

EUROPE, MIDDLE-EAST, AND AFRICA

TURKEY





Innovate UK





UNDERSTANDING TURKEY'S INNOVATION SYSTEM

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1.
COUNTRY PROFILE

COUNTRY PROFILE

1.1

INTRODUCTION

- The Turkish Government launched the Scientific and Technological Research Council of Turkey (TUBITAK, Turkish acronym) in 1963; this was its first initiative related to science and technology policy, with a mission to foster science and technological activity.
- As a developing country, in accordance with the political climate of the time, Turkey implemented import-substitution policies until the year 1980 under the provision of five-year development plans.¹ The main focus of this era was to foster domestic production in the sectors with high gross debt in order to decrease the current account deficit of the country.
- After several economic crises and political turmoil during the 1970s, the economic policy of the country shifted to export-led development, with the step-by-step liberalisation of the markets throughout the 1980s. As expected, a focus on exports paved the way for more quality and competitiveness. Therefore, Turkish industry began to search for more quality with less cost, which triggered new initiatives for competitiveness led by quality and innovation. Throughout the 1990s, Turkish industrialists and policymakers were debating these concepts widely.
- On the policy side, Turkey has broad experience in innovation policymaking. The first science and technology policy was formed in the beginning of

the 1980s and launched in 1983, under the name of 'Turkish Science Policy: 1983-2003'.² This policy was directed at scientific research and innovation was not a great concern of this document since Turkish policymakers had linear innovation approach that is beginning in laboratory and finishing in the market. The Supreme Council on Science and Technology (BTYK, Turkish acronym) was established in 1989 with the participation of the highest levels of Government, including the President and Prime Minister. TUBITAK was responsible for the coordination of this Council. Unfortunately, despite the fact that it had planned to meet twice a year, this council was convened only three times in the decade after its establishment, since public and political awareness about innovation was so little at the time.

- Throughout this time, two important events happened. In 1991, the first ever R&D support institution, namely the Technology Development Foundation of Turkey (TTGV, Turkish acronym), was established with support from the World Bank. Then in 1995, TUBITAK launched the TIDEB programme – the first grant programme for industrial R&D activities. Despite the fact that their support was relatively low in the first decade after their establishment, both reflected a turning point for industrial R&D and innovation. Their aims, in general, were to foster the competitiveness of Turkish industry through innovation.

¹ Yulek, 2015.
² TUBITAK, 1993.

1.1 INTRODUCTION

- In 1996, full membership in the World Trade Organization (WTO) and accession to the Customs Union marked an important milestone in terms of innovation incentive systems for Turkey. The economic policies and reform programmes implemented after the financial crises of the 2000s also contributed to the creation of an appropriate environment for the implementation of innovation and regional policies. In addition, over the same period, with the launch of the pre-accession process of harmonisation with the EU (where countries must meet certain economic and regulatory criteria in order to trade with the EU), Turkey has come under a number of new obligations, including compliance with EU innovation and regional policies. As a result, while TUBITAK and TTGV support for R&D has become widespread, KOSGEB and newly established development agencies have become important players for incentivising R&D and innovation.

- **Vision 2023: Science and Technology Foresight Study**

In 2000, The Supreme Council for Science and Technology (BTYK, Turkish acronym) appointed TUBITAK to prepare new science and technology policies for the following two decades extending to 2023. It would be the most comprehensive study of all times in Turkish history in terms of science and technology policymaking and some of the scientific methods such as technological foresight and DELPHI were used.³

COUNTRY PROFILE

1.1

INTRODUCTION

As a result of this extensive work, the 'National Science and Technology Policy: 2003-2023 Strategy Paper', which was highly regarded by the public and private sectors, was published. This document outlined the strategic 'Technologies for Turkey', along with roadmaps for the next 20 years.⁴ Although the implementation of this strategy has been weak, it has triggered a greater awareness of technology and innovation throughout the public and private sectors.⁵ As a result, TIDEB turned into the TEYDEB programme and the R&D grants provided were extended. Furthermore, new parts of the national innovation ecosystem have been generated and become widespread. For example, development agencies were established and TEYDEB has designed and implemented many grant programmes, not only for industrial R&D but also to assist the generation of innovation ecosystem components such as technology-based entrepreneurship, incubators, accelerators, technology transfer offices and so on.

On the next column, we highlight two important documents which are capable of influencing Turkish R&D and the innovation ecosystem in the next decade.

- **11th Five-Year Development Plan of Turkey**
Turkey has gained vast planning experience since the establishment of the Republic. The country's last three development plans emphasise the importance of R&D and innovation; in particular, the latest plan, namely the 11th Five-Year Development Plan of Turkey, has given an important role to R&D, innovation, technology transfer, entrepreneurship, startups and digital transformation of the country.

<http://www.sbb.gov.tr/wp-content/uploads/2019/07/OnbirinciKalkinmaPlani.pdf>

- **Turkey's Industry 4.0 Transformation: Digital Turkey Road Map**

In 2018, the 'Digital Turkey Road Map' was published to capture the nation's fourth industrial revolution. As a developing country, this brand new era holds much potential for Turkey. The 11th Development Plan, which represents the highest-level planning of the Government, has given special emphasis to the concept of Digital Transformation and Industry 4.0, since most Turkish SMEs will need to transform themselves in order to gain global competitiveness.

<https://www.sanayi.gov.tr/tsddtyh.pdf>

⁴ TUBITAK, 2004.

⁵ AKKERMAN Z., 2006.

COUNTRY PROFILE

1.2
STATISTICAL
HIGHLIGHTS

Although the Turkish Government and policymakers have held innovation as one of the top policy agenda priorities for more than a decade, Turkey’s innovation system is still relatively weak in comparison with other EU countries of similar size and development level. However, it can be considered very successful compared to neighbouring countries.

According to the Global Innovation Index 2018, Turkey (50th) is in the upper-middle-income group with Croatia (41st), Thailand (44th), the Russian Federation (46th), and Romania (49th). In terms of technological level, high technology export figures constitute a very small portion of the total trade volume.

| | TURKEY | EGYPT | JORDAN | KENYA | SOUTH AFRICA |
|----------------------------------|--------|-------|--------|-------|--------------|
| Overall GII Score | 39.5 | 29.5 | 33.6 | 33.5 | 39.5 |
| Institution | 51.0 | 44.3 | 60.6 | 55.3 | 65.6 |
| Human Capital and Research | 35.8 | 23.0 | 31.0 | 14.6 | 30.5 |
| Infrastructure | 49.3 | 37.9 | 40.4 | 33.5 | 39.4 |
| Market Sophistication | 48.4 | 38.8 | 36.2 | 47.5 | 57.0 |
| Business Sophistication | 28.7 | 19.5 | 18.7 | 33.3 | 34.4 |
| Knowledge and Technology Outputs | 25.7 | 21.1 | 18.6 | 20.7 | 25.2 |
| Creative Outputs | 38.7 | 22.1 | 29.8 | 29.9 | 24.6 |
| Source: Cornell et al. 2018 | | | | | |

COUNTRY PROFILE

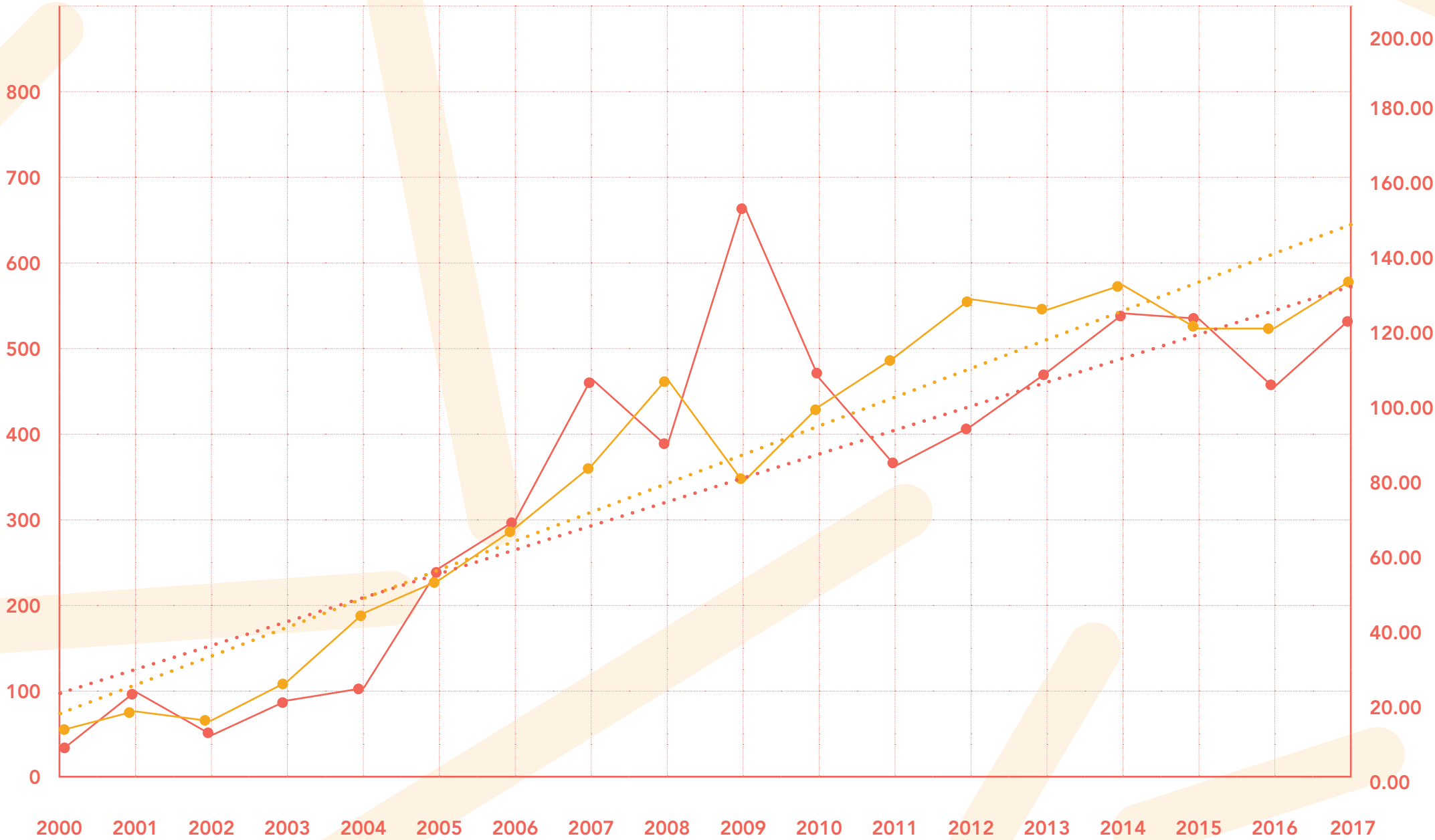
1.2
STATISTICAL
HIGHLIGHTS

In contrast, another important insight is the expansion in grants provided for industrial R&D, which have been quadrupled in the fifteen years between 2002 and 2017. This improvement can also be correlated with Turkish growing export numbers. Furthermore, the valuable indicators, namely the R&D expenditure in Gross Domestic Product and Full Time Equivalent

Personnel in 10,000 persons, have slowly but gradually increased in Turkey. Together, this suggests that the main indicators of the Turkish innovation system have been improving in the past decade.

https://www.tubitak.gov.tr/en/funds/industry/national-support-programmes#funds_industry_ana_sayfa_akordiyon-block_1-0

TUBITAK GRANTS AND EXPORT NUMBERS (2000-2017)

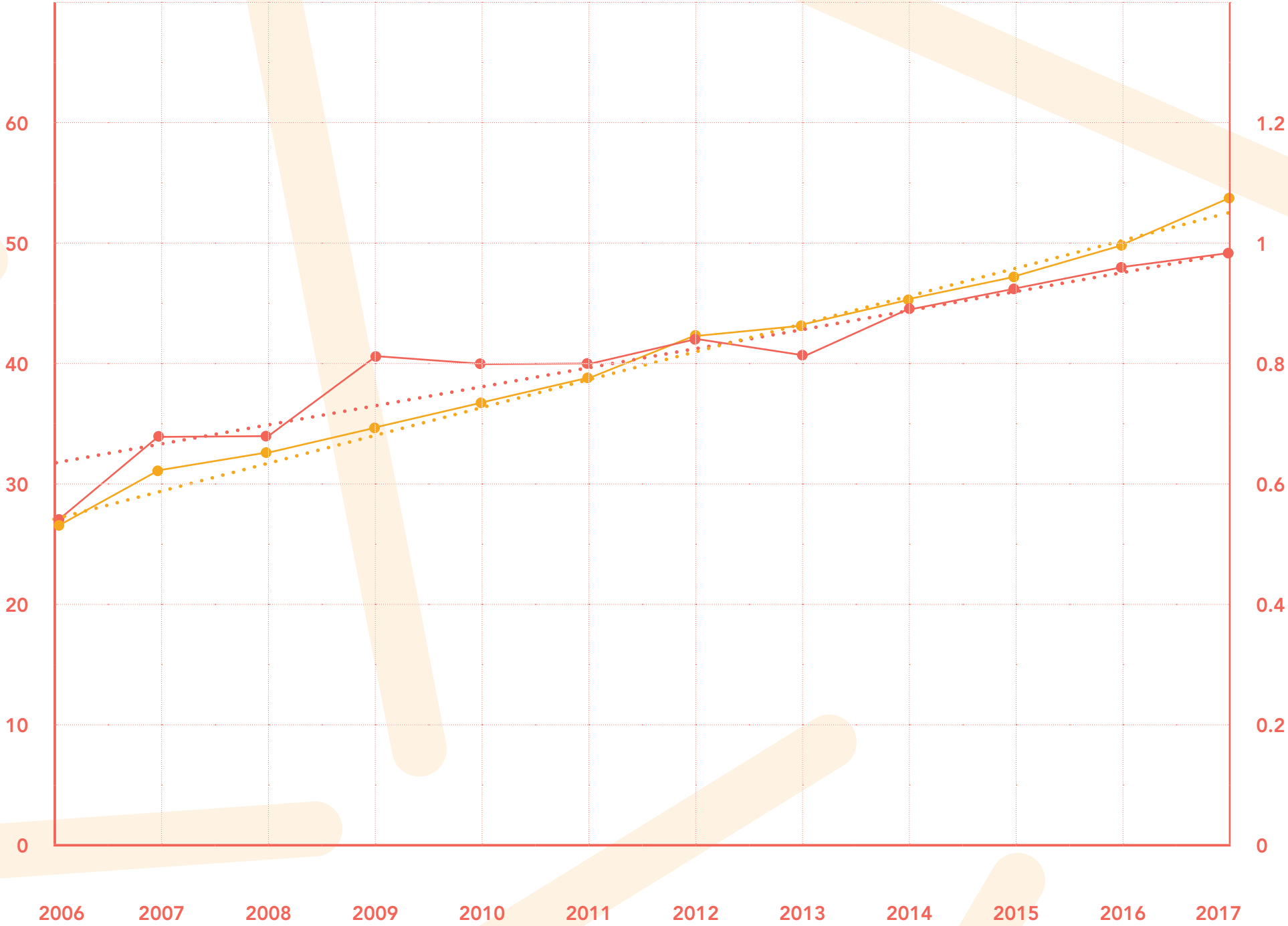


Source: Calculated from the stats available at: <https://www.tubitak.gov.tr/en/content-national-science-technology-and-innovation-statistics-of-turkey>

- TEYDEB Grant Supports (in million TRY, total)
- Export Numbers (in billion USD dollars)
- Trend Line (TEYDEB Grant Supports)
- Trend Line (Export Numbers)

1.2 STATISTICAL HIGHLIGHTS

R&D EXPENDITURE IN GDP AND FTE PERSONNEL (2006-2017)



Source: Calculated from the stats available at:
<https://www.tubitak.gov.tr/en/content-national-science-technology-and-innovation-statistics-of-turkey>

- FTE R&D Personnel (in 10 000 persons)
- R&D Expenditure in GDP
- Trend Line (FTE R&D Personnel)
- Trend Line (R&D Expenditure in GDP)

COUNTRY PROFILE

1.3
HIGHLIGHTS
OF KEY
INNOVATION
PROGRAMMES

TURKISH EXPORTERS ASSEMBLY (TIM)
PROGRAMMES

TIM, as the umbrella organisation of around 83,000 exporting companies, was established in 1993. It continues its studies on a legitimate basis as the professional organisation of the firms involved in foreign trade. TIM conducts mentoring programmes, such as Inosuit, for innovation-oriented entrepreneurs. It provides a source of funding to increase the export potential of Turkish companies and develop Turkey’s entrepreneurship ecosystem. TIM establishes **entrepreneurship centres in different locations in collaboration with Turkish Economy Bank**, and conducts acceleration programmes in these centres. www.tim.org.tr

THE SCIENTIFIC AND TECHNOLOGICAL
RESEARCH COUNCIL OF TURKEY (TUBITAK)
PROGRAMMES

TUBITAK is the leading agency for management, funding and conducting research in Turkey. It was established in 1963 with a mission to advance science and technology, conduct research and support Turkish researchers. TUBITAK is responsible for promoting, developing, organising, carrying out and coordinating research and development in line with national targets and priorities. TUBITAK acts as an advisory agency to the Turkish Government on science and research issues, and is the secretariat of the Supreme Council for Science and Technology (SCST), the highest

science and technology (S&T) policymaking body in Turkey. TUBITAK not only supports innovation, academic and industrial R&D studies but also, in line with national priorities, develops scientific and technological policies and manages R&D institutes, carrying out research, technology and development studies. Furthermore, it funds research projects carried out in universities and other public and private organisations; conducts research on strategic areas; develops support programmes for the public and private sectors; publishes scientific journals, popular science magazines and books; organises science and society activities; and supports undergraduate and graduate students through scholarships. Particularly, since 2005, TEYDEB has diversified its support programmes including not only industrial R&D but also entrepreneurship, technology transfer, SME development, venture capital formation and more. www.tubitak.gov.tr

SMALL AND MEDIUM ENTERPRISES
DEVELOPMENT ORGANIZATION OF
TURKEY (KOSGEB) PROGRAMMES

KOSGEB, which was established in 1990, provided services and support for SMEs in the manufacturing sector until 2009. However, due to the rising interest of the Government in the high added value technology-based sectors, it expanded its target population to cover all SMEs, including those in the service sector. The organisation supports SMEs with

COUNTRY PROFILE

1.3
HIGHLIGHTS
OF KEY
INNOVATION
PROGRAMMES

grant programmes for R&D, production and globalisation activities. KOSGEB is the coordinator of the **national entrepreneurship training certificate program**.

www.kosgeb.gov.tr

TURKISH PATENT AND TRADEMARK
OFFICE (TURKISH PATENT) PROGRAMMES

TURKISH PATENT was established in 1994. It has administrative and financial autonomy. It is responsible for: contributing to the development of the Turkish economy and technology by encouraging creativity and innovation; providing effective protection of patents, trademarks, industrial designs and other industrial property rights; disseminating the awareness and knowledge of industrial property rights throughout the country and cooperating with the related sectors; representing Turkey on international platforms, and strengthening cooperation for the protection of the interests and development of the Turkish economy. It coordinates national innovation programmes **such as the Hezarfen Innovation programme**.

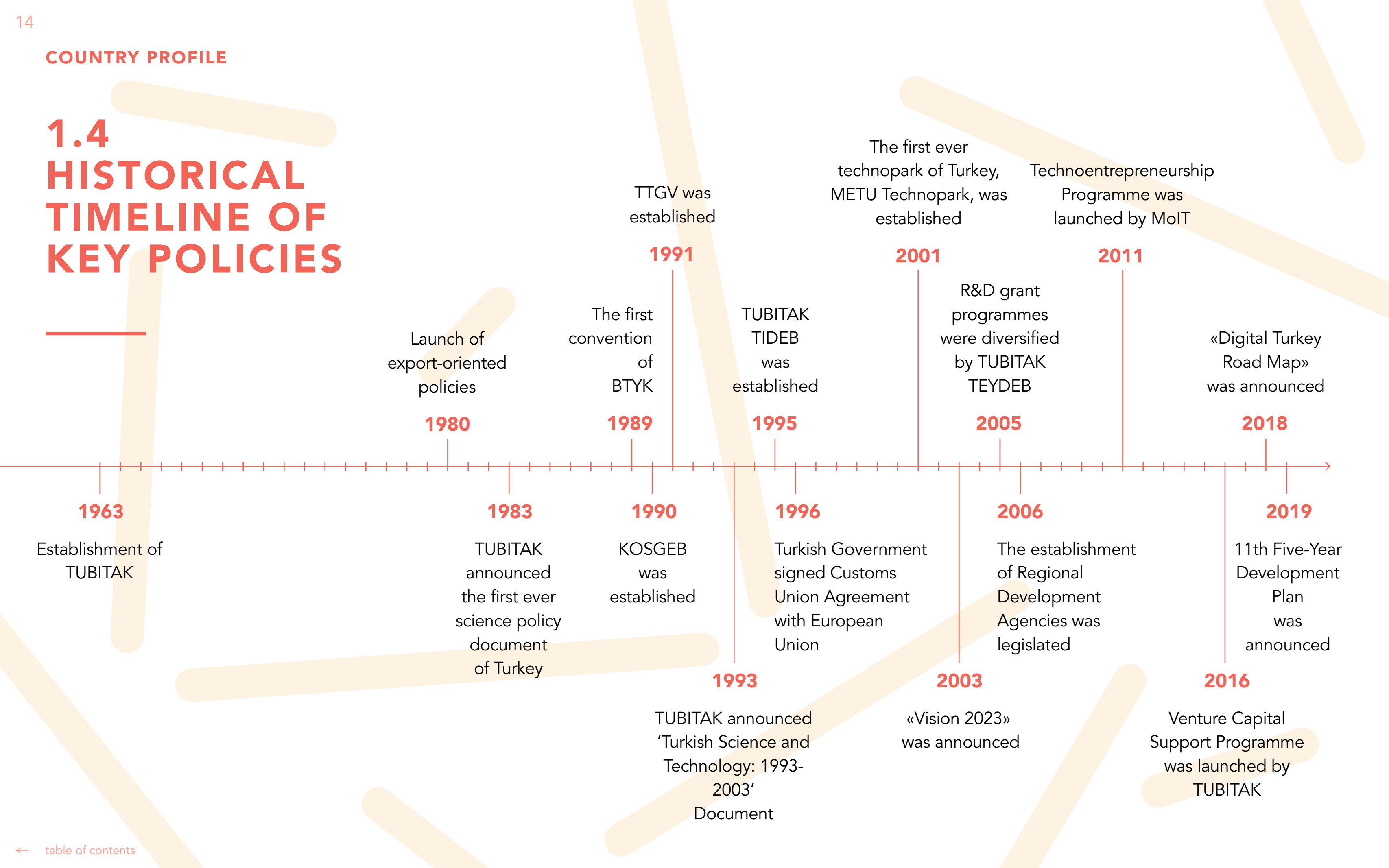
www.turkpatent.gov.tr

TECHNOLOGY DEVELOPMENT
FOUNDATION OF TURKEY (TTGV)
PROGRAMMES

TTGV was founded as a public-private partnership in 1991 with a mission to promote and support technology development and innovation activities by private companies. TTGV is Turkey's only **'non-profit intermediary/implementing agency - not primarily prioritising profit'** model that is commonly accepted in the world's developed ecosystems primarily in the European Union. TTGV is one of the seven non-profit organisations established by law and dedicated to technology and innovation in Turkey. TTGV designs, develops and implements activities to provide reference and build capacity for value-added operations, processes and products to support the vision of 'Technology Developing Turkey'. It coordinates national innovation programmes **such as Ideanest, Ideaport, Xnovate and Green Technology Support Programme**.

www.ttgvt.org.tr

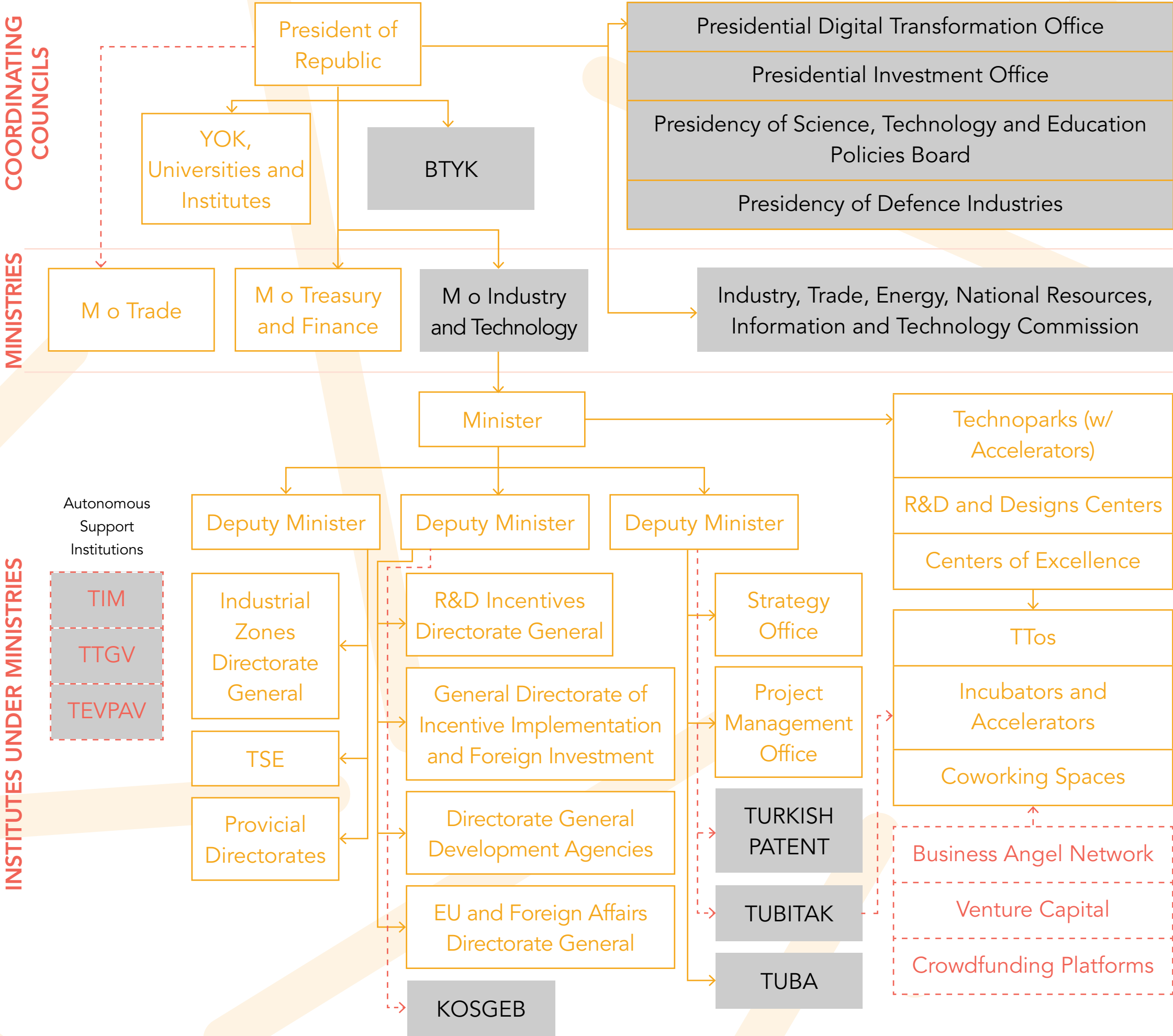
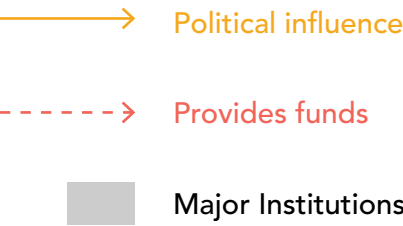
1.4 HISTORICAL TIMELINE OF KEY POLICIES



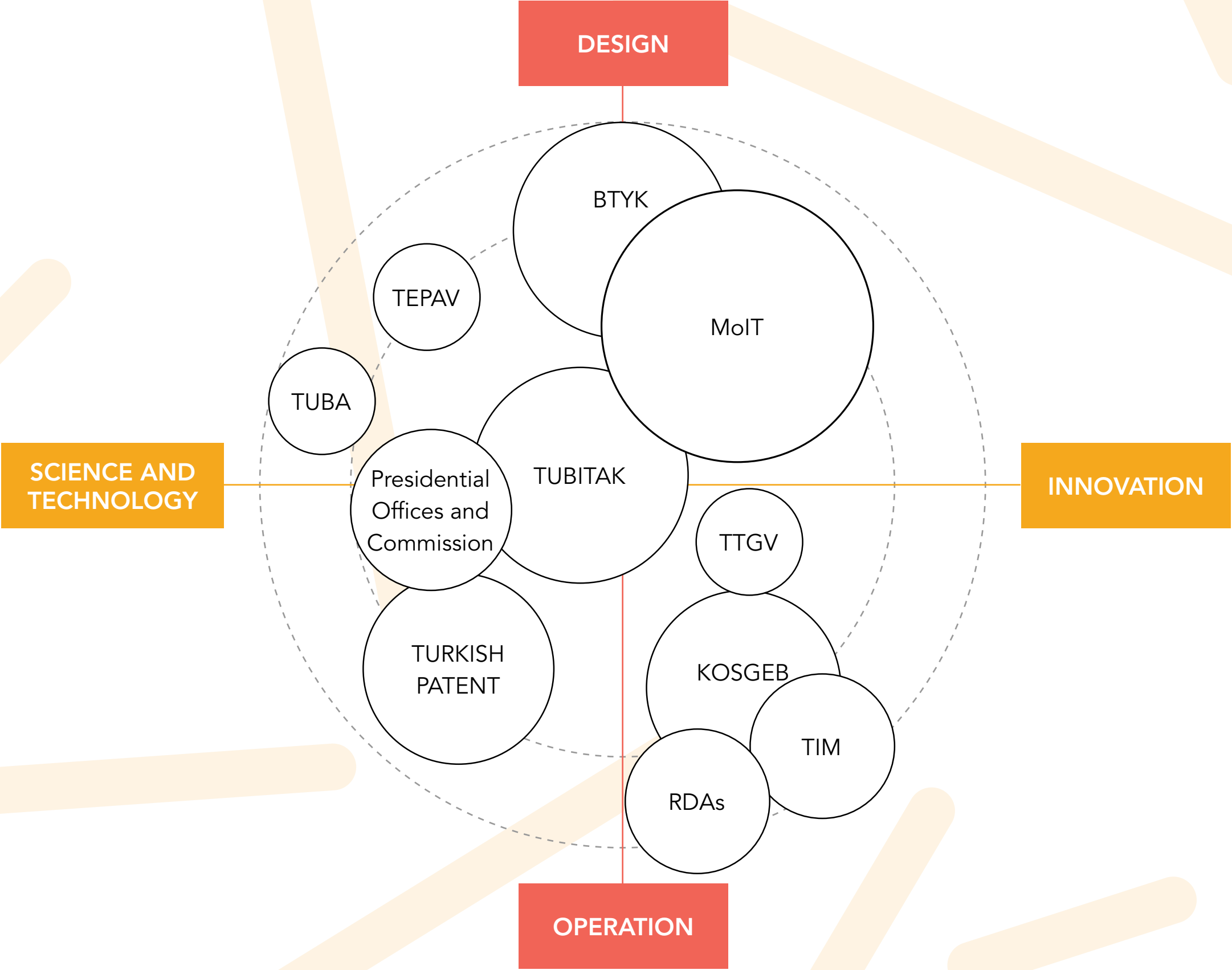
COUNTRY PROFILE

1.5.1
INSTITUTIONAL
MAP
OF THE
INNOVATION
SYSTEM

- This institutional map represents the existing institutional structure of the national system of science, technology and innovation policy in Turkey.
- The autonomous bodies represented directly or indirectly support entrepreneurs and private industrial enterprises so they are not connected to governmental institutions by means of political influence.



1.5.2 ROLE AND INFLUENCE DIAGRAM OF KEY MINISTRIES AND AGENCIES



Level of influence: the bigger the size of the bubble, the more influence in the innovation system.

This influence map is indicative and reflects the insights of the project team rather than a formal statement of roles and structures.

1.5.2 ROLE AND INFLUENCE DIAGRAM OF KEY MINISTRIES AND AGENCIES

- The role and influence of institutions in the Turkish innovation system is mainly determined by BTYK, which is led by the President. BTYK is the main body responsible for designing innovation policies with the assistance and coordination services provided by TUBITAK. On the educational side, which is one of the main components of innovation ecosystems, the universities are tied to the rules and regulations of the Council of Higher Education (YOK).
- On the ministries level, the Ministry of Industry and Technology (MoIT) works on policy design and the operational sides of the innovation ecosystem with its connected institutions; TUBITAK, KOSGEB, Turkish Patent and so on. In addition to its industrial R&D support, TUBITAK provides grants to innovation ecosystem agents such as techno parks, TTOs and incubators, as well as industrial firms.
- Autonomous institutions such as TTGV, TIM, and TEPAV sustain projects and provide funds, particularly to technology-based entrepreneurs and industrial enterprises, as well as operating as a think-tank by producing publications on soft innovation policy design.

1.6 GLOSSARY OF INSTITUTIONAL ABBREVIATIONS AND ACRONYMS

- **BTYK:** The Supreme Council for Science and Technology
- **KOSGEB:** Small and Medium Enterprises Development Organization of Turkey
- **MoIT:** Ministry of Industry and Technology
- **MOT:** Ministry of Trade
- **MOTF:** Ministry of Treasury and Finance
- **RDAs:** Regional Development Agencies
- **TEPAV:** The Economic Policy Research Foundation of Turkey
- **TIM:** Turkish Exporters Assembly
- **TTGV:** Technology Development Foundation of Turkey
- **TSE:** Turkish Standards Institution
- **TUBA:** Turkish Academy of Sciences
- **TUBITAK:** The Scientific and Technological Research Council of Turkey
- **TURKISH PATENT:** Turkish Patent and Trademark Office
- **YOK:** Council of Higher Education

1.7 STRENGTHS AND WEAKNESSES ANALYSIS



| INSTITUTIONAL FRAMEWORK | STRENGTHS | WEAKNESSES |
|-------------------------|---|--|
| | <p>Turkey has R&D-oriented policies and Development Plans. The relevant institutions are operating in accordance with these strategies.</p> <ul style="list-style-type: none">• Different political and operational bodies affiliated to the presidency and various ministries organise and develop R&D policies.• The Turkish R&D and innovation system is centralised and led by the Supreme Council for Science and Technology (BTYK), the legally formalised body chaired by the President.• All institutions are interrelated through different mechanisms. The Ministry of Industry and Technology is responsible for the coordination of science, technology and innovation (ST&I) policies.• There are also 26 Regional Development Agencies (RDAs) which are affiliated to the Ministry of Industry and Technology to encourage R&D and innovation on a regional scale.⁶ | <p>The coordination between governmental institutions is lower than expected, which means that sometimes they may be duplicating their efforts.</p> <ul style="list-style-type: none">• The coordination of Turkish governmental bodies is sometimes inefficient. For example, in the past there were concurrent support programmes for innovation that were overlapping each other.• In addition, sometimes governmental policies and programmes are not able to distribute responsibilities effectively as seen in the case of Vision 2023. Since there was no governmental institution responsible for the proper monitoring of technological roadmaps, the study was not as effective as expected, particularly on forecasted technological developments. |

1.6 STRENGTHS AND WEAKNESSES ANALYSIS

7 <https://teknopark.sanayi.gov.tr/>
8 www.tuik.org.tr; Konak 2018.
9 Akçomak and Bürken, 2019.

| | STRENGTHS | WEAKNESSES |
|---------|---|--|
| FUNDING | <p>There are many different grants and incentive programmes according to each stage of the innovation process in Turkey.</p> <ul style="list-style-type: none">• TUBITAK, KOSGEB, and MoIT are designing and implementing many different support programmes.• Those support programmes helped to increase R&D expenditure in GDP and private sector awareness on innovation. In addition, those programmes have helped to address and overcome some of the missing components of the innovation ecosystem.• The number of technology transfer offices (TTOs) has dramatically increased in the past seven years with the help of TUBITAK grants. There are more than 100 TTOs and half of them have been supported by TUBITAK. TUBITAK also encourages technology-based entrepreneurship programmes and venture capital fundraising in order to help new startups flourish. Also, incentives for innovation help techno parks and industrial R&D centres to attract private sector members.⁷ | <p>The return on public funds allocated to innovation is very low.</p> <ul style="list-style-type: none">• Turkey’s high-tech products exports level is very low. The share of total exports of Turkey in high-tech products is 3-4 per cent and lower than all other OECD countries.⁸ This is one of the reasons for Turkey’s ongoing current account deficit for decades. The main reason for this bottleneck is the challenge of turning research results into innovative products. The incentives programmes have failed to realise this transformation.• The support programmes and incentives focus on quantity rather than quality.⁹ Monitoring activities, impact assessments and evaluation of the programmes are relatively weak. |

1.6 STRENGTHS AND WEAKNESSES ANALYSIS

10 <https://agtm.sanayi.gov.tr/Home/Index>
11 <https://teknopark.sanayi.gov.tr/>
12 www.turkpatent.gov.tr
13 World Bank, 2019.

| BROADER ENVIRONMENT | STRENGTHS | WEAKNESSES |
|---------------------|---|--|
| | <p>Statistics on both innovation and entrepreneurship show an increasing trend.</p> <ul style="list-style-type: none">• The Turkish Government encourages research and development activities in the private sector. For example, The President put forward an objective to reach 1,000 R&D centres in 2018. As a result, Turkey has 962 R&D centres, employing more than 49,000 R&D personnel involved in more than 65,000 projects, according to the MoIT data.¹⁰ R&D centres that work to develop technology with staff of 15 or more are supported by the Government with tax exemptions and incentives. The country also has around 344 design centres that try to develop, improve, and diversify private sector products to boost the country’s international competitive edge. Furthermore, Turkey has 84 (63 active, 21 passive) techno parks and there are 5,328 firms within them. They employ 54,030 R&D personnel in more than 10,000 ongoing projects.¹¹• According to TURKISH PATENT statistics, 18,504 (7,349 national, 11,155 international) patent applications were filed in 2018. A total of 13,882 of these applications were registered. In addition, 105,996 brand registrations (a 24 per cent increase compared to the previous year) and 40,451 design registrations (a 9 per cent decrease compared to the previous year) were made in 2018.¹²• According to the World Bank Doing Business Index, (which compares business regulation in 190 economies) Turkey is ranked 33rd. This can be attributed to the developments in R&D and the innovation ecosystem.¹³ | <p>The government administrative system has been changed (Turkey shifted to a Presidential System in 2018) and the adaptation process for the new administrative style of the institutions has not yet been completed.</p> <ul style="list-style-type: none">• The Turkish national innovation system is highly dependent on government intervention. Since the restructuring process of the new administrative system is still continuing, possible ambiguities in administration is slowing down the effective support mechanisms on R&D and innovation. |

1.6 STRENGTHS AND WEAKNESSES ANALYSIS

15 http://www.tubitak.gov.tr/sites/default/files/289/gyue_ilk50.pdf

| | STRENGTHS | WEAKNESSES |
|-----------------------|---|--|
| ECOSYSTEM CONNECTIONS | <p>A comprehensive innovation ecosystem has been established within national boundaries.</p> <ul style="list-style-type: none">• The components of the national innovation ecosystem seem to be completed in Turkey. Strong governmental institutions have been accompanied by universities, industry and interface units such as technology transfer offices. | <p>Collaboration among agents and international technology transfer capability is very low. The effectiveness of the innovation ecosystem is not as strong as it could be.</p> <ul style="list-style-type: none">• The effectiveness of the innovation ecosystem in Turkey is in question. For example, technology transfer offices (TTOs) have been spread all around the country; however, when it comes to licensing, the numbers are nearly non-existent as depicted in the Entrepreneurial and Innovative University Rankings provided by MoIT and TUBITAK. Under its licensing criteria (as numbered 4.4), the index depicts that the points are too low for licensing even for the most successful universities, and have an estimated volume of 1 million Turkish Lira at most.¹⁵ It suggests that TTOs are not fulfilling their core mission as an university-industry interface. |

2.
**CAPACITY BUILDING FOR INNOVATION
IN TURKEY**

2.1 MAPPING INNOVATION POLICYMAKERS: ASSESSING THE SIZE OF THE CORE AUDIENCE

In the table below, we estimate the number of policymakers employed in key institutions in innovation policy roles at each of four key levels of seniority. The numbers below are drawn from publicly-available data on government employment, combined with insights from expert interviews.

| CORE INNOVATION POLICYMAKERS PER LEVEL OF SENIORITY | | | | | |
|--|----|----|----|-----|------------------------------------|
| Country | L1 | L2 | L3 | L4 | Total Core Innovation Policymakers |
| Turkey | 18 | 65 | 81 | 243 | 470* |
| * Numbers are estimated according to TUBITAK and MoIT current organisational chart since there is no concrete government data on this issue. | | | | | |

- Note:**
- L1** Represents the number of cabinet members
 - L2** Represents the number of executive board members
 - L3** Represents the number of director generals of key institutions
 - L4** Represents the number of deputy director generals and directors of key institutions

2.2 INNOVATION POLICYMAKER 'PERSONAS'



Associative Professor and Director of the Unit

He has been working as a university professor for eight years. Prior to this, he was a researcher at X University. His main responsibilities include directing policy research and formulation with regard to science, technology and innovation in the unit. He has undertaken a lot of research about Turkish science and technology policy. BSc. in Economics at a reputable Turkish university, and MSc and Ph.D. in Science and Technology Policy Development at a reputable European university.

“There are too many duplicating support programmes in the innovation ecosystem of Turkey.”

“The collaboration between innovation ecosystem actors is quite low. Beyond [the] university-industry relationship, university-university and industry-industry relationships and collaboration initiatives are rather weak as well.”

“The necessity of networking in innovation is a missing point in Turkey. Agents are not focusing on networking. They are generally more isolated from each other.”

“The innovation ecosystem has become concentrated on grants rather than performing innovation. I do not think this is good for capability development for innovation throughout the ecosystem.”

KEY INDIVIDUAL AND COLLECTIVE CHALLENGES

- Networking is a crucial element in innovation when collaboration is weak.
- The collaborative environment in Turkey is not suitable for innovation. Collaboration between different or similar agents in the ecosystem is not sufficient due to lack of trust-based relationships and collaborative culture.
- The budget allocated to universities is becoming decreased and as a result, the difference between Turkish top universities and European universities is increasing.

ASPIRATIONS AND EXPECTATION FROM INTERNATIONAL TRAINING PROGRAMMES

- International programmes should focus on and foster collaborative efforts among the agents of the Turkish innovation ecosystem.
- Collaborative research and development should be enforced by the government rather than solely supporting R&D projects by providing grant money.

2.2 INNOVATION POLICYMAKER 'PERSONAS'



General Manager at Y Technopark

He has been working in the innovation ecosystem for about a decade. He provided high-level consultancy to high level individuals in Turkey and now, he is responsible for managing a flourishing tehnopark in Turkey.

BSc. in Industrial Engineering at METU.

“The institutions in [the] Turkish innovation ecosystem [are] not agile since they have been established with law and obligated to what is written in their establishment proposal.”

“The agents in [the] Turkish innovation ecosystem [are] concentrated on research and development activities rather than innovation.”

“There are so many entrepreneurs in Turkey that are capable of performing successful R&D. But when it comes to commercialisation, they are not able to do anything.”

“All the parties related to [the] innovation ecosystem in Turkey should make a concrete and consolidated definition and understanding of innovation.”

KEY INDIVIDUAL AND COLLECTIVE CHALLENGES

- The innovation system and its institutions are not agile in Turkey and this is the opposite of what the innovative activities require.
- The commercialisation process of research and development activities is the weakest link in the system. Policymakers should focus on innovation rather than research and development.

ASPIRATIONS AND EXPECTATION FROM INTERNATIONAL TRAINING PROGRAMMES

- Organising commercialisation-oriented innovation programmes.
- Focusing on innovation-oriented policy design.
- Organising trainings that include agile innovation and agile institutions in the innovation ecosystem.
- Establishing case study workshops that have concrete outcomes.

2.2 INNOVATION POLICYMAKER 'PERSONAS'



Manager at Technology Transfer Office of Z University

He worked for a non-profit organisation in the Turkish innovation ecosystem. He then became a university professor and taught innovation. He is now a TTO manager at Z University.

BSc. in Chemical Engineering and Msc and Ph.D. in Business Management at reputable Turkish universities.

"The main problem of [the] Turkish innovation ecosystem is its entrepreneurial part. Governmental institutions are concentrating on R&D rather than entrepreneurship."

"The new patent law legislated in 2017 is supporting the concept of innovation to a great extent. However, it has not been sufficiently introduced to [the] public."

"The system is not supporting innovation that is not containing R&D."

"The coordination among governmental bodies that are responsible for innovation policymaking is not sufficient."

KEY INDIVIDUAL AND COLLECTIVE CHALLENGES

- The coordination problem around key policymaking institutions should be eliminated.
- A more innovation-oriented policy approach should be established.
- One-size-fits-all support programmes should be turned into more selective and individualised ones.

ASPIRATIONS AND EXPECTATION FROM INTERNATIONAL TRAINING PROGRAMMES

- Establishing training programmes focused on global innovation rather than R&D.
- Organising workshops for case studies concerning the country examples similar to Turkey rather than the examples related to best practice.
- Organising mentorship trainings that are capable of developing high level mentors.
- Introducing trainings about design thinking.

3.
**ASSESSMENTS OF CURRENT AVAILABLE
RANGE OF SUPPORT AND TRAINING FOR INNOVATION
POLICYMAKERS IN TURKEY**

ASSESSMENTS OF CURRENT AVAILABLE RANGE OF SUPPORT AND TRAINING FOR INNOVATION POLICYMAKERS IN TURKEY

| PROGRAMME | ASSESSMENT |
|---|---|
| Registered Technology Transfer Professional (RTTP) Trainings by USIMP (University-Industry Collaboration Centres Platform) | <p>This training programme is the only accredited training programme in Turkey concerning technology transfer professionals and policymakers. In the context of the programme, participants are trained in terms of patent law, technology transfer, technology commercialisation and related topics. Launched in 2018, the programme has quickly gained a considerable reputation in the Turkish innovation ecosystem.</p> <p>www.usimp.org.tr</p> |
| Turkey in Horizon 2020 Project (by the Consortium of International Development Ireland and its partners) | <p>The Turkey in Horizon 2020 Project is being supported by the European Commission and TUBITAK and MoIT are the project owners. The project includes trainings, workshops and other activities designed to help develop the capabilities of Turkish innovation policymakers. The themes of these workshops and trainings include networking, proposal writing and policy design.</p> <p>http://turkeyinh2020.eu/</p> |

4.

**ASSESSMENT OF LIKELY AREAS OF FOCUS
FOR A GLOBAL INNOVATION POLICY ACCELERATOR TEAM
FROM TURKEY**

1.
Policy design
towards innovation rather
than R&D

Turkey’s GIPA team has recognised that Turkish ongoing support programmes are focusing on research and development activities rather than R&D. Hence, an innovation-oriented policy environment is required by ecosystem players. Innovation (and commercialisation) should be the focal point rather than R&D itself. Turkish policymakers should be aware of this. Also, policymakers could benefit from capability-building activities such as workshops and trainings that support this shift in awareness and change of focus. Technology-based innovation is vital for the ecosystem however at first sight, the concept of innovation (with or without technology) should be introduced more deeply to the agents of the ecosystem.

2.
Programme monitoring,
evaluation studies
and impact analysis

Another clear point that is missing in the Turkish innovation ecosystem is the lack of monitoring, evaluating and analysing the impact of programmes that are supporting R&D and innovation. There are many governmental programmes by TUBITAK, KOSGEB and MoIT aiming to foster technology-based entrepreneurship and innovation; however, they are not being evaluated and their social and economic impact are not being measured. These kinds of studies should be performed and transparently announced in the public sphere in order to make concrete evaluations about the innovation ecosystem.

3.
Fostering networking,
collaboration
and coordination

Innovation requires trust-based relationships among the agents in a national innovation ecosystem. With this in mind, the Turkish GIPA team has recognised that networking and collaboration among the parties in Turkey is quite limited. In addition, coordination among policymakers is weaker than expected. Beyond university-industry and government collaboration (as expected in the ‘triple helix model’ of innovation), similar organisations (e.g. business-to-business and university-to-university) are not able to talk with each other effectively. This is an important barrier to overcome to boost the effectiveness of the Turkish innovation ecosystem.

4.
Industry 4.0
and digital
transformation

As determined in the country’s 11th Five-Year Development Plan, digital transformation and the concepts of Industry 4.0 will play a crucial role in transforming Turkey into a more innovative and developed nation. With its economy based on SMEs, Turkey should effectively perform this transformation in order to maintain its position and competitiveness in global value chains. These concepts should be well-understood in the policy environment and convenient measures should be developed in the public sphere.

5.
**DIAGNOSIS AND
RECOMMENDATIONS**

DIAGNOSIS AND RECOMMENDATIONS

1. Shift of focus on innovation and commercialisation

Turkey has focused on technology development with its programmes until now. From now on, this focus should be shifted to innovation and commercialisation. There has always been a challenge in Turkey to turn research results into economic and social benefits. Policy designs should take this into account and take suitable measures to overcome this. As convenient to new innovation models, research and development activities should be carried out with a clear understanding of the potential customer and user opinions at every stage of development, from ideation to market launch.

2. Eliminating duplications and creating a more coordinated ecosystem

The duplications, both in institutions and their support programmes, in the Turkish innovation ecosystem should be addressed and resolved by policymakers. The coordination among governmental institutions should be increased while other agents in the system should have clear responsibilities that do not overlap each other. Furthermore, the institutions in the ecosystem should generate trust-based relationships by communicating more efficiently with each other.

3. Increasing high-technology exports

Despite the recent performance of the Turkish innovation ecosystem, the chronic problem of the Turkish economy based on low and medium technology exports is still ongoing. The share of high-technology exports is fluctuating around 3-4 per cent annually. The country seems to be caught in the 'middle-technology trap'. To address this and increase high-tech exports, policymakers should focus on groundbreaking technological developments and radical innovations without neglecting incremental innovations as well.

6.
BIBLIOGRAPHY

Akçomak, S., and Burken, S., (2019). The Middle Technology Trap: The Case of Automotive Industry in Turkey, UNU MERIT Working Paper Series, 2019-006.
Available at: <https://www.merit.unu.edu/publications/working-papers/abstract/?id=8084>

Akkerman, Z., (2006). Vizyon 2023: Technology Foresight For Turkey, Master's Thesis, METU, Ankara.

Cornell et al., (2018). Global Innovation Index, WIPO, 2018.
Available at: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2018.pdf

EBRD, (2019). Turkey Country Strategy 2019-2024 (Draft), EBRD.

Konak A., (2018). The Effect Of Product Export Of High Technology On Export Volume And Economic Growth; Selected OECD Countries and The Case Of Turkey, JOMELIPS - Journal of Management Economics Literature Islamic and Political Sciences, 3(2); 56-80.
DOI: 10.24013/jomelips.489768

Kelly R., and Sökmen A., (2019). Turkey Diagnostic, EBRD.
Available at: <https://www.ebrd.com/publications/country-diagnostics>

MoIT, (2018). Digital Turkey Road Map, Ministry of Science, Industry and Technology, Ankara.
Available at: <https://www.sanayi.gov.tr/tsddtyh.pdf>

OC&C, (2018). Türkiye'nin Teknoloji Girişimciliği Ekosistemi, Google.

SBB, (2019). The 11th Five-Year Development Plan of Turkey, Presidency of Turkish Republic Strategy and Budget Office, Ankara.
Available at: <http://www.sbb.gov.tr/wp-content/uploads/2019/07/OnbirinciKalkinmaPlani.pdf>

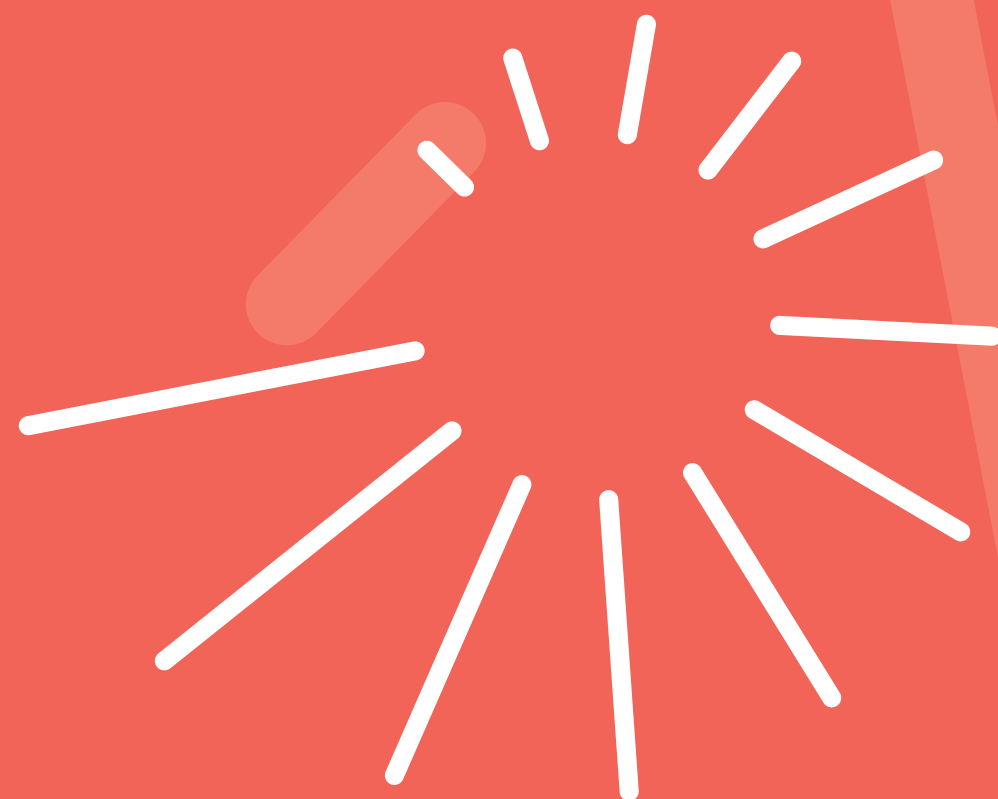
TUBITAK and MoIT, (2019). Girişimci ve Yenilikçi Üniversite Endeksi 2018, Ankara.
Available at: http://www.tubitak.gov.tr/sites/default/files/289/gyue_ilk50.pdf

TUBITAK, (1993). Türk Bilim ve Teknoloji Politikası: 1993-2003, TÜBİTAK, Ankara.

TUBITAK, (2004). Ulusal Bilim ve Teknoloji Politikaları: 2003-2023 Strateji Belgesi, Versiyon 19, TUBİTAK, Ankara.

World Bank, (2019). Doing Business 2020, World Bank, Washington DC.
Available at: <https://openknowledge.worldbank.org/bitstream/handle/10986/32436/9781464814402.pdf>

Yulek, M., (2015). Economic Planning and Industrial Policy in the Globalizing Economy, Springer, Switzerland.



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