Tech entrepreneurship ecosystem in Turkey

2018

OC&C
Strategy consultants

Commissioned by Google

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More than 30 years of unpicking the most complex business challenges with simple, uncommon sense.

We're an international consulting firm, but we've never seen size as an end in itself. Our expertise is focused on a few core specialisms, allowing us to deliver results that get noticed.

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To us, each client challenge is unique, so boilerplate solutions don't cut it. We interrogate a problem until we find its root. Then we develop a powerful way to solve it. We don't duck the difficult answers, we give clients the strategies they need.

Preface

The digital era has brought a fundamental shift in the global economy, pushing the limits of innovation and redefining the boundaries of global trade. Innovations have never been faster paced, more widespread, or scaled up more quickly, creating billion-dollar "unicorns". Over the last 15 years, the ICT sector – as a backdrop to innovation and digital advances – has seen its share grow from just 1.3 percent of the global economy to 3 percent, and it's set to grow even more.[1]

Nations that nurture a digital- and innovation-based culture have pioneered the global shift toward knowledge-based industries and have enjoyed extraordinary wealth (and job creation), while transforming the way people live and do business. This shift is made possible by substantial tech entrepreneurship activity within a supportive environment that includes both government and private-sector contributions. Initiatives by leading countries are now regarded as best practices for aspiring nations that want to create a similar impact, and the global conversation around regulation and innovation policies is framed around such practices.

Countries that are more reliant on manufacturing or natural resources are eager to capture a bigger share of the expanding digital economy. In order to deliver on these aspirations, they are exploring ways to transform the fundamentals of their economic structures and to deploy more resources to cultivate competitive tech entrepreneurship ecosystems. Establishing high-impact tech entrepreneurship as a sustainable source of employment is especially critical for nations with young populations and a need for new sources of job creation.

Given the importance of strong fundamentals in attracting both domestic and global interest in the tech entrepreneurship ecosystem, countries which fail to make broader reforms in education, good governance and create a business environment that supports entrepreneurship risk falling behind.[2]

Google has commissioned this study to identify areas for improvement in policies and regulations which affect tech entrepreneurship in Turkey, as part of a six- country study that includes the Russian Federation, South Africa, Nigeria, United Arab Emirates (UAE) and the Kingdom of Saudi Arabia (KSA).

For the purposes of this study, entrepreneurs are defined as those individuals who focus on building a rapidly scalable business venture with the aim of innovating, improving, or transforming the current way of doing things.[3,4] The entrepreneurship domain, according to our definition, includes the 'startup' and 'scale-up' phases of the business lifecycle when companies experience high growth in revenues and numbers of employees while validating their value proposition. Furthermore, we specifically address technology-driven entrepreneurship – companies with technology-enabled business models and a focus on hyperconnectivity between networks, people, businesses, things, and hardware.

Using these definitions, we began with comprehensive research of existing literature to identify factors that correlate with tech entrepreneurship success. We identified seven components explaining the strength of the ecosystem that supports tech entrepreneurship, while economic contribution and innovation creation measures pointed to the results achieved.

In our view, the inputs that form the preconditions for success and the resulting outputs feed each other in an iterative process, which determines the health of a tech entrepreneurship ecosystem.

[1] Selvam, M. and Kalyanasundaram, P. "Global IT/IT Enabled Services and ICT Industry: Growth & Determinants." http://globalbizresearch.org/Chennai_Symposium/conference/pdf/C549.pdf (accessed September 27, 2017)
[2] World Bank. "Digital Dividends." http://www.worldbank.org/en/publication/wdr2016 (accessed September 27, 2017)
[3] Schumpeter, J. 1942. Capitalism, Socialism, and Democracy. New York: Harper & Bros.
[4] Global Entrepreneurship Monitor (GEM) Global Report 2016/17, Global Entrepreneurship Research Association 2017

Factors such as the quality, connectedness, and efficiency of a tech entrepreneurship ecosystem – which we refer to as the inputs – create the conditions for sustainable success. Meanwhile, effectiveness in generating tangible results such as growth, employment, the creation of wealth along with further innovation – the outputs – cultivates a stronger ecosystem by attracting more of the required inputs. This holistic perspective is reflected in the framework we used to assess tech entrepreneurship success.

Based on our assessment, we identified leading and emergent countries in tech entrepreneurship, putting the USA, Singapore, Israel and UK at the top of the list. Identifying successful countries provided a filter for selecting best practices as well as setting performance indicators that aspiring countries such as Turkey can use to assess their status, identify improvement areas, and apply approaches that fit the nature of their own ecosystems.

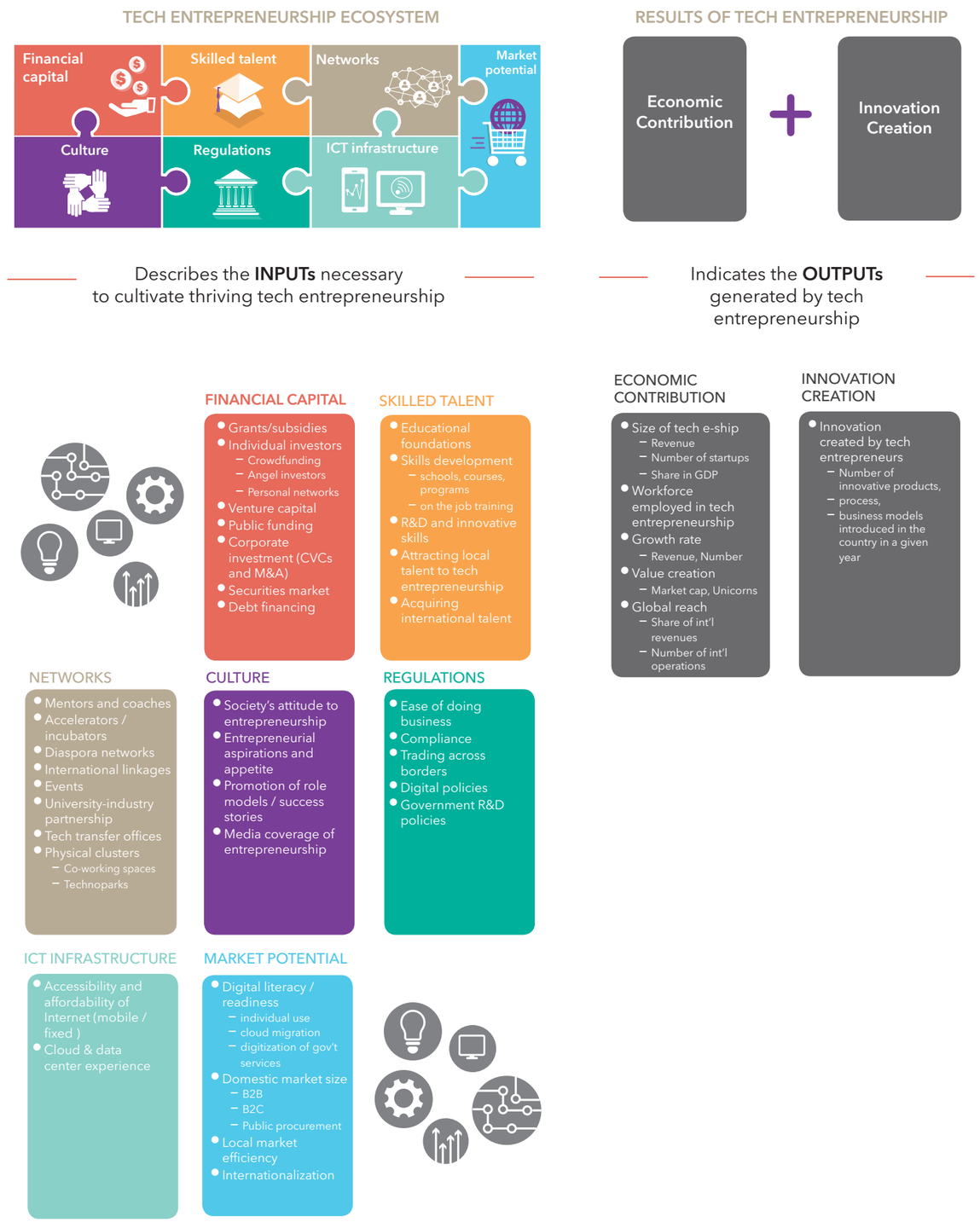
To put Turkey's status in context, we have compared input and output indicators for Turkey against a peer set of countries with comparable development stages, similar characteristics, or geographic proximity.

In the final stage of the study, we conducted extensive primary research in Turkey to complement the desk research. Whereas the desk research served to develop the structure of the tech entrepreneurship ecosystem and identify current initiatives that are in place to cultivate it, we gained insights and understood the context and impacts by conducting bespoke research with ecosystem participants, together with Girişimcilik Vakfı (Entrepreneurship Foundation). The policy recommendations that are part of this report are suggestions from the Turkish entrepreneurial community for further policy initiatives that will help strengthen the development of the tech entrepreneurship ecosystem in Turkey.

In total, we interviewed 25 stakeholders (representing different components of the ecosystem), spanning public and private as well as institutional and individual perspectives. The full list of participants is presented in the Acknowledgments section.

OC&C's framework for assessing tech entrepreneurship success

FIGURE I: THE TECH ENTREPRENEURSHIP ECOSYSTEM IS REPEATEDLY STRENGTHENED WITH TANGIBLE ECONOMIC RESULTS AND INNOVATION



Source: Literature Research, OC&C analysis

Tech entrepreneurship ecosystem – Inputs

The tech entrepreneurship ecosystem and its components constitute the inputs in OC&C's tech entrepreneurship success assessment.

One definition of an entrepreneurial ecosystem is:

"a set of interconnected entrepreneurial actors, organizations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies), and entrepreneurial processes (e.g. the business establishment, growth, levels of 'blockbuster entrepreneurship', number of serial entrepreneurs, degree of sell-out mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment."[5]

OC&C's Tech Entrepreneurship Ecosystem Framework (Figure II) presents the attributes outlined above, and the way in which they interact and influence one another. These seven components, working together, provide the habitat needed to generate successful tech entrepreneurships.

Best-in-class countries are able to offer **equity funding** sources in greater volume and variety (i.e. business angels, venture capital firms, and government investment funds). **Deep and efficient stock markets and the high frequency of deals** make the entrepreneurial challenge financially worthwhile and are instrumental in drawing in more resources – in terms of funding, skilled talent, and support – into the ecosystem.

These countries have a larger number of **highly skilled** employees and a labor force created by **education systems and talent attraction initiatives that support tech entrepreneurship.** These ecosystems are characterized by a **greater pool of scientists, engineers, and research universities** that foster an innovation culture.

Benchmarks demonstrate a superior level of **network development** that is characterized by the availability of entrepreneurial networks, startup associations, accelerators, incubators, co-working spaces, technoparks, etc. There are **stronger innovation linkages between academia and the private sector** such as joint-venture/strategic alliance deals, and industry-university collaborations.

In the best-practice countries, there is a higher **individual risk appetite**, coupled with **cultures that are more supportive of entrepreneurship**. **It is easier and less bureaucratic to start and run** companies as an entrepreneur, and the **risk of failure is better managed.**

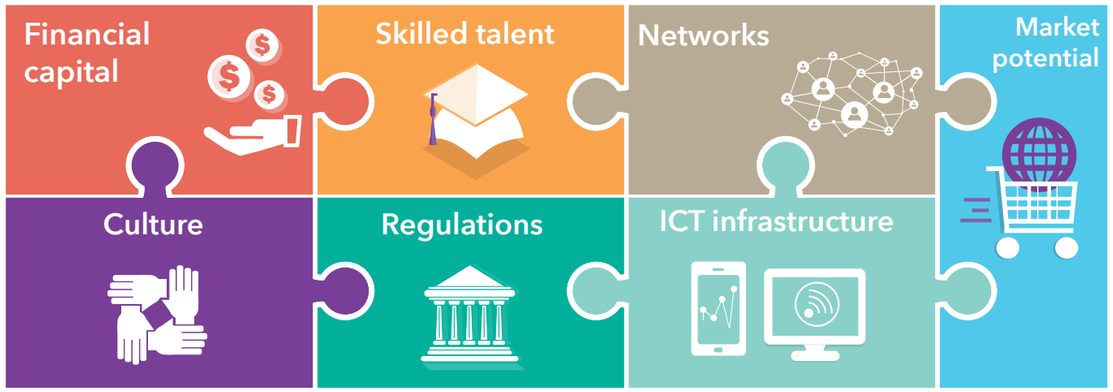
Supportive digital policies – laws related to data flow, cybersecurity, data privacy, IP protection, etc. – and **strong innovation capacity** steered by governments' R&D policies provide a sturdy backbone for the ecosystem. **Open foreign trade policies** enable these countries to internationalize their businesses.

Another fundamental differentiator is **reliable fixed and mobile internet infrastructures at affordable prices.** Digital policies that support **cross-border data flows** lead to **higher utilization of efficient, cost-effective global cloud services.**

Lastly, we also see that leading countries possess **considerable (rich) market potential and those that don't have a big enough market are globally oriented** from the start. In the domestic market, **consumer digital literacy is of great importance** as **consumers are then more likely to try new digital products,** thus creating attractive market conditions for B2C companies. In addition, advanced markets are efficient and competitive, with minimum barriers of entry for business startups.

[5] Mason and Brown, Entrepreneurial Ecosystems and Growth-Oriented Entrepreneurship, OECD LEEP Program and Dutch Ministry of Economic Affairs workshop paper, The Hague, Netherlands, Jan 2014.

FIGURE II: TECH ENTREPRENEURSHIP ECOSYSTEM FRAMEWORK



Source: OC&C analysis

Role of the government in strengthening the tech entrepreneurship ecosystem

While many actors are involved in the ecosystem, the role of government deserves attention. Government policy can affect all entrepreneurial actors and components of the ecosystem: resource providers, entrepreneurial connectors within the ecosystem, and the entrepreneurial environment of the ecosystem. The government's contribution is important because of its direct impact on the ecosystem through the creation of favorable terms and the provision of incentives for high-growth startups. Moreover, government exerts its influence on all components to create a constructive environment and facilitate interconnectivity between these components.

In the benchmark countries, the shift to knowledge-based industries has taken place both via favorable policies that support the development of each component of the ecosystem and greater government funding for high-growth firms.[6] Governments have played a leading role in successfully facilitating tech entrepreneurship ecosystems through their impact on all seven components of the ecosystem.

[6] Global Entrepreneurship Monitor, Global Report 2016/2017

Executive summary

Turkey at a glance

Turkey's vibrant economy is the 17th largest in the world with a GDP worth USD 857 billion. It's fueled by a population of 80 million and a GDP that's 60 percent driven by private consumption. **Building strong technology-driven sectors is an important pillar of the government's ambitions, due to continued need for economic growth and job creation** (driven by young demographics). Tech entrepreneurship has been recognized as key to achieving the government's ambitions and it has been deeply embedded into ministries' strategic plans.

The results of tech entrepreneurship – Outputs

Turkey's output performance is in the range of its peer set of markets. Turkey is relatively better positioned compared to peers in terms of entrepreneurial innovation creation and entrepreneurial growth and job creation expectations. Regarding the indicators for entrepreneurial innovation creation it's worth noting that Turkey performs well in trademark registration, but the same performance is not replicated when it comes to patents, especially international ones. Other areas that can contribute to economic growth, such as the prevalence of tech startups and sizable exit numbers, are at average levels. Like many similar economies, Turkey has yet to produce a tech 'unicorn' and the contribution of knowledge sectors to the economy has significant scope for growth. A comparison of Turkey's output performance against the benchmark set can be found on page 21.

Turkish tech entrepreneurship ecosystem overview – Inputs

Turkey's tech entrepreneurship ecosystem is one of the largest in the EMEA region and it is driven mainly by 'localized versions' of e-commerce, content, and SaaS business models that have proven successful elsewhere. The focus of tech entrepreneurship in Turkey is expected to evolve in response to technology developments and new business applications in the frontier ecosystems.

The Turkish government's commitment to innovation is strong and it includes a number of strategic plans and initiatives for the sector. There have been progressive reforms in the commercial codes and investment- friendly policies have been introduced. Turkey has a good, dynamic mix of consumer, SME and corporate sectors. The private sector business culture is close to western norms and a robust ICT infrastructure is in place to support knowledge sectors. The growing middle class and especially the younger generation are keen to adopt technological novelties. Moreover, the country has had a customs union with the EU since 1996 and most of its regulations are in line with EU guidance.

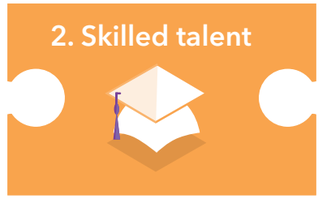
Our review of the Turkish tech entrepreneurship ecosystem (with active participants) identified four major areas for improvement:

- First, while public authorities have made a strong commitment to developing the tech sector, the effectiveness of those efforts could be improved with a more orchestrated effort.
- Raising funding is a major pain point in the Turkish tech entrepreneurship ecosystem and an increase in available funding would greatly increase the economic contribution made by tech entrepreneurship.
- Skill shortages and subpar foundational educational to build local talent hampers the development prospects of tech entrepreneurship.
- Addressing cultural norms that reward adherence to the status quo and systematically promoting the distinction between entrepreneurship and initiative taking would gradually mold new sets of behavior among the upcoming generation.

Successful tech startups require adequate and timely funding from a range of sources, tailored to their needs and stages of growth. **Angel investors, venture capitalists, corporate investment, government grants/funds and public offerings are the key pillars of a healthy funding environment.** In Turkey, all the required elements – apart from corporate investments and public offerings – are present in the ecosystem to a sufficient degree. The **Turkish government has introduced a number of initiatives designed to stimulate both angel and VC investment.** Tax exemptions have been the primary lever, though **new 'funds of funds' are also designed to stimulate investment.** To date, however, investments remain below desired levels. The private sector represents an untapped resource that could be used to address the current gap.

Though the ecosystem is large and growing, the low number of exits above USD 100 million may be constraining entrepreneurial aspirations. Exits increase the supply of capital available to young startups and serve as a positive signal of the viability of the tech entrepreneurship ecosystem. A continued focus on supporting exits will help the tech entrepreneurship ecosystem thrive.

To date most exits have taken place via strategic acquisitions, though some entrepreneurial establishments have been engaged in preparing an IPO. The Turkish stock exchange, Borsa Istanbul (BIST), which is an efficient, well-regulated market, **launched a private market 'Deal Room' to match startups and investors, which will probably lead to more tech companies maturing toward IPOs in the long term.**



Many ecosystems and hubs are driven by prevalence of high-quality talent, particularly in tech skills such as software development. Building skills also attracts employment, either directly or implicitly, as tech ecosystems around the world increasingly hire or contract skilled talent across borders.

Turkey has a large young population; hence dedicated attention to improving the current **STEM education quality to reach best-practice country standards would be immensely beneficial.**

The Turkish tech-entrepreneurial ecosystem is mainly made up **of young individuals with recent degrees in technology or related fields.** While tech skills are strong in the ecosystem, **few entrepreneurs possess the business acumen needed to fully commercialize an idea.** In part, this is due to the small numbers of entrepreneurs with full-time job experience. As a result, many **entrepreneurs are unaware of the demands of business and lack ideas rooted in solid plans or goals.** Many of them also lack the experience needed to build an international vision for their businesses.

In addition, high-technology employment in Turkey represents a smaller proportion of total employment and, while in some countries tech giants fuel the tech ecosystem with ex-employees, the number and operational span of Turkey's resident tech companies make this crossover rare. **The resulting skills shortage could be addressed by adopting targeted immigration policies and interventions to attract international startups in the region to Turkey.** This could quickly fill the short-term skills gap, which is preventing the ecosystem from fully developing in line with best-practice benchmarks.

Healthy tech entrepreneurship ecosystems have a dense array of players with strong relationships. This helps entrepreneurs exchange ideas, build teams, and get the resources they need to grow.

The **low number of qualified mentors** is an obstacle for the young startup ecosystem, which requires solid guidance.

The physical clustering of the Turkish ecosystem is represented by 41 university-led technoparks, as well as a variety of government labs/facilities and accelerators. **Technoparks are considered to be more attractive to established companies than startups, due to their locations and (low) costs. Startups tend to cluster around smaller, often private spaces in city centers close to strategic partners and customers. Authorities should emphasize allocating office space at affordable rates to entrepreneurs in central locations.** Independent organizations have focused on providing networking opportunities for entrepreneurs as well as fellowship programs to highlight the attractiveness of tech entrepreneurship.

One other area deserving focus will be enhancing **university-industry collaboration**. Most of the existing university Technology Transfer Offices (TTOs) could be improved in terms of their internal processes, excelling in special areas, as well as establishing effective networks with industry. Authorities would do well to make these initiatives priorities for improvement.

In highly entrepreneurial cultures people are comfortable with uncertainty, have positive associations with individuality and competition, and adhere less to established norms and rules.

Mainstream Turkish business culture has some contradictory characteristics such as hierarchies (especially in family-owned businesses and conglomerates), clear rules and roles, and an avoidance of competition and conflict. These characteristics can play a limiting role in promoting an entrepreneurial spirit.

Limited interaction between the corporate sector and tech startups means that few professionals understand the culture of entrepreneurship. **Through increased interactions in formal and informal environments, the expectations of corporate investors and those of other private sector players can be better aligned with entrepreneurial ambitions.**

Role models typically play a key role in driving (and, structuring) entrepreneurship ambitions and, although they are few in numbers, **Turkey's successful domestic and international entrepreneurs can serve as effective role models in local ecosystems, given the right platform.**

Turkey's candidacy for the European Union helped bring the business environment in line with that in many EU countries and **amendments to Turkish trade law have enabled smoother procedures for establishing a business. However, compliance with this regulatory structure is proving burdensome for early-stage startups which are mainly concerned with minimizing their cash burn rates.** Several ministries have announced plans to address concerns and customize regulations to promote agility.

The benefits of the internet economy are prodigious, but the rise of the internet economy also brings growing concerns about privacy, security, crime, and anticompetitive practices. **Overall, Turkey's digital policies are largely in line with international standards for IP protection, cybercrime, and net neutrality. Prerequisites identified in the Turkish personal data protection law** for the use of international data center services by financial institutions and telecom companies **cause many other private sector establishments to hesitate to migrate to cloud services.**

Timing lags between international and domestic regulatory updates create delays for entrepreneurs who want to experiment with new technologies. Many of the **implementation challenges faced by tech startups could be addressed by getting them involved in regulatory development at an earlier stage.**

R&D spending in Turkey is currently at a low level (1% of GDP), but (fortunately) the contribution made by the private sector is strong. Since entrepreneurs are at the forefront of commercialization of innovation, countries with high public and private R&D activity create more opportunities for entrepreneurship. The government's **ambitious goal to triple R&D spending to 3% of GDP will create opportunities for the thriving tech entrepreneurship ecosystem**, in part due to large expected increases in the number of researchers and public procurement programs.

Wide penetration of high-speed internet at affordable prices in Turkey (at much more attractive levels compared to some best-practice benchmarks), strengthens the ability of the ecosystem to support rapid knowledge sharing and dissemination of new technologies to the wider population. It also makes it easier for the wider market to consume tech-enabled products and services. The **coverage and accessibility of ICT infrastructure has been very effective in supporting the existing tech entrepreneurship ecosystem.**

The interview participants consider mobile broadband to be strong, but also make the point that, **if there were investments in wider penetration of affordable fiber broadband, this would benefit the entire ecosystem.**

7. Market potential

The size of the addressable market for tech startups is a function of the national economy, the digital literacy of all stakeholders, internet/mobile coverage, and consumer habits, such as the propensity to try new products and services.

Turkey's digital economy has grown rapidly in recent years, with the e-commerce market alone growing 31% in 2015 and 24% in 2016, to USD 10 billion. The FinTech sector is estimated to be worth USD 15 billion and it's growing at approx. 14 percent per year. The SaaS sector accounted for USD 4 billion (TRY 11.9 billion) last year.

Despite Turkey's large population (approx.80mln), **the addressable population is estimated at 30 million,** given disposable income levels and online shopping penetration. Achieving scale domestically could be significantly helped by **government procurement programs tailored to tech entrepreneurship.**

Local – and even international – tech entrepreneurs should consider using **Turkey as a test market and springboard for ideas destined for international markets**. Internationalization could be assisted by the government by amending the coverage of programs such as the 'Turquality' export initiative to include tech entrepreneurs.

Recommendations designed to strengthen the tech entrepreneurship ecosystem

Insights into the Turkish tech entrepreneurship ecosystem led to the articulation of a series of policy recommendations that could be considered to address gaps and foster a strong ecosystem. These recommendations are grouped under four main headings:

- Focus on expanding tech entrepreneurs' access to a create supportive resources and markets
- Raise tech entrepreneurship skill levels
- Engage the private sector in tech entrepreneurship development
- Strengthen the efficiency and efficacy of public sector efforts

Legend

FINANCIAL CAPITAL | SKILLED TALENT | NETWORKS | CULTURE | REGULATIONS | ICT INFRASTRUCTURE | MARKET POTENTIAL

Details of the specific recommendations under each group can be found on page 62.

Conclusion

Turkey's geography, culture, population and economic growth make it well-positioned to benefit from tech entrepreneurship. Ambitious goals and continued investments have demonstrated strong commitment from the government to strengthen tech entrepreneurship. With adjustments to make public incentives more effective, encouragement of private sector participation especially in funding, a special focus on improving STEM skills and business acumen and introduction of entrepreneurship as a valued concept in schools, the tech ecosystem is poised to grow in line with the government's ambitions.

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Turkey at a glance

Turkey is the 17th largest economy in the world with a GDP worth USD 857 billion. It ranks 6th in comparison to European Union countries. According to the OECD's national quarterly accounts, Turkey's growth rate between 2003 and 2016 was 5.6%, ahead of Chile, Poland, South Africa, and Brazil.

Prudent fiscal policies and major structural reforms since 2003 have helped place Turkey 54th and 52nd (out of 138 countries) for macroeconomic environment and goods market efficiency, according to the Global Competitiveness Index .[7]

The domestic economy is particularly vibrant. Turkey's private sector benefits from a population of 80 million and a middle class that has doubled in less than two decades to reach 48 million people. As much as 60% of GDP comes from private consumption and SMEs make up a healthy 54% of the economy. Partly due to its geographical significance, the market is especially attractive to foreign enterprise, and more than 50,000 foreign companies now operate in Turkey.

In addition to the strong domestic demand, through its custom union agreement with the EU the country has direct trade access to 510 million Europeans.[8] Moreover, Turkey's location links it to 1.6 billion people and USD 7.1 trillion of trade volume within a four-hour flight range.[9]

Alongside all these favorable attributes, Turkey has also been affected by the general shift away from emerging markets and the volatility in the global financial environment. Also, a number of domestic and geopolitical events since 2013 have weakened the country's investment profile. Nevertheless, the country has proven to be inherently resilient; this can be seen in its rapid recovery from the 2008 global financial crisis ahead of many nations, including some of the largest in the EU. Such a comeback is due to focused strategies and effective corrective measures.

FIGURE 1. MACROECONOMIC INDICATORS FOR TURKEY

	Value	Rank (192)
GDP (USD)	**857 B**	**17**
GDP per capita (PPP adj. USD)	**25 K**	**57**
Population (millions), 2016	**80**	**19**
Rate of population aged 15-19 over those aged 55-59	**1.79**	

	Value
SME contribution to GDP, 2015	**54%**
Consumer expenditure as a % of GDP	**60%**
Stock market cap as a % of GDP	**20%**
Stock market traded as a % of GDP	**33%**

Source: IMF, World Bank, Global Entrepreneurship Monitor, Euromonitor, AT Kearney, Economist, World Economic Forum

[7] World Economic Forum. "The Global Competitiveness Report 2016-2017" https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1 (accessed September 10, 2017)
[8] Investment Support and Promotion Agency of Turkey. "Why invest in Turkey". http://www.invest.gov.tr/en-US/infocenter/publications/Documents/WHY-INVEST-IN-TURKEY.pdf (accessed September 17, 2017)
[9] Ermut, Arda President, Investment Support and Promotion Agency (ISPAT)."Turkey's FDI Potential & Opportunities Going Forward", Private Equity Investments in Turkey and its Environs (accessed August 15, 2017)

Turkey's demographic structure creates a substantial employment challenge for the future. The ratio of the population aged 55 to 59, those due to leave the workforce versus those due to enter it (those aged between 15 and 19), is 1 to 1.79. This ratio necessitates the creation of new jobs, and about 750,000 will be needed each year before the ratio evens out. There are already concerns that the private sector will be unable to meet this demand, given their growth trajectory and focus on efficiency. Combating the threat of long-term unemployment will therefore mean creating new high-impact enterprises.[10] This will also serve the government's longstanding ambitions to raise the average individual's standard of living above USD 15,000 GDP per capita.[11]

Entrepreneurship, especially that involving technology, is a critical lever which Turkish policymakers can use to achieve goals such as finding new sources of economic growth and employment. Tech entrepreneurship will play a key role in new technology development, the reduction of inter-regional developmental differences, and strengthening international competitiveness. Driving job creation via tech entrepreneurship in particular requires improvements to the ecosystem.

Government plans spanning industry, technology & science, information and telecommunications, trade and finance are therefore committed to strengthening the knowledge society by including it as a special focus area in their agendas. Many ministries have already developed their own dedicated initiatives, strategic plans, and supportive regulations to meet transformational goals related to technology, information and entrepreneurship.

[10] Erkut, Erhan. "Entrepreneurship in Turkey and Universities." http://erhanerkut.com/girisimcilik/turkiyede-girisimcilik-ve-universiteler/ (accessed August 17, 2017)
[11] Current 2016 GDP per Capita is USD10,800 (not PPP adjusted)

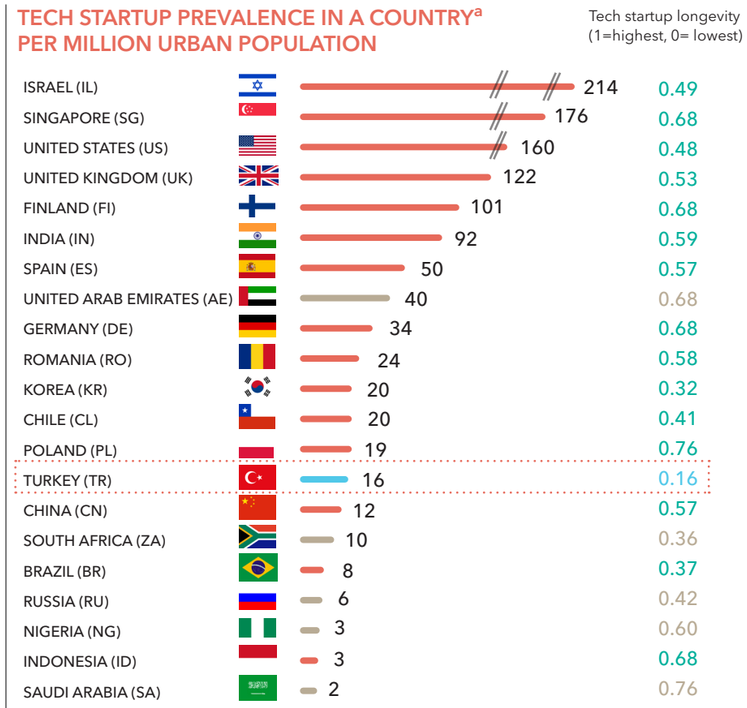
The results of tech entrepreneurship – Outputs

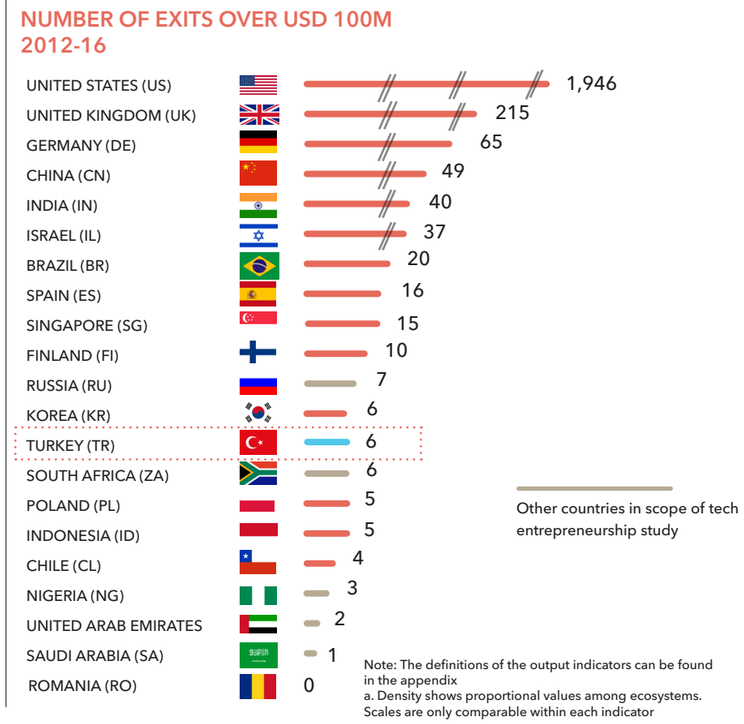
Against this backdrop, Turkey's output performance is in the range of its peer set of markets.

Turkey scores relatively better compared to peers in terms of measures designed to create entrepreneurial innovation as well as expectations about entrepreneurial growth and job creation. When it comes to the indicators for entrepreneurial innovation creation, it's worth noting that Turkey performs well in trademark registration, but the same performance is not replicated when it comes to patents, especially international ones. Other areas that can contribute to economic growth, such as the prevalence of tech startups and sizable exit numbers, are at average levels. Like many similar economies, Turkey has yet to produce a tech 'unicorn' and the contribution of knowledge sectors to the economy has significant scope for growth.

Turkey vs. benchmark countries

ECONOMIC CONTRIBUTION



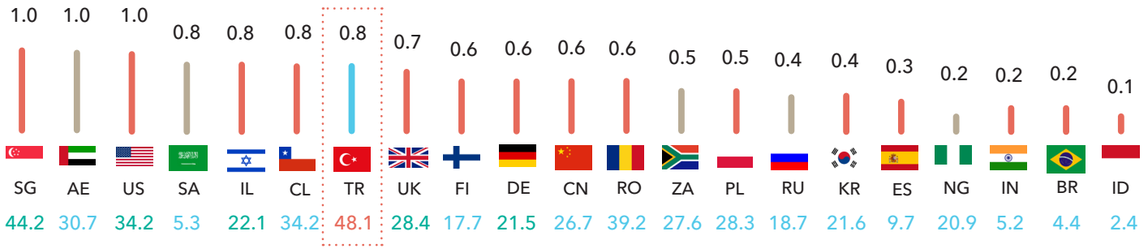


Note: The definitions of the output indicators can be found in the appendix
a. Density shows proportional values among ecosystems. Scales are only comparable within each indicator

ECONOMIC CONTRIBUTION

ENTREPRENEUR'S GROWTH ASPIRATION SCORE[b]

A scoring based on percentage of entrepreneurs with a sophisticated growth strategy aspiring to grow at least 50% in the next 5 years and attract VC funding (1=highest, 0=lowest)



HIGH JOB CREATION EXPECTATION (% OF ENTREPRENEURS)

Other countries in scope of tech entrepreneurship study

ABILITY TO CREATE GLOBALLY RECOGNIZED "UNICORNS"[c]

Technology start-ups with over USD 1 billion valuation in benchmark countries

CONTRIBUTION OF KNOWLEDGE SECTORS TO THE ECONOMY

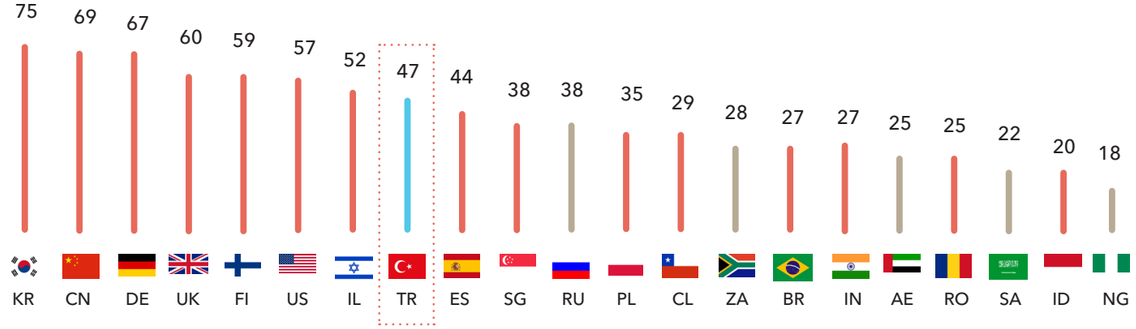
ICT & High-tech exports, international data flows and IP receipts (1=highest, 0=lowest)

Note: The definitions of the output indicators can be found in the appendix
b. A scoring based on percentage of entrepreneurs with a sophisticated growth strategy aspiring to grow at least 50% in the next 5 years and attract VC funding
c. Unicorns in tech-related categories are taken into consideration

INNOVATION CREATION

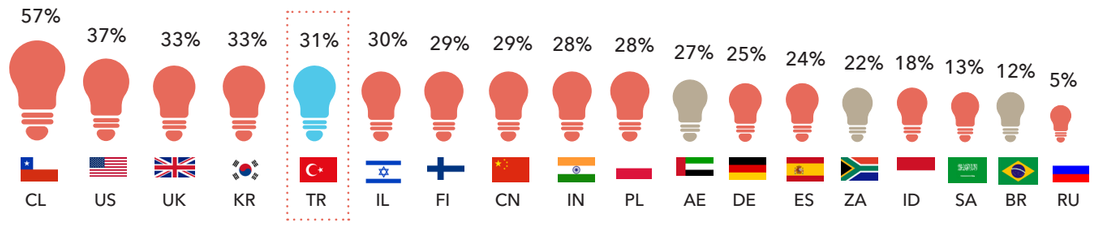
INNOVATIVE OUTPUT DENSITY

The abundance of knowledge creation and intangible assets in a country (out of 100)



ENTREPRENEURIAL INNOVATION CREATION[d]

Rate of entrepreneurs involved in new product or service creation



Other countries in scope of tech entrepreneurship study

Note: The definitions of the output indicators can be found in the appendix
d. Some benchmark set countries are not shown due to data availability
Source: OC&C analysis based on World Bank, GEM, GEDI, Crunchbase, INSEAD, McKinsey, CB Insights

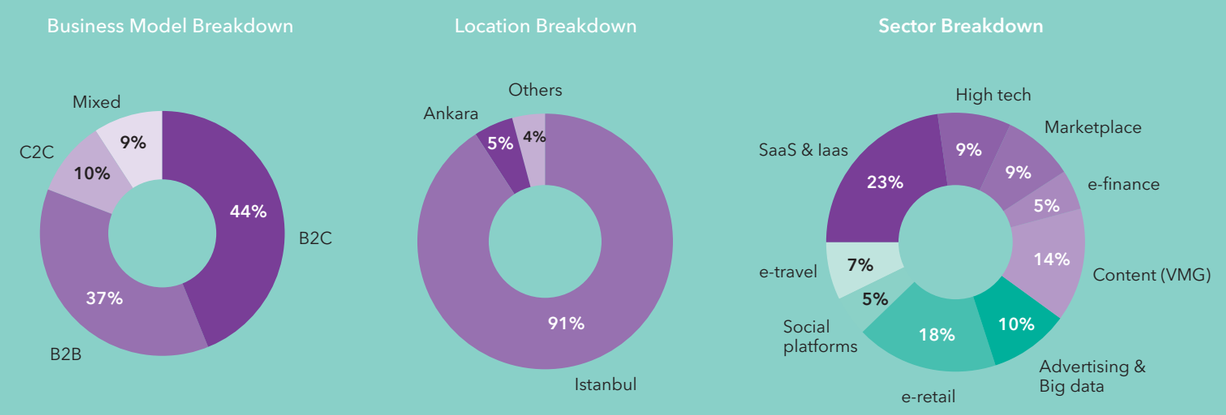
Turkish tech entrepreneurship ecosystem overview

The Turkish tech entrepreneurship ecosystem is considered to be one of the largest in the MENA and Eastern Europe regions and it is one that is poised for substantial growth. According to a recent study by OC&C, mobile app developers alone have contributed c. TRY 10 billion (c. 0.4%) to the Turkish economy in 2016. This contribution from mobile app developers is expected to grow to almost 1% of the Turkish economy by 2023.[12]

A snapshot of the top 100 Turkish startups reveals that most are localized versions of proven business models in advanced countries, adapted to the Turkish market. Istanbul – the business center of the country – leads in tech entrepreneurship activity, followed by Ankara, where more research-driven initiatives are flourishing. With the advancement of the tech entrepreneurship ecosystem, a better spread of business activity should be possible.

Some Turkish startups have begun to expand their businesses abroad and this is expected to help increase the number of firms that bring innovative, rather than adapted solutions to the market. E-commerce, content, and SaaS are the largest segments in the Turkish startup ecosystem.

FIGURE 2: PROFILE OF THE TOP 100 TECH STARTUPS IN THE TURKISH ECOSYSTEM



VMG: Video, Music, Games
Source: OC&C analysis based on Crunchbase

[12] "Impact of Android on the Turkish Economy", November 2017 , OC&C Strategy Consultants

The focus of tech entrepreneurship in Turkey is expected to evolve following technology developments and new business applications in frontier ecosystems . Out of 100 European startups that have raised over USD 20 million in 2016, only nine were e-commerce players. Software startups (24) received the lion's share, closely followed by FinTech (23) and marketplace (20). There is a shift from conventional B2C business models to more sophisticated B2B and C2C models.[13] According to KPMG's tech trends index, which covers the US and the EU, digital payments, autonomous vehicles and cloud computing top the startup list as of December 2017.[14] Experts anticipate that more tech startups will focus on artificial intelligence (AI) and machine learning, which are the key technologies in a data-driven world. AI solutions will enable startups to tap into the chat bots market, which is expected to replace some apps and foster "deep tech" solutions driven by machine learning. This trend can already be observed in UK and Singapore. [15,16]

In an effort to vitalize the Turkish tech entrepreneurship ecosystem public authorities have taken a number of constructive steps to support the development of technology and innovation-driven business sectors.

Government regulations have been particularly effective at stimulating activity in areas including:

- accrediting individuals wishing to become business angel investors
- collaborating with the European Investment Fund (EIF) to create a 'fund of funds' for the equity investment market
- inaugurating technoparks and tech transfer offices to mobilize universities to support tech endeavors
- supporting university accelerator programs by using their services to filter applicants for Scientific and Technological Research Council of Turkey (TUBITAK) grants.

[13] Userovici, Jonathan (idinvest Partners). "These 100 European Startups Raised +$20 Million in 2016". https://medium.com/startup-grind/the-100-startups-which-raised-more-than-20-million-dollars-in-europe-and-in-the-us-in-2016-fb777d69a735 (accessed December 20, 2017)

[14] "Startup Trends Index". KPMG http://startuptrendsindex.kpmg.com/#TechTrends (accessed December 20, 2017)
[15] Techworld. "UK Startup trends to watch in 2017: AI, Brexit and bots". https://www.techworld.com/startups/startup-trends-watch-in-2017-ai-brexit-bots-3652077/ (accessed December 20, 2017)
[16] "Live Streaming, Gaming Apps And Chat Bots - Here Are 6 Trends We're Excited For In 2017!". https://vulcanpost.com/599289/2017-trends-we-are-excited-for/ (accessed December 20, 2017)

In a 2016 statement, Deputy Prime Minister Mr. Mehmet Simsek summarized the government's initiatives designed to grow the knowledge economy and tech sector as follows:

> **"We need to increase the portion of knowledge-intensive, technology-intensive, high-technology products in our total production and exports which is currently standing at less than 5%. In order to increase this, we need R&D and an ecosystem for it. An important R&D reform was passed by the Parliament in February (2016), and now we are gradually establishing the elements of an ecosystem for innovation, R&D, and commercialization of R&D. We have established the fund of funds, and as the Treasury, we will make a TL 500 million (EUR 150 million) contribution to this fund, a portion of which is already delivered.**
>
> **Our aim is to provide financial support to promising companies that can produce high-added value products in the future. Angel investors already showed interest. We have taken new steps in venture capital. We are restructuring the Development Bank. The draft of the crowdfunding plan is ready to be published. We will also pass the Patent Law in cooperation with the opposition parties during this period, as Mr. Minister noted. In fact, many steps were taken for improving R&D, with incentives and an ecosystem. Important steps were taken for commercialization of R&D. As such, the current environment in Turkey is favorable, and the necessary supports are in place."**

Source: "Trust in Turkey, Produce in Turkey" conference held by Istanbul Chamber of Industry, 12 August 2016, (www.iso.org.tr)

FIGURE 3: MAJOR ACTORS WITHIN THE TURKISH TECH ENTREPRENEURSHIP ECOSYSTEM

a. Startups that are founded after 2010 and have technology-related businesses
Source: Startups Watch, Crunchbase, Teknosektor, Ministry of Science, Industry and Tech., Idema, Doğru Tercihler, Banks Association of Turkey, Council of Higher Education, ICTA

In our review of the Turkish tech entrepreneurship ecosystem – with active participants in roundtable discussions and interviews – four major areas for improvement came up frequently:

While public authorities have made a strong commitment to developing the tech sector, the effectiveness of those efforts could be improved with a more orchestrated effort

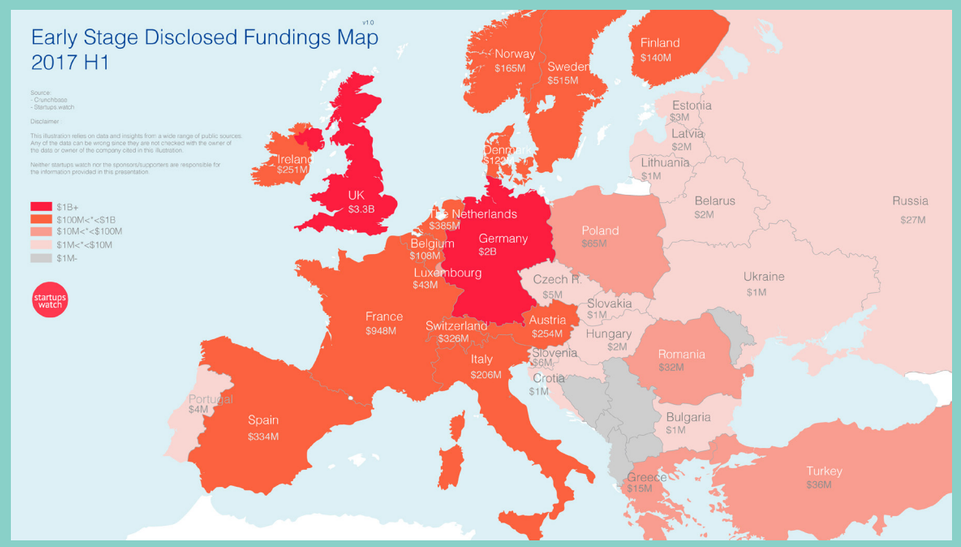
Turkish government ministries have introduced a number of frameworks, programs, and regulations designed to improve the tech sector. However, ecosystem participants indicate that ecosystem institutions, though well intended, are somewhat ineffective, and collaboration among public institutions as well as public–private ecosystem participants is rare. While the coordination challenge was addressed with the establishment of the "Turkish Entrepreneurship Council" in 2012 – KOSGEB is the coordinating body for the 32 national bodies involved – the interviewees from the ecosystem feel that the council's impact on promoting tech entrepreneurship can be improved.

Assessing the effectiveness of government programs and incentives intended to deliver objectives needs to be improved. Investing time to evaluate what does – and does not – work in the initiatives taken to foster the tech entrepreneurship ecosystem would yield quick-win opportunities and highlight where revision is needed.

Raising funding is a major pain point in the Turkish tech entrepreneurship ecosystem and an increase in available funding would greatly increase the economic contribution made by tech entrepreneurship

Early-stage funding for startups in Turkey since 2010 has been USD 400 million, with USD 80 million the highest investment generated in a single year. Turkey is 18th in terms of early-stage funding for startups among 36 European countries.[17]

FIGURE 4: DISCLOSED EARLY-STAGE FUNDING IN EUROPE (2017 1ST HALF)



Source: Startups Watch

[17] Ünsal, Serkan. "2017 H1 Funding Activities in Turkey & Europe." https://startups.watch/ (accessed July 18, 2017)

The recent economic volatility negatively affects investors' expectations of returns and shortens the expected delivery time of results – prerequisites that few tech startups can satisfy. Investors prefer ventures that have a working model and are generating cash flows. Therefore, the supply and demand equilibrium for early-stage equity funding is suboptimal.

The low activity levels in the Turkish tech entrepreneurship ecosystem are often attributed to the shortage of large exits (above USD 100 million). To date only a handful of prominent exits serve as models of success: Delivery Hero's acquisition of Yemek Sepeti (USD 589 million), eBay's purchase of Gittigidiyor (USD 218 million), Naspers' acquisition of Markafoni (USD 200 million+), Pozitron's sale to Monitise (c. USD 100 million). Abraaj Capital's investment into Hepsiburada.com and majority acquisition of Arvento by Investcorp also created excitement in the ecosystem. In order to cultivate a thriving equity financing environment however, the number of exits need to increase at a faster speed.

Skills shortages and subpar foundational educational efforts to build local talent hamper the development prospects of tech entrepreneurship

Turkey's current level of STEM education limits fostering the critical thinking, problem solving, and research skills that drive innovative cultures and strong tech ecosystems. Furthermore, most universities fall short in delivering research-based learning, which in essence is the springboard for most entrepreneurial endeavors. Coding and software development is not sufficiently emphasized in schools or extracurricular training programs. Lastly, business acumen and English language skills are at the level needed to create strong international entrepreneurial candidates. Reforms at every stage of education will surely lead to the creation of a knowledge society.

Addressing cultural norms that reward adherence to the status quo and systematically promoting the distinction between entrepreneurship and initiative taking would gradually mold new sets of behavior

Some elements of the Turkish culture such as strong adherence to hierarchical structures, accepting the status quo and proven paths to success are barriers to high-impact entrepreneurial behavior. Turkish people tend to describe themselves as having a strong entrepreneurial drive. However, the ecosystem participants feel that this is a misconception and what is really meant is that Turks are initiative takers.

Building a supportive culture for tech entrepreneurship can be considered to be the glue that binds the ecosystem together. Therefore, the systematic infusion and promotion of traits that guide entrepreneurial behavior are expected to transform the attitudes and behaviors of the upcoming generation.

Insights into ecosystem components

Successful tech startups require adequate and timely funding. Different sources of capital tailored to the startups' need accompanied by guidance and support is required for healthy growth.

There are five main sources of equity finance available for entrepreneurs:

- **Individual investors** (personal networks, angel investors, crowdfunding) – at the seed stage.
- **Venture capital** – (institutional investment) from seed to later stages with high return expectations.
- **Public funding** (grants, sovereign investment funds, funds of funds) – to fill funding gaps at various stages and stimulate priority sectors.
- **Corporate investment** (direct investment and via corporate venture funds (CVCs)) – to acquire industry-specific solutions or for corporate innovation exposure.
- **Public Offerings** in the local and foreign stock exchanges that also signals success to wider audience.

Currently, the equity funding needs of the Turkish tech ecosystem are mainly served by a mix of government grants, business angel investors, and venture capitalists, with limited involvement from corporate investors or lending banks.

Most companies exit via strategic acquisitions, though some undergo IPO processes. However, there has not been any public offering of a tech company in the last five years, despite existence of few eligible candidates.

FIGURE 5: RECENT DEVELOPMENTS FOR ENTREPRENEURS IN THE TURKISH FUNDING LANDSCAPE

	RECENT DEVELOPMENTS IN TURKISH FUNDING SCENE
GOVERNMENT GRANTS	Two institutions provide government grants: KOSGEB provides grants to SMEs and TUBITAK provides grants for innovative / research based entrepreneurial activities.
PUBLIC FUNDING	Around EUR 250 million allocated to funds of funds (namely Turkish Investment Fund and Turkish Growth and Innovation Fund) in private equity, venture capital, business angels, and early stage investments in Turkey.
ANGEL INVESTORS	The Business Angels Law enacted in 2013 allows high net worth individuals to deduct either 75 or 100 percent of participation shares held for two years in Turkish private venture companies from personal income taxes.
VENTURE CAPITAL	Turkish VC firms are subject to lucrative capital gains tax exemption on shares held over two years, and an applicable corporate tax rate of 20 percent.
PRIVATE MARKET	Borsa Istanbul's private market enables the communication between start-ups looking for funding, shareholders seeking liquidation opportunities and investors willing to invest in start-ups. Total investment amount reached over TRY 30 million from its establishment in early 2014 until late 2016.
CROWDFUNDING	The regulatory framework for crowdfunding is in progress.

Source: OC&C analysis based on Bigpara, Borsa İstanbul, Undersecretariat of Treasury, EIF

"[The] ecosystem lacks financing. If the existing talent and founding teams only have ten doors to knock on for money, they will not stay in that ecosystem for long. Without the financial institutional capital, it is a big challenge to motivate and retain best human capital in the country."- ***Rina Onur Şirinoğlu, General Partner, 500 Startups Istanbul***

FIGURE 6: PUBLIC FUNDING PROGRAMS PROVIDED BY THE MINISTRY OF SCIENCE, INDUSTRY AND TECHNOLOGY

DIRECT SUPPORT

Ministry of Science, Industry and Technology

TÜBİTAK – The Scientific and Technological Research Council of Turkey		KOSGEB – Small and Medium Sized Industry Development Organization	
Program	Support	Program	Support
1507 – Initial R&D Support	75% of expenditure up to TRY 500K	New Entrepreneurship Support	Grant - TRY 50K + TRY 100K interest free loan
1512 – Tech Entrepreneurship Capital Support	Grant - TRY 150K	Tech Products Marketing Support	Grant - TRY 150K
		R&D and Innovation Support	Grant - TRY 450K

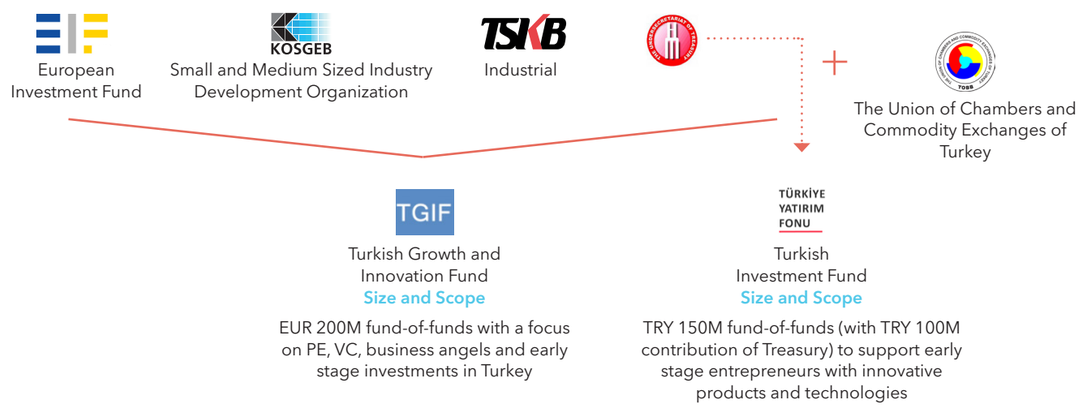
A number of government grants and funds funnel capital into startups though these vehicles could be better tailored to the needs of tech startups

- TUBITAK and KOSGEB specialize in adjacent disciplines to tech entrepreneurship and they are operated by civil servants whose expertise is not sufficient to address tech entrepreneurs' challenges (either academic or more involved with traditional business sectors).
  - KOSGEB programs in particular are designed for increasing business literacy and supporting traditional small businesses, and are inconsistent with the requirements of tech startups.
  - TUBITAK programs designed to promote scientific research and R&D have effectively spurred new projects, though commercialization and market-related aspects haven't typically been included in the grant considerations. The project management element of these programs requires recipients to acquire additional resources to manage them.
- Grant programs often work on a reimbursement model that is dependent on a prolonged approval process. In practice, this means that the entrepreneur must already have funds available, which limits the number entrepreneurs who can participate.

The government's 'fund of funds' approach is regarded as the best method to offer financial public support to high-impact entrepreneurship

- The government has demonstrated its clear intention to vitalize venture capital activity in Turkey by launching a number of 'fund of funds' to invest as an LP in local VC funds.
- The 'fund of funds' approach is regarded as the best method to offer financial public support to high-impact entrepreneurship by placing a combination of public and private capital under private sector management.
- First fund, EUR 155M, was introduced in 2007 – Istanbul Venture Capital Initiative (iVCi) in collaboration with European Investment Fund (EIF). The fund was fully committed among 10 recipients. Majority of the recipients of the funds were private equity firms that were not particularly active in technology sectors or startups.
- A second 'fund of funds' was established in May 2016 - The Turkish Growth and Innovation Fund (TGIF) to support innovative and technology oriented businesses with a rapid growth potential. TGIF targets 40% of its aggregate commitments to be invested in funds which have a focus on investments into seed, early-stage and startup businesses; suitable technology transfer accelerators or investments involving business angels.[18]

FIGURE 7: CURRENT 'FUND OF FUNDS' AVAILABLE IN THE ECOSYSTEM



Source: EIF, TOBB

[18] "EUR 200 million Turkish Growth and Innovation Fund officially launched" Date: 12 May 2016,European Investment Fund http://www.eif.org/what_we_do/equity/news/2016/turkish_growth_innovation_fund_launched.htm

There is a supportive regulatory framework for business angel investment, but this hasn't yet translated into momentum in angel investment

- 15 accredited angel networks in Turkey match startups and angels. Despite programs designed to stimulate investment, the number of active angel investors in Turkey is 424, only a quarter have ever made an investment, and just USD 10 million has flowed into the ecosystem from this group.
- Most of the bottlenecks to angel investment relate to long procedures for accreditation, the requirement to disclose the full investor assets, misalignment of how tax relief is given (exemption) and how it's paid (salary withholding), and pre-approval mandates for each investment.

Venture capital's challenges in fundraising can be partially addressed by backing of the government's 'fund of funds'

- In recent years, the Turkish VC sector has experienced a withdrawal of capital and interest from the international investment community. This trend may have a negative impact on the ecosystem since only 33 percent of the funds raised in Turkey are sourced domestically in 2016.[19]
- Sources estimate that about USD 200 million in VC funding is available in Turkey.[20] Many firms are mainly active in pre-seed or seed (15 in total) and early-stage investment (13 in total) stages, with expansion stage equity funding generally absent.
- The limited number of Turkish venture capital firms despite lucrative tax incentives and an applicable corporate tax rate of 20 percent is attributed to limited investment options available in the market. Many funds indicate that they were unable to invest all or most of their capital.
- The private pension auto-enrolment system is perceived as a further fund resource, where participants are allowed to allocate a portion of the standard fund structures to venture investments with no minimum threshold levels. Ecosystem experts suggest that there should be a minimum and it should not be less than one percent.

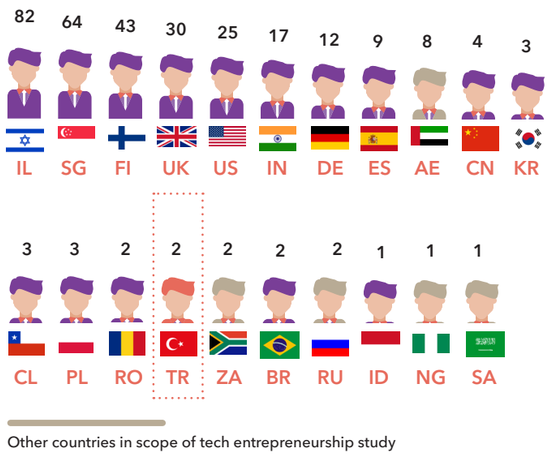
FIGURE 8: SEED ROUND VELOCITY

Note: Figure shows number of seed rounds per million urban population in each country
Source: Startup Bootcamp, Crunchbase, OC&C analysis

[19] Dealroom. "2016 European Venture Capital Report". https://blog.dealroom.co/wp-content/uploads/2017/01/2016-European-Venture-Capital-Report.pdf (accessed November 27, 2017)

[20] Durgun, Cankut. "Turkey's VC fund of funds." http://cdurgun.com/2016/02/turkeys-vc-fund-of-funds.html (accessed October 3, 2017)

FIGURE 9: NUMBER OF INVESTORS PER MILLION URBAN POPULATION

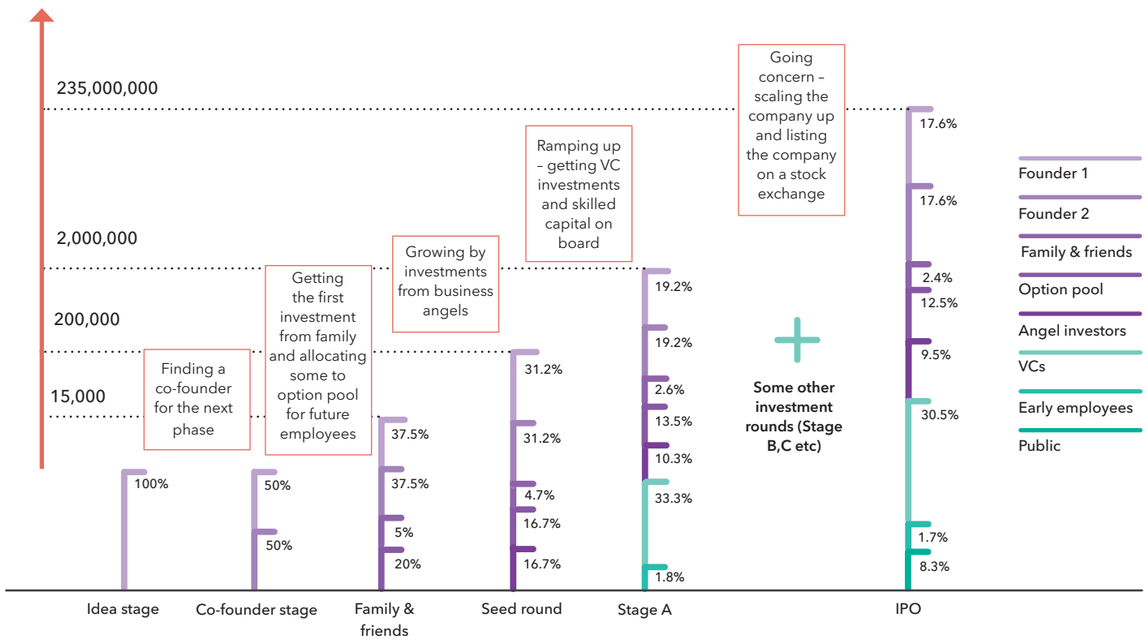


Note: Figure shows number of investors per million urban population in each country
Source: Startup Bootcamp, Crunchbase, OC&C analysis

The private sector investments represents an untapped resource to stimulate the Turkish technology ecosystem missing opportunities to address internal innovation challenges and portfolio diversification

- Turkish corporations rarely make strategic investments into tech startups. Reluctance to do so is mostly associated with risk averseness heightened by increased cost of capital and economic conjuncture in the recent years.
- Other reasons cited for Turkish corporates' hesitation to invest in startups are vast difference in business cultures of the two models. Differences prevent established entities from perceiving startups as potential sources of value creation.
- Most lack the skills to adequately evaluate and select high-potential entrepreneurial ventures to invest, in-house.
- Corporates are not willing to create separate mechanisms of governance with different management structures, schemes and employee profiles to tackle investment into startups.

FIGURE 10: STAGES OF EQUITY INVESTMENT INTO A TECH COMPANY

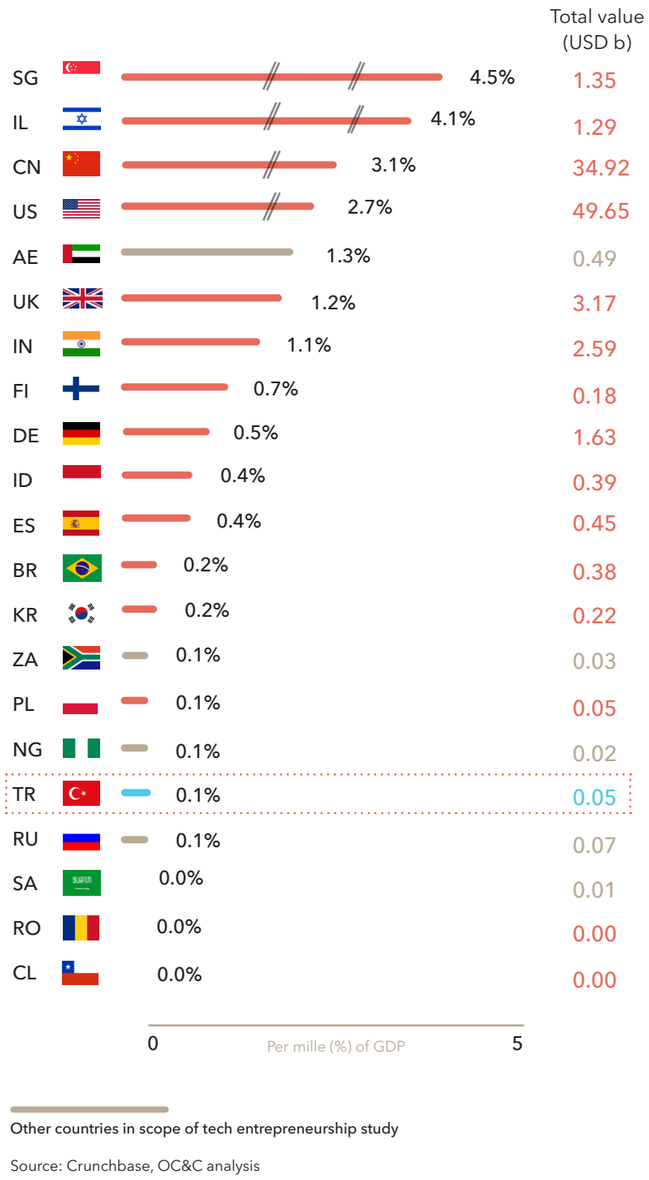


Note: The Equity shares in investment stages are illustrative
Source: Anna Vital

Exits which are rare in Turkey are crucial for the completion of startup lifecycle and the sustainability of the ecosystem by supplying venture capital and serving as positive signal of the viability

- To date, government action plans and incentives have mostly focused on increasing the number of early-stage startups, given the infancy of Turkish startup ecosystem. Government efforts could be extended to include exit realization for tech entrepreneurs to create a positive feedback loop.
  - One such example is Borsa Istanbul's 'Deal Room', the private market, designed to connect startups and investors. Still in its infancy, it's positioned to increase the number of tech startups eligible for IPO stage in Borsa Istanbul in the future.
- Other opportunities include introducing incentives to promote startup acquisitions by larger established companies, which would strengthen both companies' market positioning.

FIGURE 11: VC INVESTMENT MAGNITUDE (2016)



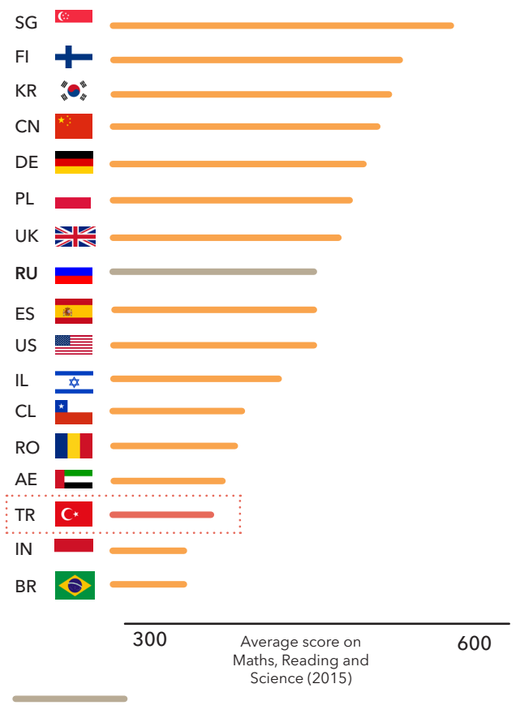
Source: Crunchbase, OC&C analysis

> "As a Council until now we have concentrated our efforts on setting up the regulations to provide capital to startups; yet now it is the time to plan the exit path for these startups in order to complete the a loop and grow the ecosystem." – ***Göktekin Dinçerler, Chairman, TOBB VC/PE Industry Council***

2. Skilled talent

A healthy tech ecosystem relies on a large pool of qualified potential founders and employees with superior skills in technology development and entrepreneurial drive. This, in turn relies on a strong educational foundation in STEM as well as business knowledge. Besides the skills taught in formal education, others must be learned via employment or experience, requiring the private sector's participation to provide training.

FIGURE 12: PISA SCORES (MATHEMATICS, READING, SCIENCE AVERAGE, 2015)



Source: OECD, OC&C analysis

Turkey has a large gap in STEM education while critical thinking, problem solving, and research skills that are part of STEM are the underlying fundamentals that drive innovative cultures and strong tech ecosystems

- Turkey ranks 52nd among 72 countries in PISA scores, lagging behind European Union countries and ranking 35th among 38 OECD countries. STEM education is seen as especially low, and at just 36% of the adult population, high school graduation rates with proper STEM education are less than half of the OECD average of 76 percent.[21]
- A recent study conducted by TUSIAD on "The STEM Need in Turkey for 2023" highlights a 30% gap in the number of employees required in STEM-related functions and those who will have graduated with a STEM degree by the year 2023.[22] Since this projection does not take into account additional human resource requirements needed to build a strong tech entrepreneurship economy, the already large gap is even more significant.
- On a progressive note, the Turkish Ministry of Education has been active in introduction of information technologies to the classroom specifically via the FATIH project.[23] The mission of the program is to provide equal opportunity in education across the nation by leveraging IT, tech tools, and online content to improve teaching quality and reach.
- Furthermore, starting from this year coding has been introduced to the secondary school curriculum. The teaching material makes use of gamification and the content for students and teachers has been developed in partnership with Google.[24]

[21] BBC Türkçe. "OECD eğitim endeksi: Türkiye sondan dördüncü sırada." http://www.bbc.com/turkce/haberler-dunya-37779042 (accessed September 5, 2017)
[22] TUSIAD – PwC. "2023'e Doğru Türkiye'de STEM Gereksinimi" https://www.pwc.com.tr/tr/gundem/dijital/2023e-dogru-turkiyede-stem-gereksinimi.html (accessed September 22, 2017)
[23] Movement of Enhancing Opportunities and Improving Technology (FATIH)
[24] Republic of Turkey, Ministry of National education web site http://www.meb.gov.tr/quotkodlamaquot-dersinin-egitim-materyalleri-hazir/haber/14659/tr

> "Our educational system needs be STEM-oriented. Curriculum improvement at high schools and higher education will yield visible results within five years. Technological subjects such as coding should also be included into the primary education. English language skills are also essential for entrepreneurs who want to scale-up their businesses." - ***Esin Güral Argat – Board Member and Digital Economy Roundtable Leader, TUSIAD***

For entrepreneurship, business skills in addition to STEM skills are required to ensure that innovative businesses can thrive

- Currently, Turkey's c. 200 universities offer enough infrastructure to educate a well number of engineers, and graduates of top schools are highly sought after. The most commonly cited area of development for engineering and science degree holders in Turkey is lack of business acumen which puts them at a disadvantage in the market.
- Particularly lacking are engineering and science related undergraduate programs that include business and/or entrepreneurship courses and joint engineering/business programs.
- At graduate levels, postgraduate entrepreneurship programs could offer both practical and theoretical application of business concepts.
- Outside of the formal education system more specialized schools could develop the talent pool by concentrating on specific skills development such as coding, go-to market skill and business skills.

Recently ten of Turkey's top state universities were reclassified as research universities, which enables them to take a leadership role in advancing the country's innovation agenda[25]

- Research universities can foster both innovation and entrepreneurship, by training researchers on the entrepreneurial mindset.
- While leveraging universities as bedrock of national R&D capabilities, pathways to the private sector must be created or research risks going unnoticed or underutilized, commercially.

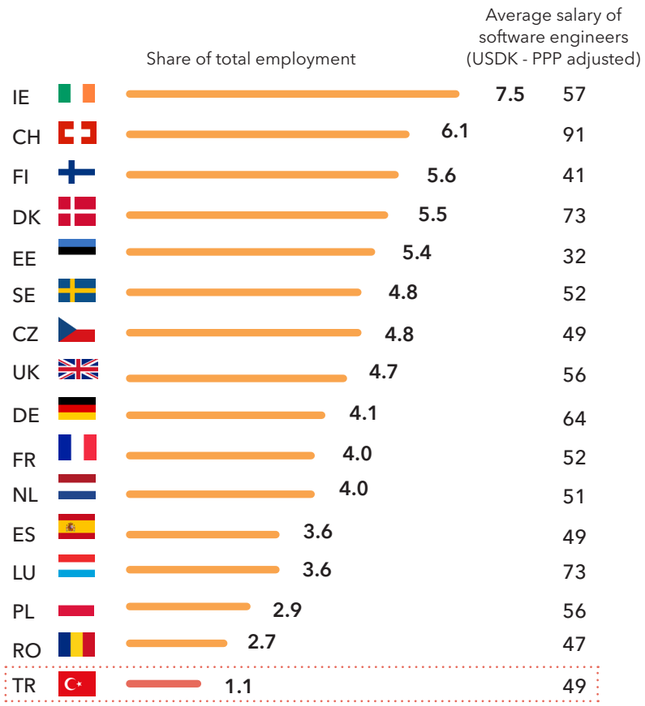
FIGURE 13: THE PUBLIC RESEARCH UNIVERSITIES OF TURKEY

[25] Article in Sozcu newspaper 26 September 2017, http://www.sozcu.com.

High-technology employment in Turkey constitutes a smaller portion of total employment compared to benchmark countries

- One challenge is faced when technologically-savvy and well educated individuals are more attracted to higher paying and "stable" jobs, such as those in the financial services sector – rather than pursuing an entrepreneurial path.
- Another driver of employment in technology and knowledge-intensive sectors would come from prevalence of domestic and global high tech companies that have fully fledged operational presence in Turkey.

FIGURE 14: EMPLOYMENT IN TECHNOLOGY AND KNOWLEDGE-INTENSIVE SECTORS (2016)



Note: Data is shown only for available countries
Source: Eurostat, Startup Genome, Glassdoor, OC&C analysis

Addressing the skills shortage could come from targeted immigration policies and interventions to attract international talent and startups in the region

- By fertilizing the ecosystem with foreign resources, ideas, and skills in the form of immigration, the tech ecosystem can thrive and grow relatively quickly.
  - Turkey's geography lends itself well to this initiative. Connected to both Europe and Asia and with relative political stability and calm, it's well-suited as a haven for entrepreneurs.
  - Countries in the near east, eastern Europe, and the Balkans represent suitable targets for immigration policies tailored to taking the required talent lacking in Turkey.
- The PPP-adjusted average salary of Turkish software engineers might be comparable to the EU contenders; however, attracting skilled talent would mean matching compensations nominally.

"You cannot build the best team by relying only on local talent. Internationally recognized top-tier university graduates should be eligible to apply for Turkish citizenship to be considered as part of the talent pool." - ***Serkan Ünsal, Founder, startups.watch***

Healthy tech entrepreneurship ecosystems feature a dense array of players and structures, with strong relationships between them. This helps entrepreneurs exchange ideas, build teams, get the resources they need to grow.

The network infrastructure of the Turkish ecosystem is represented by Technology Transfer Offices (TTOs), university-led technoparks as well as government labs/facilities, accelerators, and funds.[26,27] Outside of the public sector, privately funded initiatives have revolved around accelerators, co-working spaces, industry events and non-profit organizations that help support tech entrepreneurs.

Endeavor's study of the New York ecosystem found that 33% of top performing startups were three times as likely to have a high-quality mentor compared to startups that experienced regular growth.[28]

> "We don't have a big enough mentor pool for a country of this size. In Singapore, since it is a hub, there are 50+ actors in every stage (co-working space, incubators, angels etc.). We do not have enough people in any of these stages." – ***Rina Onur Şirinoğlu – General Partner, 500 Startups Istanbul***

Young Turkish startups require high-quality mentorship, and the experienced entrepreneurs who are the best candidates for these roles are few in the market

- The best source of these types of mentors are experienced entrepreneurs who have launched, scaled and exited a startup, and are willing to support growth of startups by lending social capital and facilitating deals. While entrepreneurs who have completed an exit tend to remain in Turkey, the low numbers of exits mean the starting pool is relatively small.
- A different source for mentors can be found in successful Turkish entrepreneurs in other countries.
  - Fostering connections between Turkish entrepreneurs in international hubs and the local ecosystem would allow domestic entrepreneurs to gain advice, get incubated overseas, attend international conferences, or secure international funding.

The private sector and independent organizations are fostering a rich environment for entrepreneurship by targeting networking opportunities

- A high number of networking events, conferences, and various gatherings are organized by associations and entities with an interest in the startup ecosystem.
  - Girişimcilik Vakfı (Turkish Entrepreneurship Foundation), selects potential entrepreneurs as "fellows", and supports their introduction into the startup ecosystem with the aim of them starting their own businesses.
  - E-Tohum, a startup accelerator program, organizes the large Startup Istanbul and Startup Turkey to featuring international investors and speakers.

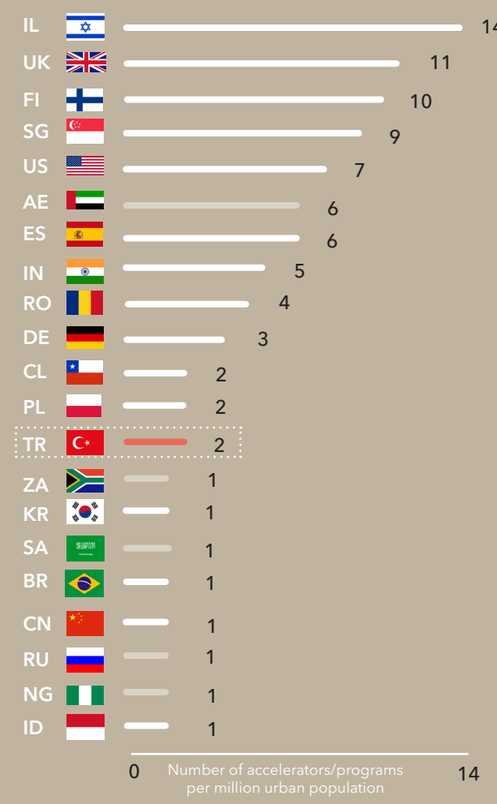
[26] Startups.watch Ecosystem Map
[27] İstanbul Technical University. "Teknopark Nedir?" http://www.ariteknokent.com.tr/tr/nerede/teknopark-nedir (accessed September 28, 2017)
[28] Thaker, Anand. "Get a mentor or go home." Atlanta Tech Village. http://atlantatechvillage.com/buzz/2017/02/08/get-mentor-go-home/ (accessed September 21, 2017)

University- industry collaboration to commercialize innovation is at early stages providing significant opportunities to excel

- Technology transfer offices (TTOs) create the critical linkage between universities and the private sector, helping businesses innovate by leveraging university research, and creating a streamlined pathway to market-ready innovations.
- To emulate international best practices, TUBITAK[29] was commissioned to support the development of TTOs in 2011, with a dedicated program which supports TTOs up to TRY 1 million (USD 273,000) in the first five years.[30] Currently, there are 52 TTOs in Turkey.

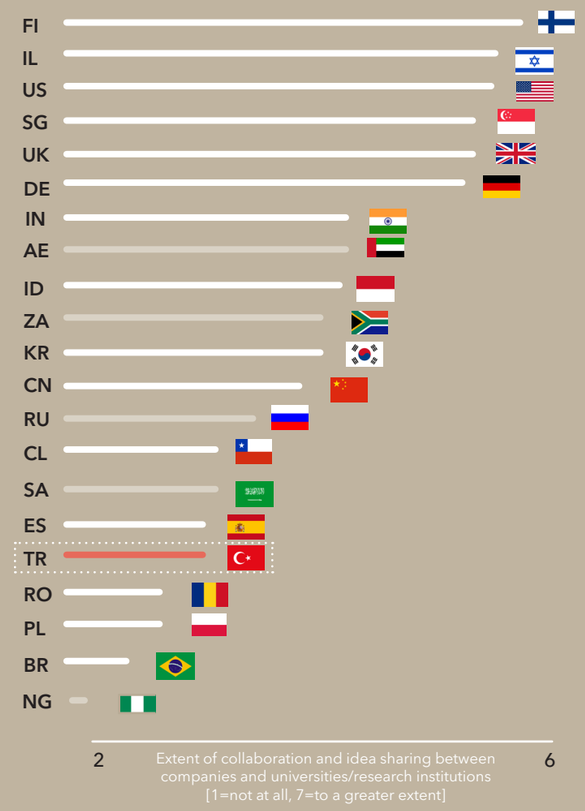
- The ecosystem participants feel that there is still not an established best-practice among tech transfer offices. Most TTOs in Turkey are not integrated across university departments and fall short in assistance with tech transfer methods as well as consulting/advisory capability. Also only a handful has progressed to establish effective connections with industrial enterprises.
- Sources point out that finding the right university and researcher is still an unclear process that's time-consuming for industry players.
- Clear guidance by public authorities and TTO/university management on technology transfer procedures is seen as a requisite to foster healthy collaborations between researchers and startups.

FIGURE 15: ACCELERATOR DENSITY



Source: F6S, OC&C analysis

FIGURE 16: UNIVERSITY/INDUSTRY RESEARCH COLLABORATION



Other countries in scope of tech entrepreneurship study

Source: World Economic Forum Executive Opinion Survey 2016-2017, OC&C analysis

[29] The Scientific and Technological Research Council of Turkey is the leading agency for management, funding and conduct of research in Turkey.
[30] TÜBİTAK. "1513 – Teknoloji Transfer Ofisleri Destekleme Programı.". https://www.tubitak.gov.tr/tr/destekler/sanayi/ulusal-destek-programlari/icerik-1513-teknoloji-transfer-ofisleri-destekleme-programi (accessed September 15, 2017)

FIGURE 17: SPECIALIZATION AND CLEAR RULES OF COLLABORATION ARE PROVING SUCCESSFUL IN INTERNATIONAL TTO

DRAWBACKS OF CURRENT TTO SCHEME IN TURKEY

- The authorities did not built a central coordination mechanism that provides information on TTOs and their area(s) of expertise
- The distribution of IP rights between enterprise and university can lead to disputes between two parties. Clarifications for each possible scenario should be defined in order to minimize confusions and conflicts
- TUBITAK is currently use "number of patents created" as a KPI, which may lead to the registration of impractical patents and create inefficiencies in the model

UK'S CATAPULT: FOCUSED, HARMONIZED, EFFECTIVE

- UK's Catapult model consists of technology transfer centres dedicated to a specific area of expertise such as High Value Manufacturing, Digital, Energy Systems and Future Cities, which are accessible via a single portal
- Clarity in the focuses of each centre allows businesses to target and cooperate with the appropriate centre. This reduces inefficiencies in the network
- Distribution of IP rights under different funding scenarios are described clearly in Catapult in order to manage development, protection and exploitation of new technology
- The government subsidization is around 30%, and the government expects Catapult centres to sustain themselves after a certain maturity
- Since 2011, the centres have supported around 3,000 SMEs, delivered 636 academic collaborations and 2,473 industry collaborations

Source: Fortune Turkey, UK Catapult

Government initiatives have yielded a wide network of technoparks but most are predominantly occupied by larger firms and not by startups

- The first discussions on Turkish technoparks b9 and their numbers of have increased rapidly following the 2001 Law no. 4691 on Technology Development Zones.[31]
- Currently there are 41 active technology parks in Turkey which aim to support innovation and competition between information-based organizations.[32,33] Both large tech corporations and tech startups can benefit from tax exemptions and related R&D expenditure deductions protected under law.
- Many technoparks are mostly occupied by large established companies attracted by the tax incentives, R&D facilities and office campus facilities which technoparks offer. This demand from already established organizations has led to increased rental fees, making technoparks less attractive for startups.
- Another contributor to this trend is said to be technoparks' distance from the city center which makes them less attractive to startups that value convenient access and linkages to potential partners. Startups increasingly gravitate to smaller shared workspaces and office parks in city centers.

> "Between the Levent-Maslak [5 km] subway stations, you can reach 70 percent of your business partners and customers; hence İstanbul is an attractive location for startups and the ecosystem." – ***Yomi Kastro – Founder and CEO, Inveon and Inventures***

[31] Webrazzi. "Türkiye'deki teknokentler hakkında ne biliyorsunuz?" https://webrazzi.com/2016/05/13/turkiyedeki-teknokentler-hakkinda-neler-biliyor-sunuz-tam-liste/ (accessed September 28, 2017)

[32] Startups.watch Ecosystem Map
[33] İstanbul Technical University. "Teknopark Nedir?" http://www.ariteknokent.com.tr/tr/nerede/teknopark-nedir (accessed September 28, 2017)

FIGURE 18: ITU TECHNOPARK IS A GOOD BENCHMARK FOR TURKISH TECHNOPARKS AND OFFERS TAILORED PROGRAMS FOR DIFFERENT STAGES OF ENTREPRENEURSHIP

ITUARI TEKNOKENT

iTÜÇEKirdEK

- Pre-incubation: Access to trainings, mentorship and working space
- Accelerator: Support on go-to-market process (financing, consultancy, networking)
- Big Bang: Establishment of connections between start-ups and investors
- Incubation: Access to advanced consulting, investor meetings and ITU network for successful startups

ITUMAGNET

- Co-working space: A co-working space for late stage entrepreneurs that enable interactions with other entrepreneurs, investors and mentors

INNOGATE

- USA Accelerator: Core market entry trainings focused on the US market
- Turkey Demo Day: Selection of the 8 to10 startups for the next phases
- USA Planning Camp: Scheduling of meetings with potential customers/ investors
- USA Business Develop.: Access to ITU US offices (2 weeks in Chicago, 2 weeks in San Francisco) and meetings for business development
- USA Growth: Support on establishing a business in the US and networking for the startups started working with Growth Partners

Source: Istanbul Technical University

FIGURE 19: NATURALLY FORMING CLUSTERS MAKE IT EASIER FOR ENTREPRENEURS TO BOND AND FORM RELATIONSHIPS

WHY CO-WORKING SPACES?

- Co-working spaces are full of entrepreneurs working on their start-ups with their unique visions. Communication among those people can have an impact on each other's success
- Co-working spaces also offer informal and natural mentorship to start-up
- An entrepreneur sitting on the next table may have an experience on what you are coping with, and his valuable input can be beneficial to your start-up
- These spaces host people from distinct background, hence they enable the collaboration between an engineer and a graphic designer when necessary

KOLEKTIF HOUSE

OFFERS

Working spaces, private desks, private offices and meeting rooms

PARTNER BRANDS

KWORKS, Microsoft, zipcar

INVESTOR NETWORKS

BIC Angels, İş, Galata Business Angels

KOLEKTIF HOUSE

- Kolektif House was founded in 2015 by three young entrepreneurs that were trying to solve their own working space problem
- Founders have studied in Babson College and University of Carnegie Mellon
- Kolektif House is an outcome of deep research involving the best practices of co-working spaces around the world

Source: Milliyet, Kolektif House

4. Culture

Entrepreneurial aspirations range from creating a better life for oneself, financial gain, the glamor of launching a market-leading enterprise to building an alternative to regular employment. Traits such as energy, self-confidence, perception of failure as a learning process, ambition, and independence are key for tech entrepreneurship.

Cultural expectations and perceptions of entrepreneurship guide behavior and how entrepreneurs receive support from the community. They affect when and whether citizens choose to use their skills in entrepreneurial endeavors. Generally in cultures that support entrepreneurial behavior:

- People strive to equalize the distribution of power and wealth in society by taking personal initiative, indicated by low power distance scores.
- There is room for individualism and less of a preference for communal identification and adherence.
- Society at large is more competitive. Achievement, spearheading, assertiveness are celebrated traits and people expect to be rewarded materially for success.
- Lastly, people in entrepreneurial cultures feel less uncomfortable with uncertainty and ambiguity. There is more acceptance of nonconformist behavior and ideas to overcome challenges than to maintain the status quo.

There are some elements in the Turkish culture that shape business culture and discourage entrepreneurial behavior[34]:

- Strong adherence to hierarchical structures where power is centralized and superiors are often inaccessible.
- Turkish businesses prefer to avoid uncertainty by utilizing set rules and regulations. Employees expect clear instructions and tend to operate within well-defined structures.
- The flow of information is selective, open conflicts are avoided, and maintaining proper relationships takes priority over fulfilling tasks.
- Known paths and methods are prized. Pursuit of nonconformist alternatives is discouraged.
- Both competition and compromise are typically avoided in the corporate culture.[35]

Interaction between the corporate sector and entrepreneurs would help set corporate investor expectations of entrepreneurship, and create pathways for collaboration

- By interacting with entrepreneurs in more informal and social settings, corporate executives can observe how entrepreneurs make choices and recover from upsets.
- This could help to align investor and entrepreneur expectations, and increase investor tolerance for failure.

People with established careers are more reluctant to leave behind secure income to pursue entrepreneurship

- The Turkish tech entrepreneur community is mainly made up of young individuals, and up to 98% hold post-secondary degrees. Among high-growth entrepreneurs, 28% have a PhD.[31]
- There are marked differences between normal and high-growth startups, the latter of which are more likely to be founded by older entrepreneurs with more advanced degrees, a much better command of English and other languages, and with some startup experience. Neither the social nor business community is particularly supportive of such transitions.

[34] Geert Hofstede - Cultural Dimensions (www.hofstede-insights.com/models/national-culture/)
[35] Mehmet Cansiz,"Innovative Entrepreneurs of Turkey: The Case of Turkish Technoparks", September 2014, Ministry of Development Publication No:2892

There is a general misconception about what entrepreneurship is, many entrepreneurs have ideas that are not rooted in solid plans or goals

- Professionals in the Turkish ecosystem observe a confusion in the community of what entrepreneurship means in practical terms. Many Turkish youth view entrepreneurship as an alternative, more relaxed and less disciplined work style. Others see it just as an idea pitch process that can bring rapid wealth from early investment based on a proposal.
- Interviewees believed that only a small portion of the younger entrepreneur population has grasped the nature of the requirements and most get discouraged when the reality of entrepreneurship materializes.
- Few Turkish tech entrepreneurs have global ambitions. Little global orientation is evident in the low number of international patent compared to domestic patent applications in the country. Parallel to this trend, Turkish tech entrepreneurs rely on utilizing available technology to create products and services predominantly for the local market. Earlier generation success stories have revolved around adaptations of dominant foreign tech business models.
- The opportunity presented by using Turkey as a test market but thinking globally often goes overlooked. However, B2B solutions in higher tech and science tend to realize the larger potential for their efforts and are more likely to seek cross-border expansion.
- The level of English required for business interactions with international customers and investors remains inadequate, presenting another barrier to effective global expansion.

Presence and celebration of successful national tech entrepreneurs will serve as role models in the ecosystem while re-shaping general cultural beliefs

- Role models fill a critical role in driving society's appreciation for entrepreneurship and inspire highly skilled individuals to become entrepreneurs.
- Wider coverage of successful tech entrepreneurs in public campaigns and mass media builds up the perception of tech entrepreneurship in the national consciousness.

"It is a common mistake among Turkish people to describe themselves as 'entrepreneurs' instead of 'initiative takers'. Initiative takers are impulsive even aggressive and quick in acting, yet these attributes are not necessarily valuable for successful entrepreneurship. Entrepreneurs should be smart, patient, move according to a business plan and take calculated risks."- ***Erhan Erkut, Vice Rector, MEF University***

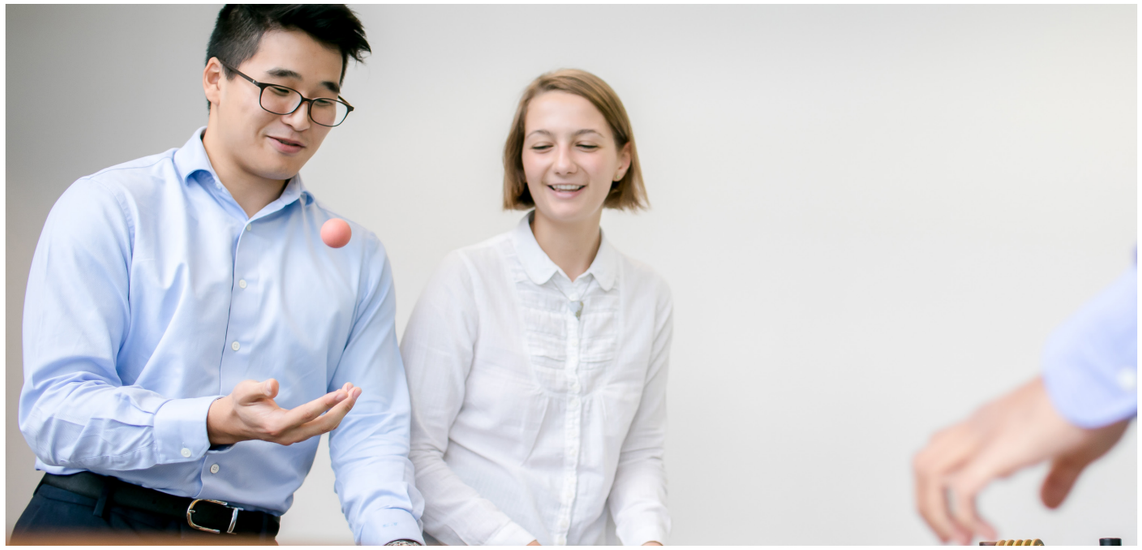
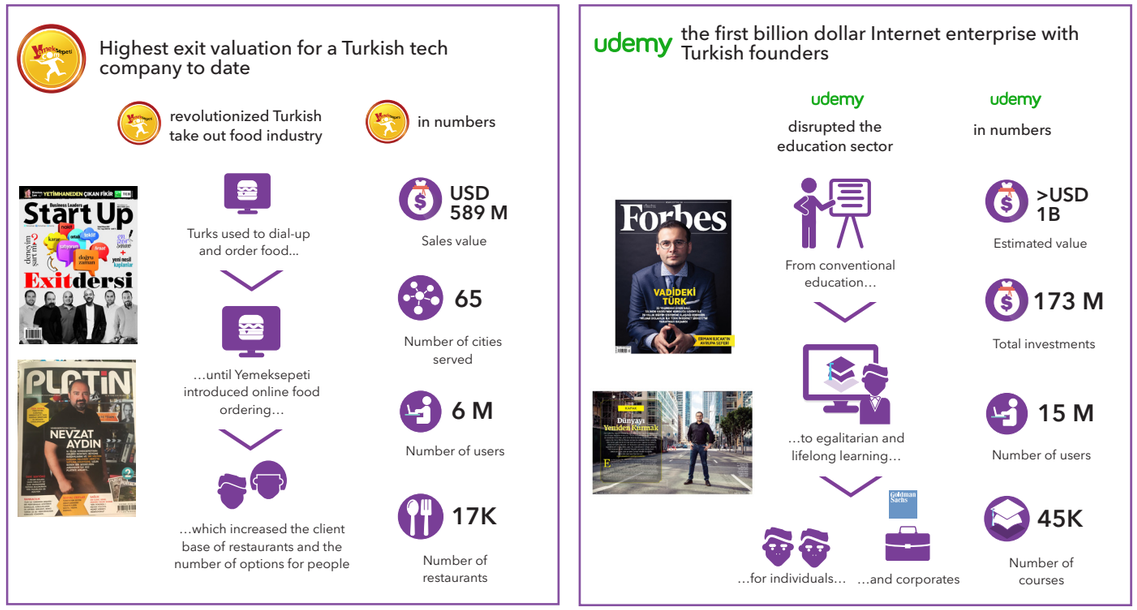


FIGURE 20: SUCCESSFUL TURKISH ENTREPRENEURS - DOMESTIC AND ABROAD - ARE VALUABLE ROLE MODELS FOR THE TURKISH ECOSYSTEM



Source: Forbes Turkiye, April 2017; Yemeksepeti, Techcrunch, Webrazzi

"I have coined the term 'multiplier effect' to illustrate positive impact of entrepreneurship on society. For instance, Yemeksepeti enabled many cooks to get jobs and restaurants to increase their sales. Nevzat [Aydın] also invested back into the ecosystem after his exit." - ***Murat Özyeğin – Board Member, Fiba Group; Leader of Entrepreneurship Roundtable, TUSIAD***

5. Regulations

Tech entrepreneurship is directly and indirectly affected by a broad range of regulations that have an effect on its business construct (Business Procedures), operational domain and boundaries (Digital Policies) and sources of innovation (R&D).

FIGURE 21: NUMBER OF DAYS REQUIRED TO START UP A COMPANY IN EUROPE

Source: Startup Manifesto – Policy Tracker

A. BUSINESS PROCEDURES

The ease of executing business functions drives, in part, how many startups can be launched and survive. Straight forward business procedures help drive interest to take up entrepreneurship. Streamlined, relaxed, and digitalized procedures minimize back office efforts and allow entrepreneurs to accomplish more with limited resources. Tax obligations, both time and cost vise, can affect a startup's growth, especially in the early years when cash flow is uneven.

Regulatory and legislative practices around business, particularly dispute resolution, serve to reassure both startups and their investors of how their rights will be protected as well as any costs of protecting themselves. Bankruptcy legislation is also important, because the legislation can be a significant motivator or deterrent to starting a business.

Turkey's candidacy for the European Union triggered a process that brought the country's business environment in line with many EU countries, and now the country offers a liberal approach to business starts and ownership, which is very entrepreneur-friendly. In 2017 Turkey ranked 60th in terms of ease of doing business and 80th for starting a business at 7 days, compared to the EU's target of 3 days. [36]

> "Selecting the right type of incorporation is hard before company becomes fully operational. In London and Berlin, there are government offices that assist entrepreneurs on how to start up their businesses, it could be helpful if we had the same in Turkey."– ***Melis Abacıoğlu, Founding Partner, SWEATers***

[36] World Bank. "Doing Business June 2017." http://www.doingbusiness.org/rankings (accessed January 24, 2018)

Amendments to the Turkish trade law have enabled smoother procedures for establishing a business

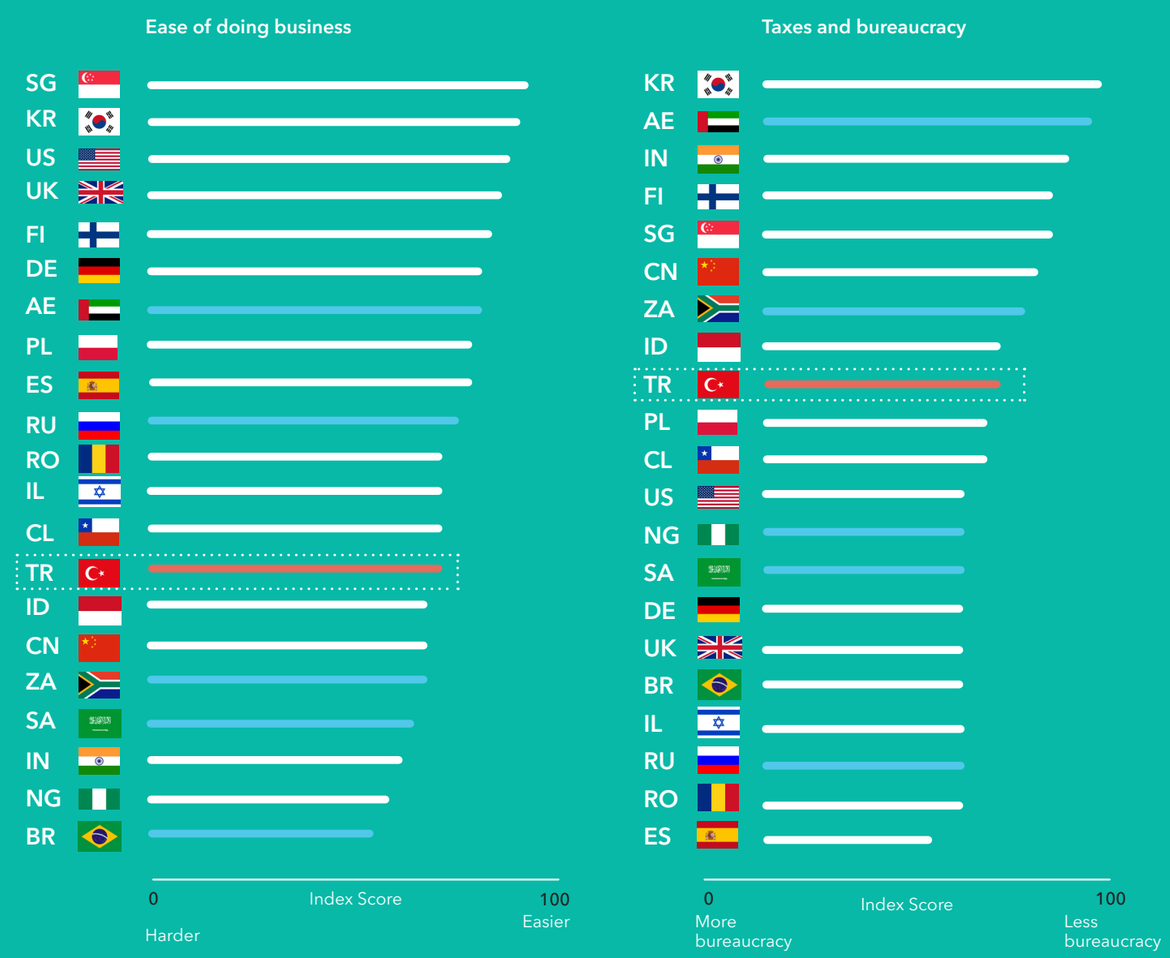
- Recent reforms and digitization efforts have simplified various business procedures in order to stimulate the business environment, though some have yet to fully take effect.
- New reforms enabled individuals to set up "Joint-Stock Company" and "Limited Liability Company" as single owners, and allowed companies to have operations outside of their field of activity.
  - Turkish Commercial Code, which was enacted in 2011, enabled holding Board of Directors and General Assembly meetings online as well as carrying out commercial transactions through electronic signature. Furthermore, General Communiqué No. 397 of the Tax Procedural Law enables Joint-Stock Companies and Limited Liability Companies to keep and present their invoices in electronic format.
- Paid-in capital requirements were also lowered to 25%, compared to 100% before the reforms passed.[37] Some sectors, such as FinTech, require higher paid-in capital, but most ecosystem participants agree this is appropriate given the sensitivity of the sector.
- Regulations regarding foreign investments in Turkey such as Law on Foreign Direct Investment No. 4875 and Law on Encouragement of Investments and Employment and Amendment of Certain Laws No. 5084 welcome foreign investors and protect their rights by providing freedom of investment and equal conditions with local investors.
- While professionals with adequate business experience and familiarity with procedures consider current company establishment procedures straightforward, less experienced individuals feel the need for better guidance.

Compliance with the current regulatory obligations are proving burdensome for early-stage startups

- Social security, VAT, and withholding tax obligations are the most cited concerns, as well as legal fees and bankruptcy procedures. Obligations increase the startups' burn rate and reduce their chances to survive for longer periods.
- Certain measures are being implemented to reduce burden of regulatory obligations:
  - The Turkish Ministry of Trade in its "Entrepreneurship Strategy & Action Plan for 2015-2018"[38] included plans to reduce burdens with grants to entrepreneurs in advance, removing regulatory obstacles, easing liquidation procedures in case of bankruptcy, and giving a second chance to failed entrepreneurs.
  - The Ministry of Finance introduced a tax reduction law for entrepreneurs under 29 years old that allows first-time entrepreneurs to deduct TRY 75,000 (USD 21,000) from their profits before paying taxes for 3 years.[39]

[37] Kızılot, Şükrü. "Tek kişilik anonim ve limited şirket nasıl olacak?" Hürriyet.com. http://www.hurriyet.com.tr/tek-kisilik-anonim-ve-limited-sirket-nasil-olacak-20798677 (accessed September 28, 2017)
[38] Ministry of Science, Technology and Trade. "Türkiye Girişimcilik Stratejisi ve Eylem Planı." http://www.sanayi.gov.tr/DokumanGetHandler.ashx?dokumanId=493ac1cc-1115-4eba-aa7b-771aee977189 (accessed September 7, 2017)
[39] Batur, Cenk. "Genç Girişimciler İçin 29 Yaş Altı Vergi Muafiyeti Kanunu Getirildi". Egirisim.com. https://egirisim.com/2016/08/31/genc-girisimciler-icin-29-yas-alti-vergi-muafiyeti-kanunu-getirildi (accessed September 7, 2017)

FIGURE 22: EASE OF DOING BUSINESS AND GOVERNMENT POLICY: TAXES AND BUREAUCRACY



Other countries in scope of tech entrepreneurship study

Source: World Bank Doing Business, Global Entrepreneurship Monitor, OC&C analysis

FIGURE 23: A CASE EXAMPLE ON THE EFFECTS OF REGULATIONS AND POLICIES ON A TURKISH ENTREPRENEUR

- Armut is an online local services marketplace founded in 2011 that focuses on local services including cleaning, moving and home improvement
- The company had two funding rounds, and raised over USD 4 million from international venture capital funds
- The company has sustainable operations in Turkey, and plans expansion to EMEA region

Information on setting up a company

"My family and friends had no idea on how to establish a legal entity, hence I had to find a lot of resources and talk to accountants and lawyers to get started"

"Choosing the right NACE code for company operations was challenging since there was not a code that exactly matched our operations"

Tax incentives/holidays for startups

"At the time we rented an office with a friend of mine, we were notified that we had to pay withholding tax to the government (c. 20-25% of the rent) even though I was not generating any cash"

Awareness of law enforcement on tech business models

"Only decent and good quality service providers can operate in our model. This created some tension between us and those who don't want to be accountable for their services. Their unlawful allegations against our business model were turned down by the judicial body that was able to see that our practices were benefiting customers"

2011
Armut.com was founded

2014
First round of funding

2016
Second round of funding

2017
150K service providers
70+ employees

Guidance on public grants and incentives

"I established an LLC to apply for brand registration quickly. Two weeks after that I heard about the KOSGEB grants. I failed at applying since the initial grant is given to people who haven't established a company yet"

Investors with a common vision

"It is important to find an investor that can share your vision and provide you with strategic advice, beyond financing the business"

Fair competition standards

"The e-commerce legislation enables consistent tax control and data sharing with Internet businesses. Applying the same practices in offline businesses would enable a fair base for competition and industry growth"

Note: Pear means "Armut" in Turkish, the name of the case company
Source: Interview with Başak Taşpınar Değim (founder of Armut.com), Armut.com, Crunchbase

B. DIGITAL POLICIES

The benefits of the internet economy are enormous but also bring-forth growing concerns around privacy, security, crime, and anticompetitive practices. Striking the right balance between capturing the benefits of the internet while mitigating its potential risks have become a challenge for all policy makers around the world.

Existing Turkish digital policies are generally in line with international standards while implementation challenges may still exist

- Turkey as a general principle formulates its digital regulations in compliance with EU policies and international standards. However, Turkey is the 52nd country among sixty three economies when compared on digital competitiveness. [40]
- Turkish intellectual property (IP) laws have been in line with international IP protection policies, and the law is regularly updated to comply with international standards.
- WIPO's Copyright Treaty has been in force in Turkey since 2008.
- The law recognizes electronic signatures, which speed administrative processes.[41]
- The Information and Communications Technologies Authority (ICTA)[42] has issued a regulation and closely monitors the enforcement of maintaining net neutrality by the internet service providers.[43]
- Cybercrime is treated seriously in Turkey, as a signatory of the anti-cybercrime Budapest Convention, the Turkish Penal Code addresses many digital offenses, resulting in adequate legal enforcement.
- Under the Turkish personal data protection law (KVKK), companies operating in financial services and telecom sectors cannot store customer data outside of the country.
  - Transfer of personal data abroad can be made only if the data subjects explicitly consent to such transfer or if processing of personal data does not require explicit consent because it may be adjusted with one of the exceptions in the legislation, the country that the personal data will be transferred to shall have an adequate level of protection.
  - The regulations are not definitive on the application of KVKK in public activities. Therefore, sector experts indicate that startups working with the public sector refrain from using global cloud services and opt for more expensive and less efficient on premise solutions in order to avoid discontinued operations or fines.[44]
  - Turkish private consumers on the other hand can utilize international cloud services without many restrictions or regulatory barriers
- General observation among ecosystem participants about Turkey's digital policy environment is that while regulations do exist, there are enforcement irregularities.
- It is also argued by the ecosystem participants that arbitrary interventions reduce international confidence and increase perceived country risk, which influence the investment decisions of domestic and international investors into technology entrepreneurship.

Delays in Turkish digital laws enactments refrain entrepreneurs from experimenting in new areas and technologies until the appropriate policy framework is established

- Much anticipated regulation relating to electronic payments, e-commerce and personal privacy and data protection came into effect in 2015 and 2016. (see Figure 25).
- Timely guidance on how regulations will be implemented and enforced is also viewed to be critical to alleviate uncertainties and allow for sound business and investment decisions.

[40] World digital competitiveness yearbook 2017, IMD (https://www.imd.org/.../wcc/...2017/world_digital_competitiveness_yearbook_2017.pdf)
[41] Official Gazette in Turkey. "The Turkish Electronic Signature Law No. 5070." https://www.btk.gov.tr/File/?path=ROOT%2F1%2FDocuments%2FLaw%2FElectronic+Signature+Law+_5070__10_08.pdf (accessed September 5, 2017)
[42] Information and Communication Technologies Authority (BTK)
[43] Global Net Neutrality Coalition. "Net Neutrality." https://www.thisisnetneutrality.org/ (accessed July 20, 2017)
[44] Business Software Alliance. "Global Cloud Computing Scorecard 2016 – Turkey Country Report." http://cloudscorecard.bsa.org/2016/pdf/country_reports/2016_Country_Report_Turkey.pdf (accessed August 9, 2017)

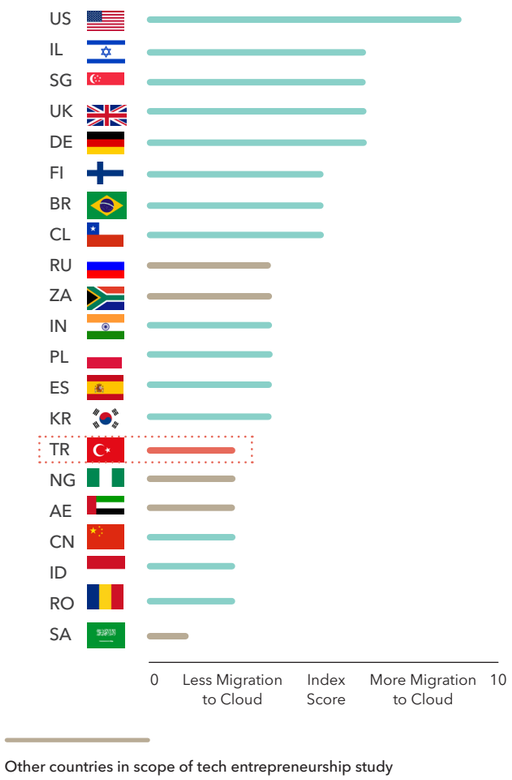
- The ecosystem participants see a benefit in having a specialized body in the government that would stay abreast of all relevant global regulatory developments and initiate timely and synchronized interventions by responsible authorities.

Soliciting the involvement of the tech entrepreneurship community while preparing regulation could help bypass later potential implementation hurdles

- Working closely with the tech entrepreneurship community during the preparation phase of digital regulations is suggested to make sure new laws accommodate startup challenges as well as serve big private sector players.
- Interviewees believe that policymakers should take a constructive approach and weigh the benefits of maintaining an accommodating regulatory framework that harbor major international technology companies in the ecosystem against any protectionist concerns.
- Respondents also stress that policy makers should be cautious in the degree of protective measures since the relatively small size of the Turkish market in the global digital economy may create service providers not at par with international competition.

[48] Ministry of Development. "Onuncu Kalkınma Planı 2014-2018." http://www.kalkinma.gov.tr/Lists/Kalknma%20Planlar/Attachments/12/Onuncu%20Kalk%C4%B1nma%20Plan%C4%B1.pdf (accessed September 6, 2017)

FIGURE 24. CLOUD MIGRATION OF COMPANIES



Note: Cloud migration represents the tendency of migrating traditional IT budgets to cloud platforms, thus measuring demand for public cloud services
Source: Huawei Global Connectivity Index, OC&C analysis

C. GOVERNMENT'S R&D POLICIES

Entrepreneurs are at the forefront of commercialization of innovation. Hence, countries with high public and private R&D activity create more opportunities for entrepreneurship.

Domestic resources allocated to R&D are one percent of the Turkish GDP but showing improvement compared to the 0.86 percent share back in 2011.[35]

The rate of Turkish private sector's contribution to national R&D expenditure increased from 43 percent four years ago to about half the total today, a positive result due to incentives in Technology Development Zones and R&D expenditure relief.[48]

FIGURE 25. RECENT DIGITAL REGULATIONS INTRODUCED BY TURKISH GOVERNMENT [45, 46, 47]

LAW ON PERSONAL DATA PROTECTION (LAW NO. 6698)	REGULATION ON ELECTRONIC COMMERCE (LAW NO. 6563)	REGULATION ON PAYMENT AND SECURITIES SETTLEMENT SYSTEMS, PAYMENT SERVICES AND ELECTRONIC MONEY INSTITUTIONS (LAW NO. 6493)
• Procedures and principles to obtain, store and process personal data • Permission for processing personal data as long as data provider's consent is obtained • Fines up to USD 350,000 in cases of breaches • Introduction of a new Personal Data Protection Authority for law enforcement • Compliance with EU Data Protection Directive 95/46/EC	• Obligations for e-commerce firms to provide clear information on products/services, terms and conditions, data storage and dispute resolution mechanisms • Guidance on commercial communications via electronic communication devices (except e-mails for certain purposes) • Introduction of ETBIS (E-Commerce Information System) to collect certain data from e-commerce firms • Compliance with EU distance selling regulations	• Obligation to deploy data servers in Turkey for banks and financial institutions in order to oversee the monetary operations and protect Turkish consumers • Similarity with EU regulations

Source: Official Gazette in Turkey, T24

[45] Official Gazette in Turkey. "Turkish Law on Protection of Personal Data No. 6698." http://www.kisiselverilerinkorunmasi.org/ingilizce-ceviri/ (accessed August 15, 2017)
[46] Official Gazette in Turkey. "Regulation On Commercial Communication And Electronic Commercial Messages." http://www.resmigazete.gov.tr/eskiler/2015/07/20150715-4.htm (accessed September 20, 2017)
[47] Nebil, Füsun Sarp. "Paypal neden Türkiye'den çekildi?" http://t24.com.tr/yazarlar/fusun-sarp-nebil/paypal-neden-turkiyeden-cekildi,14690 (accessed September 21, 2017)

Government's ambitious R&D goals will create opportunities for the thriving tech entrepreneurship ecosystem

- The Turkish government's long-term vision, as expressed in the National Targets for 2023 – the 100th Anniversary of Turkish Republic – is to bring R&D spending to 3 percent of GDP, in line with the spending rates of frontier countries in tech entrepreneurship, with two thirds conducted by the private sector.
  - R&D spending is planned to be increased by 20% each year according to ICTA's strategic plan.[49]
- Alongside this, the number of full-time researchers is expected to triple to 300 thousand, 60% of which would be private sector employees.[50]
- The government also plans to foster R&D studies with public procurement programs and a focus on innovation and IP rights to promote technology transfer.[52]
- Ministry of Science, Industry and Technology mentions in its report on new projects and goals, that they will be supporting international institutions producing scientific and technological information through Scientific and Technological Research Council of Turkey (TUBITAK) [51]

FIGURE 26: POTENTIAL INDUSTRIES AND AREAS WHERE TURKISH TECH ENTREPRENEURSHIP MIGHT MAKE A DIFFERENCE

KEY INDUSTRIES

GAMING
"Gaming is quite popular worldwide and also in Turkey. Turkish users are among top 5 to 10 most active user rankings of the online gaming applications."
Rina Onur Şirinoğlu – General Partner at 500 Startups Istanbul

FINTECH
"Fintech development is critical for Turkish ecosystem, cause we are already more advanced in consumer banking compared to European countries."
Yomi Kastro – Founder and CEO of Inveon and Inventures

EDUTECH
"Education technologies market is an attractive proposition for Turkey. Massive open online courses such as Coursera and Udemy can enable students to obtain necessary skills to improve the ecosystem."
Hasan Aslanoba – Founding Chairman of Aslanoba Capital

AUTOMOTIVE
"Some of the global automotive firms produce all or most of their trucks in Turkey. It may make sense to set up a industry-specific incubator or accelerator in such cases, which may lead to a regional innovation hub."
Erhan Erkut – Vice Rector at MEF University

AGRICULTURE
"Focusing on optimization in agriculture is more valuable than creating a local version of a successful e-commerce model. Doktar and Tarla.io are good examples of agribusiness start-ups."
Erhan Erkut – Vice Rector at MEF University

KEY AREAS

IoT
"IoT is an area that lack global champions, so we can still be successful at a global scale by taking the right actions. The key issue here is to develop solutions to increase the battery life of smart devices."
Ata Uzunhasan – Managing Director at Galata Business Angels

SMART CITIES
"High-speed internet connection can lead to creation of new solutions to public challenges in big cities"
Serkan Ünsal – Founder of startups.watch

Source: Interviews

[49] Information and Communication Technologies Authority (BTK) Strategic Plan 2016-2018 (https://www.btk.gov.tr/File/?path=ROOT%2f1%2fDocuments%2fSayfalar%2fStratejik_Plan%2fStr_Pln_2016-2018.pdf)
[50] TUBITAK. "Ulusal Yenilik Sistemi 2023 Yılı Hedefleri." https://www.tubitak.gov.tr/sites/default/files/btyk29_web_2.pdf (accessed September 20, 2017)
[51] Turkish Industrial Strategy 2015- 2018, Ministry of Science, Industry and Technology
[52] Verginet. "Ar-Ge Faaliyetlerine Yönelik Mevzuatımızdaki Destek ve Teşvikler ile Kurumsal Ar-Ge Teşvikleri.". http://www.verginet.net/dtt/1/ar-ge-tesvik-mevzuat.aspx (accessed September 7, 2017)

Partnerships between the private sector and tech entrepreneurs to solve innovation challenges is not a well-established practice in the Turkish ecosystem

- The government's support to private sector R&D activities has helped companies build strong in-house capabilities.
- Companies that are qualified as "R&D centers" by the ministry benefit from some tax exemptions. In 2016, the government increased the number of eligible private R&D centers by reducing the required number of researchers from 30 FTEs to 15.
- In addition, TUBITAK has various support programs for SMEs and large corporations that are conducting R&D studies.[53]
- Interview participants observe that incentives offered to established corporation have led to a reclusive R&D culture within the private sector.
- Entrepreneurs argue that there is little motivation for private sector companies to involve tech entrepreneurs in sourcing or partnering for innovation.
- They believe the government can facilitate a private sector/ entrepreneur partnership culture with special provisions for open innovation and corporate cooperation with tech startups.

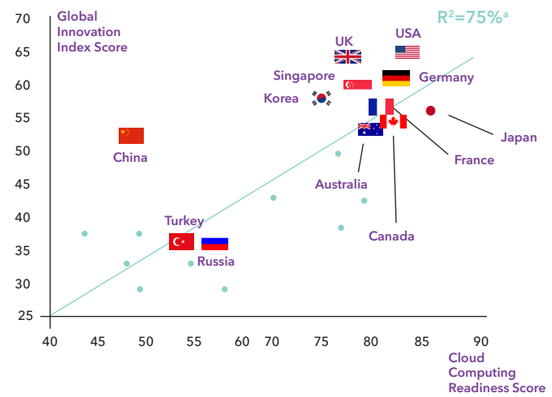
"We should draw lessons from advanced countries on how to go about developing an innovative nation, strong knowledge base. Israel, made it a national policy to attract R&D facilities of global companies to set up in their country which paid off in creation of a knowledge base economy." - ***Ata Uzunhasan, Managing Director, Galata Business Angels Network***

Wide penetration of high-speed internet at affordable prices promotes the ability of the ecosystem to support rapid knowledge sharing and dissemination of new technologies to the wider population. It also indicates the ability of the wider market to consume tech-enabled products and services.

Cloud services allow businesses, especially tech startups, to lower their capital expenditure and IT cost structure by providing hardware, infrastructure, software, and application requirements as a service instead of capital investments, increasing their business agility and operational resilience.[53] Moreover, studies indicate that increased access and usage of cloud computing services positively correlates with the level of innovativeness of a country.

FIGURE 27: CLOUD COMPUTING PLAYS AN IMPORTANT ROLE CULTIVATING INNOVATION

CLOUD COMPUTING – INNOVATION RELATIONSHIP

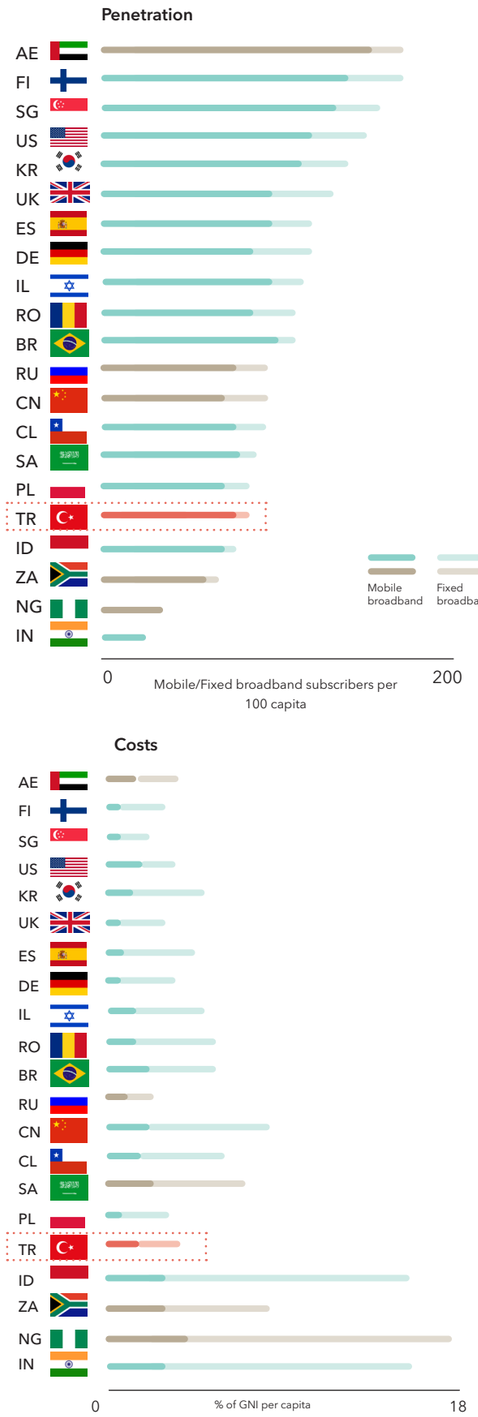


a. Excluding China
Source: Business Software Alliance, INSEAD Global Innovation Index, OC&C analysis

[53] Pepper, Robert; Garrity, John; LaSalle, Connie. "WEF The Global Information Technology Report 2016 – Cross-Border Data Flows, Digital Innovation, and Economic Growth." https://www.weforum.org/reports/the-global-information-technology-report-2016 (accessed September 4, 2017)

The ICT infrastructure in Turkey is still developing, but already has enough coverage and accessibility to effectively support the existing tech entrepreneurship ecosystem.

FIGURE 28: MOBILE/FIXED BROADBAND PENETRATION AND COSTS



Source: International Telecommunications Union, OC&C analysis

The Ministry of Development has set targets for ICT development in Turkey under the "Information Community 2015-2018 Strategy and Action Plan" and as already surpassed its estimations for some of the key indicators.

FIGURE 29: MINISTRY OF DEVELOPMENT 2018 ICT DEVELOPMENT TARGETS VS. 2016 ACTUALS

	2016 Actual	2018 Target
Internet usage ratio (% population in last 3 months	58	75
Households with broadband Internet access (% households)	73	75
Mobile broadband subscribers (% population)	65	70
Fiber Internet subscribers (millions)	2	4
LTE subscribers (millions)	19	10
IT industry size (USD B)	31	23
IT industry exports (USD B)	1	2

Source: Informatics Industry Association, Information and Communication Technologies Authority, Eurostat, Ministry of Development

Turkey's mobile and internet infrastructure is effective for existing startups

- The mobile and internet infrastructure is sufficient for tech startups to innovate, launch businesses and grow.
- Most interviewees highlighted the ongoing improvement of both internet penetration and cost for consumers as the main positive support mechanism for the ecosystem.

Upgrading to widespread fiber broadband networks is viewed as a potential game-changer for the ecosystem

- Turkey's broadband services are currently accessible but still have room for improvement, ranking 36th out of 182 countries for fixed broadband fees according to ITU.[54]
- Access to broadband has a high impact on growth. A 10 percent increase in broadband access is estimated to result in a 1.38 percentage point increase in GDP growth in developing countries.[55]
- Many Turkish ecosystem participants believe that providing extensive and affordable fiber broadband is essential to create the kind of technology based businesses that successfully attract foreign entrepreneurs to the ecosystem.
- Affordable fiber broadband is cited as the single biggest enabler of equal access to quality education and health services across the country.

> "We should expand our fiber network so that everyone can get high-speed connection, which should be considered as the highway investments of an innovative society. This high-speed environment can lead to creation of new solutions to public challenges in big cities."
> ***- Serkan Ünsal, Founder, startups.watch***

Data is a critical resource for many businesses as the global economy has increasingly became digitalized. Ability to keep data secure while having real time access to it in the most cost efficient manner gives competitive advantage to businesses of all sizes. Free cross-border data flows especially benefit tech entrepreneurs who can take advantage of global service providers' economies of scale and minimize their operation and transaction costs. Hence, easy access to cloud services allow for more tech entrepreneurs participate in the economy.

Increased use of cloud services for business necessitates high speed internet connection at low costs

- One physical hurdle in effective use of cloud services is the asymmetric internet connections that allow much faster downloads than upload speeds.[56] Increasing of Internet quotas at affordable prices by wider penetration of fiber broadband internet discussed earlier could be the way forward to address this bottleneck.
- Corporates use of international cloud services is mainly dependent on reliability ensuring effective and continuous operations which is possible with high speed internet connection at low cost. Additionally, the open access nature of cloud services demands security guidance and other practices to increase confidence in cloud computing.

[54] International Telecommunications Union. "Measuring the Information Society 2016." https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2016/MISR2016-w4.pdf (accessed September 22, 2017)
[55] Zhen-Wei Qiang, Christine; Rossotto, Carlo M. and Kimura, Kaoru. "Information and communications for development: Extending reach and increasing impact – Economic impacts of broadband." World Bank, https://openknowledge.worldbank.org/handle/10986/2636 (accessed September 20, 2017)

[56] Sinan Ugurlu PhD, system and infrastructure expert, "Cloud Computing in Turkey", 15 November 2016 https://tr.linkedin.com/pulse/t%C3%BCrkiyede-bulut-bili%C5%9Fim-suat-u%C4%9Furlu

7. Market potential

The addressable market size for tech startups in a country is a function of the national economy, digital literacy and readiness of customer groups and consumer habits affected by internet/mobile coverage as well as the propensity to try new products and services. Other factors such as access to corporate customers and internationalization opportunities define startups' growth opportunities.

The government can impact the size of the market with increased fast speed access, consumer protection and competition rules, by building public confidence in online services, and especially directly via procurement programs and policies.

Turkey's digital economy has grown at a rapid pace in recent years, due to Turkish customers' willingness to adopt new technologies. For instance, the e-commerce market has experienced 31 percent growth in 2015, followed by 24 percent in 2016, to USD 10.2 billion (TRY 30.8 billion).

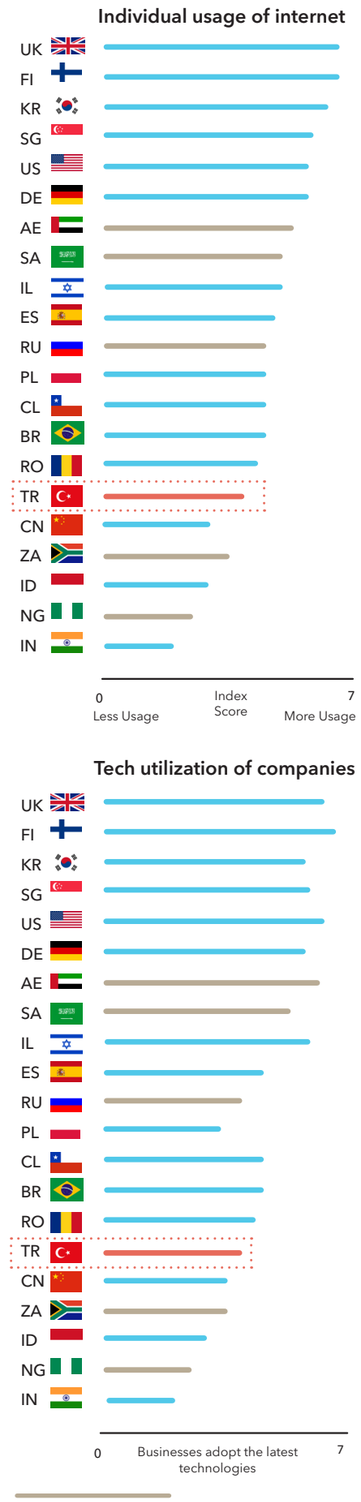
Fintech sector, which is predominantly focused on B2B and B2C payments, mobile banking, asset management and capital markets is estimated to be USD 15 billion in size growing about 14 percent per year.[57] The SaaS sector accounted for USD 4 billion (TRY 11.9 billion) last year, software exports growing more than 20 percent annually to reach USD 676 million.[58]

High broadband subscription and credit card penetration rates suggest that there is a considerable consumer business potential in the domestic market [59]

- Online retailing constitutes 3.5 percent of total retailing, showing significant room for growth considering UK and the US levels which are greater than 10 percent.

[57] "Turkey's Fintech Ecosystem", Deloitte, 2017 www2.deloitte.com/tr/tr/pages/about-deloitte/articles/turkiye-fintech-sekto-ru-umut-veriyor.html (accessed December 25, 2017)
[58] TUBISAD,"Bilgi ve İletişim Teknolojileri Sektörü 2016 Pazar Verileri", 11May 2017

FIGURE 30: INDIVIDUAL USAGE OF INTERNET AND TECHNOLOGY UTILIZATION OF COMPANIES



Note: Individual usage measures Mobile telephone subscriptions, Internet users, Households with a personal computer, Households with internet access, Fixed broadband internet subscriptions, Mobile broadband internet subscriptions, and Use of virtual social networks
Source: WEF The Global Information Technology Report WEF The Global Competitiveness Report, OC&C analysis

- 17 percent of the Turkish population made an online purchase in 2016, this rate is 55 percent in EU, further highlighting the potential for growth.

FIGURE 31: DIGITAL ECONOMY DRIVERS, 2016

Large, young, dynamic population	Total population 80 M	15-35 population 26 M
Highly connected	Broadband subscription 59 M	
Significant online shoppers with substantial growth opportunity	Number of Internet shoppers 14 M	
High smartphone penetration with further improvement potential	Smartphone users 35 M	
One of the highest mobile shopper ratio across the globe	Mobile shopper value share 19%	
One of the highest credit card penetration across the globe	Credit card base 59 M	

Source: Euromonitor, Statista, ITU, OECD, IMF

> "Turkey is a mid-sized market; therefore businesses cannot reach scale by only focusing on a single product/service without going abroad. This forces them to offer multiple products / service lines, and they become 'jack of all trades, but master of none'. Consequently, these firms cannot build competitive advantage in the global arena. We should convince ourselves and our startups to scale our single product/service in the world markets, rather than focusing solely on our home base." – ***Deniz Tunçalp, Program Director, ITU ARI Teknokent***

[59] TÜBİSAD. "Türkiye'de E-Ticaret." http://www.tubisad.org.tr/Tr/News/Sayfalar/TUBISAD-e-Ticaret-pazar-verileri16.aspx (accessed October 5, 2017)

Using Turkey as a test bed is an opportunity for startups to use a strong domestic market as a springboard to global expansion

- Despite its large population, Turkey's domestic market is not big enough to grow global champions and create unicorns. Ecosystem participants indicate that given disposable income levels and online shopping penetration the addressable market for digital commerce is about 30 million people in Turkey. This is a sufficient size to carry local-only offerings (such as business model adaptations) to success such as India or China.
- Turkey's market size is ideal for validating business models, and testing products. Turkish entrepreneurs are advised to focus on flexible business models that can accommodate national differences and to make scaling plans that include globalization.
- B2B startups have an especially high potential, given the more standardized nature of business needs.

The government can be a critical source of continuous demand for tech entrepreneurs

- Many interviewees believe that public procurement programs are one of the most effective ways for governments to support entrepreneurs, providing them with sizable business contracts that strengthen their ability to do business with the private sector.

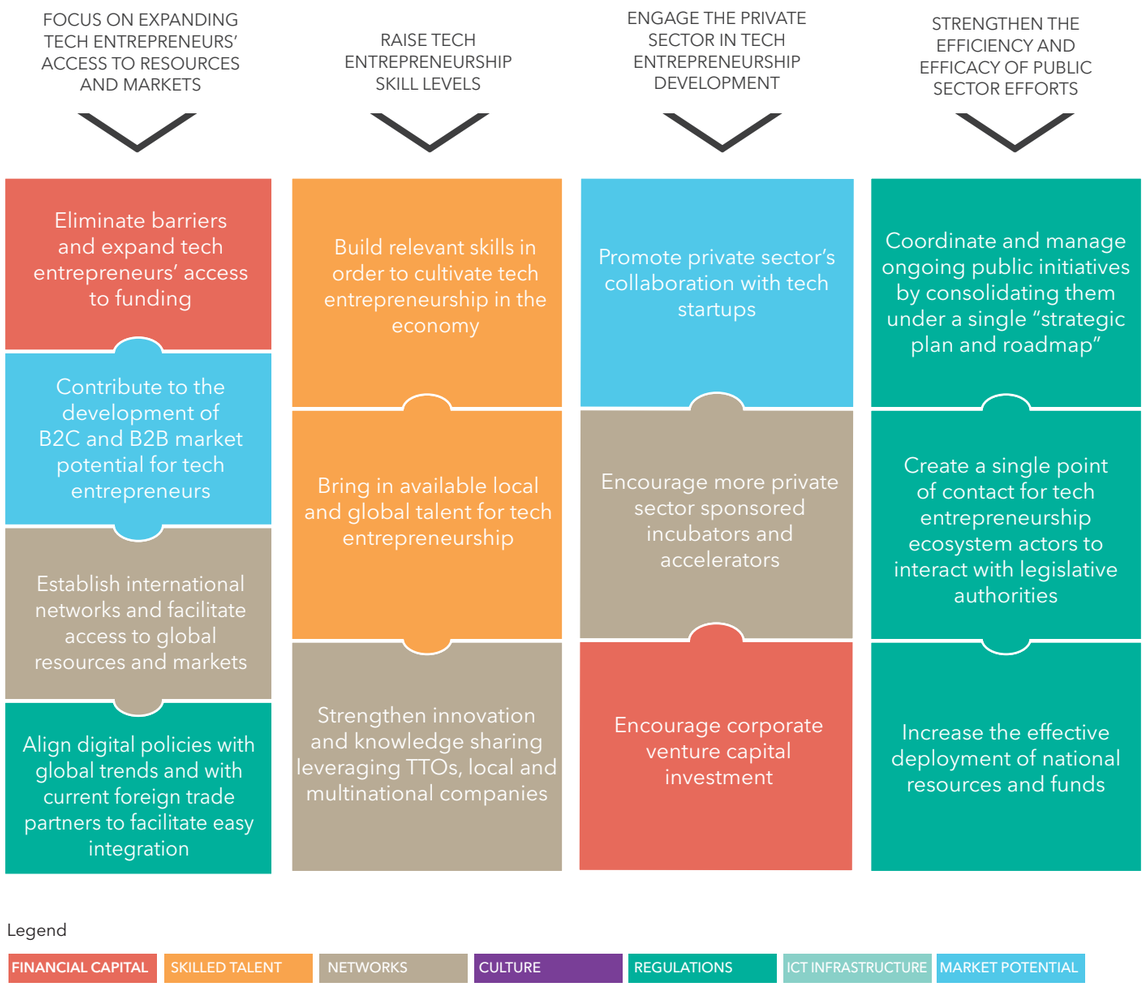
Attractive government support programs fostering internationalization of Turkish companies could be modified to include tech startups

- The Turkish government has been a systematic supporter of Turkish manufacturers' export efforts to help them become global brands with the "Turquality" program, and broadening this initiative could serve to widen access of tech startups to the wider market.

Recommendations designed to strengthen the tech entrepreneurship ecosystem

Insights into the Turkish tech entrepreneurship ecosystem have led to the articulation of a series of policy recommendations that could be considered to address gaps and foster a strong ecosystem. These recommendations can be grouped under four main headings:

FIGURE 32. POLICY RECOMMENDATIONS DESIGNED TO STRENGTHEN THE TURKISH TECH ENTREPRENEURSHIP ECOSYSTEM



Focus on expanding tech entrepreneurs' access to resources and markets

Eliminate barriers and expand tech entrepreneurs' access to funding

A report by Startup Genome found that it takes about two decades for a tech entrepreneurship ecosystem to mature, if it is aggressively supported by adequate investment capital and government/private sector interventions. Given such requirements, the government's immediate focus should be on mobilizing the domestic investment potential for tech entrepreneurship effectively and efficiently with the aim of creating success stories that will motivate the community and attract global attention and support.

Boosting domestic sources of equity by **matching private institutional and individual investors is a role that the government can play.** It can empower them through a mix of matching investments, providing subsidies for expenses, and providing tax deductions.

Tech entrepreneurs struggle most with the expense reimbursement feature of existing grant programs. In an effort **to align with tech entrepreneurship's development needs, adapting payment up front rather than the expense reimbursement method would provide cash-poor startups with valuable funding.** Continuing with this focus, specific grants can be awarded in lump sum amounts or in tranches for tech entrepreneurs who qualify. As a result, wider tech entrepreneur initiatives may take root and get in under the private early-stage funding radar.

In order **to increase the effectiveness of angel investments in Turkey, the accreditation process could be made leaner to entice more investors.** The importance of membership of business angel networks could be amplified by matching such networks' investments with public funds. This could create opportunities for reaching more entrepreneurs and spreading angel funds risk over a wider investment pool. Streamlining the investment approval process would complete the circle of improvement in business angels' equity funding.

The Turkish government is currently in the process of passing a new law which will put in place a legal framework for governing crowdfunding in Turkey. The government could **use the introduction of such a crowdfunding law to promote tech entrepreneurship's importance to Turkish economy and publicize it to a wider audience**, building awareness and a supportive culture for entrepreneurship as a viable source of employment for the young generation.

Contribute to the development of B2C and B2B market potential for tech entrepreneurs

Turkish consumers are quick to adopt new technologies, so increasing digital literacy and providing affordable high-speed internet is a key catalyst for growing the size of the domestic market for digital businesses. **Providing high-speed internet services at very affordable rates, or even free of charge in public areas and in remote provinces** could further increase usage and promote online services.

These initiatives, coupled with **public awareness campaigns on proper technology use, could alleviate concerns and limit the spread of misinformation.** Transitioning public services delivery to the internet, and continuously improving service quality would also signal to the wider population that the government is an active participant in digital platforms.

Public procurement programs are one of the most effective ways which governments support the tech entrepreneurship ecosystem. Young startups achieve operational sustainability years ahead of schedule when the public sector becomes a key customer. Doing this effectively requires streamlined procurement processes and prompt payment practices. Communication of government tenders suitable for tech startups on a central portal might serve transparency and achieve greater traction.

Establish international networks and facilitate access to global resources and markets

Accessing foreign markets, understanding how to operate in more advanced ecosystems, establishing contacts with international mentors, and presenting to reputable international VCs are seen as bottlenecks for the global expansion of Turkish startups. Active Turkish expats residing in more advanced tech entrepreneurship ecosystems would provide a source of expertise for policy design and create gateways for Turkish startups to get exposure to advanced markets. Nonresident Turkish tech entrepreneurs are great role models for the domestic ecosystem. Funneling their expertise back to the Turkish ecosystem can bridge the gap in mentoring needs.

The government can task public agencies such as "Invest in Turkey" to **engage in outreach initiatives such as an international accelerator programs coupled with roadshows that allow select high- potential tech entrepreneurs to build the skills needed to expand globally**. This would provide them with assistance in navigating bureaucracy and create an audience of international investors.

Align digital policies with global trends and with current foreign trade partners to facilitate easy integration

If **properly aligned with international standards, digital regulations can support tech startups. A government regulation council could amplify these efforts while supporting the timely development of and adjustments to the Turkish regulatory framework.** This council could also interact with a wide range of tech entrepreneurship stakeholders to incorporate their views and make a cost/ benefit assessment of the whole ecosystem. Ultimately, the benefit of such a body would be that it could provide the government with a well-rounded perspective, allowing it to develop a national stance in sync with international best practices.

Raise tech entrepreneurship skill levels

Build relevant skills in order to cultivate tech entrepreneurship in the economy

To remain relevant and competitive in the digitalized global economy, Turkey must recalibrate its education policies to ensure the economic relevance of its labor force in the future. **Strengthening a STEM-related curriculum in schools is the best way to expand the proportion of qualified human capital within the national workforce.**

Including coding as a mandatory subject in primary and secondary school education will familiarize students with the skills required in tech entrepreneurship, provide opportunities to experiment, and build interest in digital professions. Prerequisites for the successful implementation of this initiative will be **developing computer-literate teaching staff in school systems, and providing free or cheap access to computers and the internet to the younger generation.**

Post-secondary options that can strengthen software development capabilities **include increasing the number of high-quality vocational schools that offer coding to accommodate the market need for coding skills and provide access to skill building opportunities outside of the university system.** By including technical universities, tech companies, established business executives and representatives of entrepreneurship ecosystem, the Ministry of Education can take the lead in designing an upgraded vocation program to match government ambitions.

At the university level, **internships at entrepreneurial companies could be accepted to comply with the compulsory requirements of engineering programs.** Such internships would allow interested students to get exposure to tech entrepreneurship while they are studying. **Universities could also include entrepreneurship as a minor undergraduate degree, in partnership with management and engineering faculties.** Such degrees could be open to students from different disciplines, creating an environment for collaboration. Project-based classes would allow students to develop tech initiatives into business propositions.

At the postgraduate level, **multidisciplinary entrepreneurship Master's programs could be created by leading state and privately funded foundation universities.** These programs could resemble an extended, intensive accelerator program, and enrolment into these programs could be based on the entrepreneurial traits of applicants as well as academic excellence. A spillover effect of these initiatives could be online seminars and e-learning programs prepared by the universities to disseminate knowledge to a wider student body and beyond.

Bring in available local and global talent for tech entrepreneurship

Foreign talent could fill the gap in existing needs for tech entrepreneurship mentors until successful entrepreneurs in the local ecosystem increase in numbers. Turkey's climate and geography make it an attractive location for highly mobile foreigners with technology skills. Favorable immigration policies with a specific sub-sector focus might also entice international investors.

The Turkish government can accelerate the number of tech entrepreneurship by designing preferential visa programs for international talent with specific qualifications and abilities. "Start-up Chile", "French Tech Ticket" and Singapore's "EntrePass" are some examples of programs initiated by governments to attract international tech entrepreneurs to boost their local ecosystems. **Easing access to work and residential permits for high-value skilled foreign labor** would also help growing local tech companies attain experience and know-how.

The highly skilled talent in the corporate world is an untapped resource that would be a valuable addition to the startup ecosystem. **Enticing well compensated corporate professionals to take up entrepreneurship roles with tax incentives could promote a career change and make entrepreneurship more attractive.** Recent changes in Turkish commercial law have enabled stock options in Turkey, which is a valuable first step. Introducing favorable tax regulations could enable practical use of this incentive.

Strengthen innovation and knowledge sharing leveraging TTOs, local and multinational companies

University TTOs could become centers of excellence in specific fields that match the institution's knowledge and academic strength, while supporting the business community and economic activities in their catchment areas. They would promote knowledge accumulation and in-depth expertise, targeted services, motivate stronger IP management practices and industry networks, and provide coordination for the tech entrepreneur community, leading to a reduction of inefficiencies in the system.

R&D initiatives designed to encourage open-source innovation could motivate the private sector to reach out to tech entrepreneurs as a source of innovation and serve to promote private sector/ entrepreneur partnerships.

Success in **cultivating a productive tech entrepreneurship ecosystem also relies heavily on big technology corporations and innovative companies** that serve the community in multiple ways.[5]

Their initial role as an employer provides training opportunities for the nation's workforce. Employees get exposure to and experience in using and commercializing technology as well as developing management skills. Secondly, these companies serve as a source of new-tech entrepreneurs, as some of the experienced employees who identify market opportunities leave to start up their own ventures. Thirdly, they become customers of tech entrepreneurs' goods and services. Lastly, large technology companies often engage in outreach activities to promote the use of tech in surrounding communities. They offer training programs to promising new startup candidates, collaborate with universities to promote technology, and sponsor joint programs. International corporations also run structured training programs for entrepreneurs, which they launch in the countries that they operate in.

Given these benefits the **government can take deliberate steps and provide the necessary conditions to encourage international tech companies to set up fully fledged operations in Turkey.**

Engage the private sector in tech entrepreneurship development

Healthy ecosystems benefit from private sector support. The Turkish government's efforts to facilitate private sector involvement could therefore create the foundation of a sustainable ecosystem.

Promote private sector's collaboration with tech startups

The government can **promote private sector actions in collaboration with tech entrepreneurs by promoting open innovation in government-industry interactions, and incentivizing corporations to allocate parts of their sourcing activity to entrepreneurs.** By emphasizing IP protection, as well as good working capital management practices that favor tech entrepreneurs, startups can be helped to thrive in these relationships.

Establishing a new Top 100 ranking category in private sector/entrepreneurship collaboration could help promote good practice in the industry while it can also be used to identify recipients of government support.

Encourage more private sector sponsored incubators and accelerators

The **need for a larger number of high-quality incubators and accelerators can be fulfilled by programs designed and run by private corporations,** which can encourage their experienced professionals to act as mentors, provide access to resources, and leverage existing customer relationships. Run independently or as partnerships with university accelerator programs, private sector companies can contribute coaching and resource access as well as funding support.

The benefits of this initiative would serve both sides. It would help speed up development processes, enabling tech entrepreneurs to foster early business relations. At the same time, private corporations would gain from early exposure to innovations in their sector – or new business processes – and thus ignite corporate entrepreneurship practices within their organizations.

Making initial running expenses deductible from corporate income taxes would be a strong incentive for private sector incubators. Rating agencies could track program performance, which would justify eligibility for further public support and signal program attractiveness to the ecosystem.

Encourage corporate venture capital investment

Corporates must upgrade and diversify their business portfolios to stay relevant and defend against nimble competitors. This is a natural catalyst for establishing venture capital funds, which help corporates explore the innovation in their sector while supporting tech startups.

Corporates that want to participate have two options: corporate venture capital funds targeting preselected geographies or sectors or direct investments into tech startups based on ad-hoc opportunities. The latter creates a strategic relationship with the entrepreneurial team and allows a streamlined investment process, and fewer restrictions and obligations.

In any form, **encouraging large enterprises to engage in venture capital activities by wholly or partially matching their commitments from a public 'fund of funds' could increase the capital invested in the Turkish tech ecosystem.** This initiative could also help the transition of investment management to the private sector, where competitive dynamics would benefit the overall ecosystem.

Strengthen the efficiency and efficacy of public sector efforts

Coordinate and manage ongoing public initiatives by consolidating them under a single "strategic plan and roadmap"

Various government bodies have developed separate initiatives, strategic plans and supportive regulations to cultivate technology, innovation, and entrepreneurship for different stakeholders. However, many interventions cut across ministerial jurisdictions so joint involvement would be desirable to design comprehensive development initiatives.

The current challenge is to **create an interface between plans and programs by different policymaking authorities and lay out a concise overarching national strategy and roadmap.** The "Information Society Strategy and Action Plan (2015 -2018) and the Turkish Entrepreneurship Strategy and Action Plan (2015 - 2018) are particularly important, and these can serve as a comprehensive set of initiatives for ecosystem development. These plans could provide the foundation for a national roadmap for a long-term vision.

In Singapore, the Economic Development Board[59] serves as **a coordinating body that oversees the entire tech entrepreneurship ecosystem.** A similar body in Turkey could manage the government's ambitions by executing and monitoring activities related to fostering high-impact entrepreneurship.

Create a single point of contact for tech entrepreneurship ecosystem actors to interact with legislative authorities

A single point of contact in the form of an office with the authority to interact with both public and private ecosystem stakeholders could enhance the effectiveness and timeliness of public policy interventions. Moreover, it would create a market information channel that would enable government bodies to remain attuned to developments in the tech entrepreneurship ecosystem and assess policy effectiveness.

The center could disseminate information on policies, incentives, and programs, and a portal could become the go-to address for entrepreneurship enquiries. The Turkish government has been able to generate best practices in this area, such as the establishment of the investment support and promotion agency "Invest in Turkey".

Increase the effective deployment of national resources and funds

A lack of coordination between strategy, policy, and execution capacity contributes to suboptimal utilization of available public resources by the tech entrepreneurship community. A transitional solution could be **bringing together the technocrats in public offices with expert academics and active and experienced entrepreneurs to detail procedures and application protocols that best utilize allocated resources.** Going further, the deployment of funds and resources could be entrusted to quasi-government or private institutions with clear objectives, performance targets, and periodic effectiveness analyses.

The odds of success in tech endeavors might be increased by **prioritizing support to new-tech clusters that already exist or several tech sub-segments that fit well with existing strong, globally competitive business sectors in Turkey.** Leveraging the well-developed R&D infrastructure, those who are responsible for public policy can create and strengthen tech clusters that serve a strategic purpose. **R&D incentives could be synchronized to increase the commercial application of research activities in strategic fields. Facilitating university-industry collaboration throughout research processes could further increase the market readiness of research efforts.** In this way sub-sectors could be selected, supported, resourced, and prepared to lead the transformation to a knowledge-based society.

Lastly, to expedite natural selection and success, **the government – in collaboration with tech entrepreneurship ecosystem experts – might engage in a focused and customized assistance initiative for a select number of high-potential tech entrepreneurs** every year to help them overcome their next set of challenges.

Conclusion

Turkey's geography, culture, population, and economic growth make it well positioned to capture the wealth creation and economic diversity that a knowledge economy provides. While tech entrepreneurship has been on the public sector agenda for some time, new interventions designed to make the many efforts more effective and finding overlooked areas of opportunity are important.

Government reforms have taken place across the board, addressing many weaknesses in the ecosystem. These have been successful in addressing some pain points, but have fallen short in terms of achieving full impact due to the limited interaction between – and contribution by – the private sector and ecosystem participants.

With adjustments designed to make public incentives more effective, encouragement of private sector participation, the introduction of entrepreneurship in schools, and a special focus on improving STEM skills and business acumen, the tech ecosystem is poised to grow in line with the government's ambitions.

Acknowledgments

We are grateful to Google for the invitation to write this paper. We wish to acknowledge and express our appreciation to our collaborator the Girişimcilik Vakfı, particularly Mehru Öztürk Aygül, the General Manager of the Foundation and Elif Ulun, our project coordinator for their contributions and support throughout this project.

We also wish to thank all the participants in our interviews for their contributions and valuable insights. All of the interviews were conducted in Turkish, all quotes have been approved by their owners as presented. The usual disclaimer applies.

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Yomi Kastro – Founder and CEO, Inveon and Inventures

Zafer Elcik – Co-founder, Otsimo

Appendix

Definitions – Tech entrepreneurship frame of reference

For the purposes of this paper, entrepreneurs are distinguished from self-employed individuals by their motivation to create a rapidly scalable business venture with the aim of innovating, improving, or transforming the given way of doing things.[3,5]

The entrepreneurship domain includes startup and scale-up phases of the business cycle where companies are experiencing high growth in revenues and employees numbers while validating their value proposition and building up.

Technology-driven entrepreneurship bases its business proposition on the use of new technologies as an enabler and focuses on hyperconnectivity among of networks, people, businesses, things, and hardware that's internet-enabled. Technological applications in conventional sectors and new businesses in emerging sectors fall under its definition.

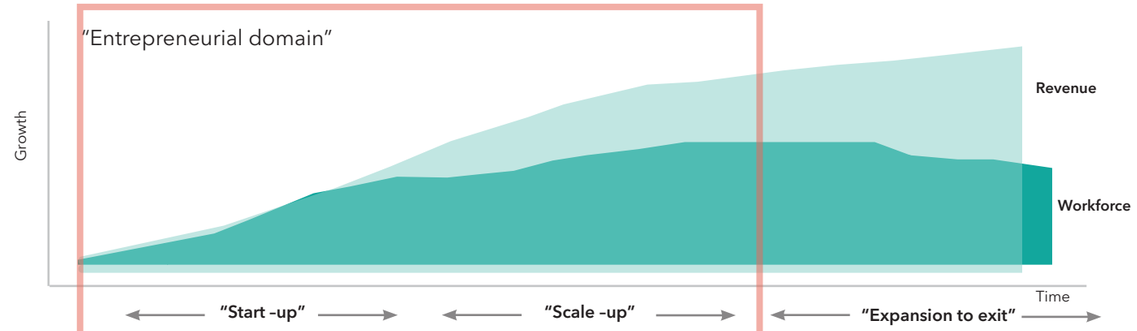
agents of change who create **new value propositions** by means of new products, services, innovative processes, and organizational innovations that lead to evolution or obsolescence of current way of things

business owners **who seek to generate value,** through the creation or expansion of economic activity, **by identifying and exploiting new** products, processes or markets

… different from self-employed individuals who seek to generate income by using **existing** products, processes or markets

initiators whose **business ventures result in the development, growth and well-being** of their societies through **job creation** and **level of innovation**[2]

FIGURE I. THE MAIN INDICATOR OF AN ENTREPRENEURIAL ENTERPRISE IS ACHIEVING YEAR-ON-YEAR HIGH GROWTH IN REVENUES OR EMPLOYEE BASE



ATTRIBUTES	"Start -up"	"Scale -up"	"Expansion to exit"
Entrepreneur's motive	• **to create a business** by introducing **an innovation** to the way a product or service is designed, produced, delivered or performs that is preferred over existing alternatives	• **to scale up** the business to address a wider customer base and to repeat it in different markets	• **to expand and capture** greater share of wallet and grow market share with new products / services • to grow along the value chain or customer experience
Entrepreneur's role	• **organizing, managing, and assuming the risks** of an enterprise to generate commercial benefit out of the innovative idea • validating value proposition, setting strategic direction • engaging external resources	• **improving the value proposition** through employment of technological advancements or introduction of new goods, services and processes utilizing these advancements	• **continuing the entrepreneurial activity** within the corporate by utilizing organizational resources to carry out innovative activities
Business goal	• **establishing product** – market fit • **achieving fast ramp up** (at least 20% annually) by establishing a new value proposition • **attracting professionals** to build skills and capabilities • **bringing in** seed and initial rounds of **equity investment**	• **sustaining high growth** – at least 20% CAGR[1] and generating profits • **scaling up workforce** and building an effective organization • **strengthening equity base** by additional venture funding • **raising capital** by using financial leverage	• **increasing profitability** while maintaining growth • **achieving operational excellence** and organizational efficiency • **growing inorganically** • **optimizing debt** to equity levels • **preparing for** initial or secondary **public offering**

[1] High-growth Enterprises and Gazelles –Sensitivity Analysis, Ditte Rude Petersen and Nadim Ahmad, OECD 2007
Source: Global Entrepreneurship Monitor (GEM) Global Report 2016/17, Global Entrepreneurship Research Association 2017

FIGURE II. "TECHNOLOGY ENTREPRENEURSHIP" CAN BE DISTINGUISHED FROM OTHER FORMS OF ENTREPRENEURIAL ACTIVITY

Mostly **new technology** is used to transform **an innovative idea to a scalable and repeatable** business proposition – i.e. web, mobile,

Business is based on **hyperconnectivity** : web of networks, people, businesses, things, machines, and computers **enabling intelligent operations using advanced data analytics to redefine the landscape** for individuals and businesses

TECH ENTREPRENEURSHIP UNIVERSE

EMERGING SECTORS

- On Demand
- Big Data / Data & Analytics
- Virtual / Augmented Reality
- Gaming
- Internet of Things (IoT)
- Smart Home
- Cybersecurity
- Blockchain
- Robotics and drones

TECHNOLOGICAL APPLICATION IN CONVENTIONAL SECTORS

- e-Commerce
- Marketplace, Classifieds
- AdTech
- AgTech
- AutoTech
- CleanTech
- EdTech
- FinTech
- HealthTech
- Real Estate Tech
- RegTech
- Space Tech
- Marketing Tech (Loyalty apps)
- Transportation
- Travel & Tourism Tech

Definitions- Tech entrepreneurship success outputs

Output	Indicator	Definition	Source	Date
Economic Contribution	Tech start up prevalence in the country[1]	Number of active tech start-ups founded after 2010 per million urban population	Crunchbase	2017
	Tech startup longevity	Survival rate of tech startups that were founded after 2010	Crunchbase	2017
	Number of exits over USD 100m	Number of acquisitions and IPOs between 2012-2016 that had a valuation over USD 100 million	Crunchbase	2017
	Entrepreneur's growth aspiration score	A scoring based on percentage of entrepreneurs with a sophisticated growth strategy aspiring to grow at least 50% in the next 5 years and attract VC funding	GEDI	2016
	High job creation expectation	Percentage of those involved in Total Entrepreneurial Activity[2] who expect to create 6 or more jobs in 5 years	GEM	2016
	Ability to create globally recognized "Unicorns"[3]	Number of unicorns is used an indicator of global reach since they operate beyond their local markets and are highly international and large in scale	CB Insights	2017
	Contribution of knowledge sectors to economy	An index to approximate the value of global flows that are linked to knowledge economy: • ICT exports[4], • high tech exports[5], • international data flow connections • intellectual property receipts of a country (excluding domestic receipts)	World Bank, McKinsey, INSEAD	2015, 2016
Innovation Creation	Innovative output density	An index on the abundance of knowledge creation (patents, publications etc.) and intangible assets (density of trademark applications, industrial designs, creation enabled by ICT)	INSEAD	2016
	Entrepreneurial innovation creation	Percentage of those involved in entrepreneurial activity who indicates that their product or service is new to at least some customers AND that few/no businesses offer the same product	GEM	2016

1. The urban population of China and India were normalized using the city populations of tech entrepreneurship activity
2. Total Early-Stage Entrepreneurial Activity measures the percentage of working age population (18-64) both about to set up their businesses and have set up at most 42 months ago
3. Unicorns are startup companies that are valued over USD 1 billion
4. ICT service exports include computer and communication services and information services including computer data transactions
5. High tech exports are R&D-intensive products, which can be found in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery

Disclaimer

This report was prepared independently by OC&C Strategy Consultants in collaboration with Girişimcilik Vakfı who have both been commissioned by Google to research the tech entrepreneurship ecosystem in Turkey (in addition to other developing countries in Eastern Europe, Middle East, Africa region) to identify policy recommendations to improve tech entrepreneurship. Information provided herein, including policy recommendations are prepared and intended for use as discussion materials on the ways to support the growth of tech entrepreneurship.

The report is based on a variety of inputs from multiple sources including official data sources such as various public institutes and foundations focusing on entrepreneurship, and other privately published data sources such as news articles, sector reports and interviews with tech entrepreneurship ecosystem actors. Recommendations are based on statements of ecosystem actors. Accuracy of analysis and recommendations are dependent on the detail and accuracy of declared data. Parties do not guarantee and are not responsible for the currency, propriety, accuracy or reasonableness of any statements, information or conclusions contained in the source documentation used.

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