTAK as well as the Small and Medium Enterprises Development Organization in the last 5 years. The vast majority of the accredited angel investors say the incentive program was effective on their decision on becoming an angel investor.\(^{39}\)

In this year’s report, it is also worth mentioning that TÜBİTAK is working on revising its 1514 Venture Capital Support Program. The revised Program is supposed to be launched in Q1 2018. TÜBİTAK has been gathering feedback on the draft version of the revised Program from universities, technoparks, NGOs and venture capitalists. The efforts of TÜBİTAK to create a well-designed and effective Program by gathering the feedback of related stakeholders are appreciated by the ecosystem. We believe that the revised Program will be one of the most important agenda items in the ecosystem in 2018.

\(^{38}\) https://www.ttaturkey.org

\(^{39}\) www.treasury.gov.tr
2.3. Universities, Technology Transfer Offices and Technoparks

2.3.1. Universities

According to the Council of Higher Education, there are 185 universities in Turkey as of December 2017. Every year, TÜBİTAK announces The Entrepreneurial and Innovative University Index. The aim of the Index is to increase entrepreneurship and innovation oriented competition between universities, to measure the performance of universities regarding entrepreneurship and innovation, and to contribute the development of entrepreneurship and innovation indirectly. TÜBİTAK leads the evaluation process and announces the Index every year. Some indicators that are used in the calculations are:

* Number of firms established by academicians,
* Number of firms established by students/graduated students
* Employment in those firms
* Patents
* Licenses
* R&D and innovation projects
* Entrepreneurship, innovation lessons/trainings

Here are the most entrepreneurial and innovative universities in Turkey according to The Entrepreneurial and Innovative University Index 2017:

1. Sabancı University
2. Middle East Technical University
3. Gebze Technical University
4. İstanbul Technical University
5. Boğaziçi University
6. İhsan Doğramacı Bilkent University
7. Koç University
8. İzmir High Technology Institute
9. Özyeğin University
10. Yıldız Technical University

2.3.2. Technology Transfer Offices

Technology Transfer Offices (TTO) are quite important since they assist public research organizations in managing their intellectual assets in ways that facilitate their transformation into benefits for society. There are more than 60 TTOs in Turkey of which 34 were supported by TÜBİTAK through the grant program 1513 Technology

Transfer Support Program and the 1601 Capacity Building for Innovation and Entrepreneurship Grant Program.\textsuperscript{41}

The support amount that was given from TÜBİTAK to selected TTOs was about 20 Million TL in 2017, according to a study on the analysis of the TTOs that are supported through 1513 Technology Transfer Support Program.\textsuperscript{42} Another highlight from the study shows that most of the TTOs still do not generate enough revenue to cover their operational costs. The study also offers recommendations for TTOs’ effectiveness that can be found in the “Technology Transfer Book of Knowledge with Turkish TTO Good Practices” which is another valuable output of the TTA Turkey Project. The Book aims to provide practical, relevant, creative, and proven best practices from TTOs across IP intake processing, technology licensing, supporting startups, access to funding, Industry/University collaboration and much more. The Book can be downloaded from the TTA Turkey website.

2.3.3. Technoparks

According to Law No: 4691 regarding Technology Development Zones (TDZs), a technopark hosts high tech based companies (or companies utilizing high tech), enables them to benefit from a specified university or technology institute or R&D center to develop their technology and/or software and to convert their technological findings into a commercial product, method or service. They contribute to the economic development of the area and are located inside or nearby the collaborating university, technology institute or R&D center, integrating academic, economic and social structures.\textsuperscript{43}

According to the Turkish Association of Technology Development Zones, there are 69 technoparks in Turkey, of which 55 are in operation as of December 2016. There are 4510 companies that are located in these technoparks. Of these, 37\% are in the software development sector and 17\% are in the communication sector. As of May 2016, a total of 46314 employees were employed in Technology Development Zones. The number of R&D projects completed in the Technology Development Regions to date is 23007 and the number of R&D projects carried out in 2017 was 8915. The number of patents registered by the companies operating in the TDZs is 640 and the number of patents in the application process is 1121.\textsuperscript{44}

The Ministry is evaluating the performances of the TDZs to determine their strengths and areas that are candidates for improvement. According to the Technology Development Zones Performance Index 2016, here are the top 10 TDZs:

\textsuperscript{41}https://www.tubitak.gov.tr/tr/destekler/akademik/ulusal-destek-programlari/icerik-1513-teknoji-transfer-ofisleri-destekleme-programi
\textsuperscript{42}http://ttaturkey.org/upload/GoodPractice.pdf
\textsuperscript{43}http://www.ariteknokent.com.tr/en/where/what-is-technopark
\textsuperscript{44}http://btgm.sanayi.gov.tr/
1. METU Technopolis TDZ
2. İTÜ Arı Technopolis TDZ
3. Ankara TDZ (Cyberpark)
4. Mersin TDZ
5. Erciyes University TDZ
6. İzmir TDZ
7. Yıldız Technical University TDZ
8. Istanbul TDZ
9. İstanbul University TDZ
10. Ankara University TDZ

2.3.4. Women Entrepreneurship

Women entrepreneurs play an important role in local economies. Having fewer women entrepreneurs in a country means that country does not unleash its full workforce and economic potential. This means less innovation and less job creation. The Turkish entrepreneurship ecosystem is growing rapidly and we have started to see global achievements in the past few years with examples such as the Yemeksepeti’s acquisition by DeliveryHero or Peak Game’s acquisition by Zynga. But when it comes to women in entrepreneurship, there is much room for improvement.

As of December 2016, 49.8% of the population is women. Among the population aged 15 years and over, the labor force participation rate was 71.6% for males and 31.5% for females as of January 2016.

Despite the huge potential, Turkey holds the 131th rank among 144 countries at the World Economic Forum’s The Global Gender Gap 2017 Index which was mentioned in the earlier sections.

According to Startups.watch, proportion of women entrepreneurs in the venture ecosystem in Turkey is around 15%. Moreover, between January – September 2017 only 15% of the venture investment in Turkey went to startups with at least one woman founder.

When we look at the most active VC firms in Turkey based on the StartupsWatch data (ACT VC, DCP VC, 500 Istanbul, TRPE, Growth Circuit, Earlybird, Revo, Zorlu Ventures) we see that just 3 of them (500 Istanbul, TRPE, Growth Circuit) have a female partner.

Efforts to close the gender gap are extremely important not just for the entrepreneurship ecosystem but also for sustainable economic development. Clearly, as the stakeholders of the ecosystem, we need to work on this very important issue all together by setting goals, defining policies and executing them. Recommendations on this issue will be stated in the next chapter.
3. Outputs and Achievements of the TTA Turkey Project

The overall objectives of the TTA Turkey Project is to contribute towards improving the R&D commercialization capabilities at TTOs and universities, and TÜBİTAK’s capacity on commercialization of R&D, as well as supporting both fund managers of TTA Turkey Funds (ACT VC and DCP VC) for their deal sourcing and assessment activities.

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Technology Transfer Accelerator Turkey, Advisory Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Number</td>
<td>TA2015001/EIF/TTA-TR</td>
</tr>
<tr>
<td>Contracting Authority</td>
<td>European Investment Fund (“EIF”)</td>
</tr>
<tr>
<td>Promoter</td>
<td>The Scientific and Technological Research Council of Turkey (“TÜBİTAK”)</td>
</tr>
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<td>Mandate</td>
<td>IPA Technology Transfer Accelerator Fund (“TTA Turkey”), based on Contract TR07R1.02-01/001 (“Contribution Agreement”), signed between EIF and the Ministry of Science, Industry and Technology (“MoSIT”) – DG for EU and Foreign Affairs – Regional Competitiveness Operational Programme (“RCP”) Coordination and Implementation Directorate</td>
</tr>
<tr>
<td>Target Groups</td>
<td>TTOs/Universities, TÜBİTAK and TTA Turkey Fund Managers</td>
</tr>
<tr>
<td>Beneficiary Country</td>
<td>Turkey, with a particular emphasis on spill-overs to the 12 NUTS III Regions</td>
</tr>
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Table 3: TTA Turkey Project Synopsis

Here are some highlights of the achievements of the Project:

**Strategy Planning for TTOs:** Selected TTOs were mentored by international experts for developing strategy plans after conducting needs assessment study through surveys and interviews through site visits.

**Hands-on (applied) Trainings for Academicians and TTOs:** 20 TTOs and 40 academicians were trained on Lean Startup Methodology, Customer Development, Business Model Validation and Growth Marketing through The Venture Pipeline Development Program. Moreover, 15 webinars were organized in 2 years on various topics from IP licensing to TTO Strategies. The overwhelming majority of the participants stated that the training program was very helpful, that they learned a lot and that they will teach what they learned to their colleagues and students.

**TTO Staff-Exchange Program:** The TTO Staff-Exchange Program was designed for 10 selected TTOs. These TTOs visited the TTOs in France and the U.S. to learn from each other. The participants from the TTOs stated that they benefited from the on-site visits and from working with their French and American counterparts to enhance their TTO strategy and execution.

**Business Development for TTA Turkey Funds (ACT VC and DCP VC):** The main focus of the business development activities is to facilitate identification of investment
ready opportunities for the TTA Turkey Funds, namely ACT and DCP. Business Development Leaders have worked with the TTOs, technoparks, accelerators, angel investor networks and other VC Firms in close collaboration with the TTA Turkey Fund managers to identify and evaluate investment ready opportunities. Here are some highlights:

- 66 Technopark & TTO visits (11 TTOs are visited by both Business Development Leaders)
- 944 face-to-face meetings
- 914 projects evaluated as being a jury member
- 165 startup projects mentoring
- 40 meetings with ACT & DCP in total
- 115 deals shared with ACT & DCP which of 12 got investments from ACT and DCP VC (DD is still going on for 6 projects).
- A Demo Day was organized for the 11 VC Firms with the selected projects out of 165 projects that they mentored.

Moreover, Business Development Leaders contributed to the portfolio companies of the TTA Turkey Funds and the Funds themselves through their networking efforts in Turkey as well as in the U.S., especially San Francisco.

Business Development Leaders also trained selected TTOs on Venture Investing 101 and Due Diligence Process. Moreover, since Business Development Leaders have interacted with the overwhelming majority of TTOs in Turkey, they have sustained partnership channels among TTOs as well as other stakeholders.

**Project Visibility and Publicity:** The Project website was created (www.ttaturkey.org) with general information about the program, as well industry news, events, and a resource library.

Project visibility activities are carried out through attending major conferences as speakers and arranging press meetings. Seminars by Business Development Leaders on the ‘TTA Turkey Project’ and ‘The Importance of TTOs on Technology Development’ at more than 50 universities were carried out. Moreover, The Project received much press coverage including coverage by Forbes UK, Dunya Newspaper, Hurriyet Newspaper and Webrazzi.

International Conferences were held in 2016 and 2017 for the Project. Each conference attracted more than 200 participants from the ecosystem as well as the participation from the Ministry, EIF and TUBITAK.
Publications:


- “Technology Transfer Book of Knowledge with Turkish TTO Good Practices” was published in November 2017: [http://www.ttaturkey.org/upload/GoodPractice.pdf](http://www.ttaturkey.org/upload/GoodPractice.pdf)

- “Entrepreneurship and Technology Commercialization Report 2017: Global Trends and Specific Look at Turkey” was published in January 2018 which can be also downloaded from the TTA Turkey website.
4. Observations and Recommendations

In this chapter, observations and recommendations gleaned from our 2 years with the TTA Turkey Project are stated with regard to the Turkish Entrepreneurship and Technology Transfer Ecosystem. Although some of these were stated in last year’s report as well, they are still relevant for 2017.

Technology Commercialization: Business Development Leaders and experts of the TTA Turkey Project made 66 TTO visits in 2016 and 2017. They had the chance to hold one on one meetings with academicians. Even though TTOs have different levels of experience, some broad conclusions emerged:

- A general issue we witnessed is that the technological parts of the projects are great whereas the business related parts are weak. Project owners are generally from an engineering or scientific background and usually don’t think about the business-related parts of the project. Moreover, some technical project owners told us that they don’t believe that the business aspects are important. Most academicians develop solutions and would like to commercialize their projects without searching for the needs or the problems of the industry. The tendency is to value the technology but to ignore the business. This mentality is one of the most significant obstacles we found, and it will threaten innovation over a sustained period if attitudes do not change.

- Most of the TTOs that we visited mentioned this issue as well and asked for recommendations. We recommend that TTOs pair MBA students with the academicians to work on projects. In this manner MBA students can work on some real projects and academicians don’t need to bother with the business aspects. If they both agree that they can work together and the project has potential for commercialization, they can become co-founders.

- Some academicians told us that since their most important performance metric is the number of papers that they publish, they focus on that and don’t think about the commercialization of their technology projects. Some indicators related with entrepreneurship and/or technology commercialization can be integrated into performance criteria of academicians to motivate academicians to put more emphasis on commercialization.

- Thanks to TÜBİTAK, there are many support programs for academicians to fund the basic research as well as applied research projects. Likewise, tech accelerator funds like TTA Turkey Funds - ACT VC and DCP VC are great opportunities for IP based tech projects. But it seems that there is also a need to set up a maturation financing mechanism which will allow first to improve the TRL level of the inventions to make them acceptable to industries, and second to develop all the commercialization and legal studies which are necessary to transform an
invention in a product or a process. This fund may be managed by TTOs and be used for the research projects that have great potential for commercialization. By bearing in mind that there are not many skilled TTO staff; some training programs for the personnel who will manage the fund as well as the performance evaluation criteria should be designed.

Specialized Acceleration Program which is to be applied by number of TTOs with a centralized monitoring system by TÜBİTAK may increase the success of technology commercialization efforts. The acceleration program should aim for business model validation through a high level of customer engagement. It would be more beneficial to organize thematic acceleration programs which increase the specialization of TTOs.

TTO Staff and Skill Sets: During the TTO visits, we had a chance to see the TTOs on site and meet the staff. Although the staff is working heartily, most of the TTOs don’t have fully skilled and experienced people who work on technology commercialization. Some TTOs told us they need templates to follow for technology commercialization but since there is no “one size fits all” approach on that matter; they need to tailor the current strategies to execute them. In order to do this, TTOs need to begin to develop broader skill sets and promote professional development opportunities. Most of the TTO staff as mentioned earlier are not experienced enough in technology transfer nor have industry experience either. It is needed to place more emphasis and effort on relationship building with the objective of building more capacity. To run the Modules, 3, 4 & 5 efficiently, they may need a high caliber steering committee from within the industry. This committee can support the university – industry relationship, effectively engage the regional ecosystem and provide insights about which research projects should be pulled into commercialization.

Endorsement of the University Management is Decisive: The TTOs are the main interface between the university and the outside world. Their role is crucial for relationship building among academia, industry and government, and for successful technology transfer and commercialization. Many of the university management are primarily focused on the revenue generation potential of technology transfer operations and less on the societal benefits or economic engagement. TTOs cannot operate effectively if the university management does not endorse, communicate their role and appreciate them.

Collaboration Among TTOs is Necessary: Since Business Development Leaders interacted with almost every TTOs in Turkey, they noticed that cooperation among TTOs should be fostered. One of the contributions of the TTA Project was sustaining partner channels among TTOs and catalyzing cooperation among the different TTOs. We also received feedback from TTO Managers that the training and events that were held under TTA Turkey Project were great chances for to meet counterparts and share experiences. There is a clear need for platforms and perhaps periodic events that enable TTO Teams to get together, learn from each other and embark on meaningful cooperation.
For reason of expertise the question to set up common services for TTOs might be considered. It is clear that some technical tools, software and services, like advanced market research or IP cartography are not accessible to a sole TTO and common services should be envisaged. Common services might enlarge having a common IP portfolio since IP portfolios of some individual TTOs are small and having a common portfolio would bring collaboration and allow faster scaling. A common IP portfolio would also increase open innovation systems.

**Corporations Should Contribute More to the Ecosystem:** Neither the acquisition of startups nor collaboration with startups and academicians is common among corporations in Turkey. Corporations should contribute more to the entrepreneurial ecosystem through partnerships with startups and academicians as well as through M&A activities. The efforts of corporations through sponsorship of events or organizing hackathons are appreciated but they should have structured programs and dedicated teams for collaboration with startups and academicians in order to create real value and meaningful results.

**Metrics Matter:** Performance of the incubation centers and accelerator programs should be measured and transparent. As stated before an incubator and an accelerator are different structures and therefore their metrics should be different. An incubator could be evaluated for the number of new businesses that start. The U.S. Small Business Administration states the performance metrics of an accelerator as belows\(^45\) (these type of metrics should be evaluated for Turkey):

<table>
<thead>
<tr>
<th>Time Horizon</th>
<th>Accelerator Metrics</th>
<th>Startup Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short-Term</strong> (program duration plus 6 months)</td>
<td>Number of applicants</td>
<td>Operational status (operating, closed, acquired)</td>
</tr>
<tr>
<td></td>
<td>Number of participants (cohort size)</td>
<td>Number of financial investments or number of investors</td>
</tr>
<tr>
<td></td>
<td>Number of investors at demo day</td>
<td>Size of financial investments</td>
</tr>
<tr>
<td></td>
<td>Percentage receiving next-stage funding</td>
<td>Number of customers gained</td>
</tr>
<tr>
<td></td>
<td>Percentage acquired</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage failed</td>
<td></td>
</tr>
<tr>
<td><strong>Long-Term</strong> (expected cash-out in 3–7 years)</td>
<td>Sources of funding (series or portfolio)</td>
<td>Sales or revenue</td>
</tr>
<tr>
<td></td>
<td>Performance distribution (cohort or portfolio)</td>
<td>Number of employees</td>
</tr>
<tr>
<td></td>
<td>Internal rate of return (cohort or portfolio)</td>
<td>Rate of return to investors</td>
</tr>
<tr>
<td></td>
<td>Network metrics (partnerships, etc.)</td>
<td>Stock prices (if applicable)</td>
</tr>
</tbody>
</table>

**Table 4: Performance Metrics of Accelerators**

**Importance of Angel Investors:** There are 428 accredited angel investors in Turkey as of November 2017. It is estimated that there are 150 active angel investors in Turkey who have invested in at least 1 startup. This means there are around 280 silent angel investors. Since the number of silent angel investors is high, finding the reasons that

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lie behind their inactivity is a worthy effort. An in-depth study, along with investment forums and trainings can be conducted to increase angel activity in Turkey.

**Women Entrepreneurship:** The participation of women in entrepreneurial ecosystems is a global issue. Coping with the obstacles that set back women is not just crucial for women but also for the sake of broader economic development within countries. In this regard, Turkey should take action to overcome the obstacles that prevent more women from becoming entrepreneurs. One of these actions could be to appreciate women entrepreneurs and outstanding female academics and to make them more visible. Young women need to see women role models who will inspire and motivate them to achieve more. In this regard, it is important for successful women as role models to help the young generation. As Magdalena Yesil who is a founder, an entrepreneur, and a venture capitalist to many of the world’s top technology companies including Salesforce states in her book “Power Up: How Smart Women Win in the New Economy”; “It is time that women who have been successful step up and explicitly, publicly support the next generation making their way in this tough field”.

Moreover, VC firms should employ more women. We believe that this will not only increase the women in venture investing but also the number of funded female entrepreneurs. This very important subject deserves more attention, effort and work to have a better understanding and to find better solutions.

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Appendix: Turkish Startup Ecosystem Map

This map is produced for information purposes. Startup.watch Turkish Startup Ecosystem Map is used as one of the main sources.