Tech entrepreneurship ecosystem in the United Arab Emirates

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OC&C Strategy consultants

wamda

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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 towards 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 United Arab Emirates (UAE), as part of a six- country study that includes the Turkey, Russian Federation, South Africa, Nigeria 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, grouping them into nine components. Some of these components explain the strength of the ecosystem that supports tech entrepreneurship, while others point 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. 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.

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 the UAE can use to assess their status, identify improvement areas, and apply approaches that fit the nature of their own ecosystems.

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

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

In the final stage of the study, we conducted extensive primary research in the UAE 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 impact by conducting bespoke research with ecosystem participants, together with Wamda, tech ecosystem, fund and platform. The policy recommendations that are part of this report are suggestions from the UAE entrepreneurial community for further policy initiatives that will help strengthen the development of the tech entrepreneurship ecosystem in the UAE.

In total, we interviewed 19 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. *Tech entrepreneurship ecosystem strength and results achieved feed each other for greater success*

Tech entrepreneurship ecosystem: Describes the inputs necessary to cultivate thriving tech entrepreneurship

Financial capital:
- Grants/subsidies
- Individual investors: Crowdfunding, Angel investors, Personal networks
- Venture capital
- Public funding
- Corporate investment (CVCs & M&A)
- Securities market
- Debt financing

Skilled Talent:
- Educational foundations
- Skills development: schools, courses, programs, on the job training
- R&D and innovative skills
- Attracting local talent to tech entrepreneurship
- Acquiring international talent

Networks:
- Mentors and coaches
- Accelerators / incubators
- Diaspora networks
- International linkages
- Events
- University-industry partnership
- Tech transfer offices
- Physical clusters: Co-working spaces, Technoparks

Culture:
- Society's attitude to entrepreneurship
- Entrepreneurial aspirations and appetite
- Promotion of role models / success stories
- Media coverage of entrepreneurship

Regulations:
- Ease of doing business
- Compliance
- Trading across borders
- Digital policies
- Government R&D policies

ICT Infrastructure:
- Accessibility and affordability of Internet (mobile / fixed)
- Cloud & data center experience

Market Potential
- Digital literacy / readiness: individual use, cloud migration, digitization of gov't services
- Domestic market size: B2B, B2C, Public procurement
- Local market efficiency
- Internationalization

Results of tech entrepreneurship: Indicates the outputs generated by tech entrepreneurship

Economic Contribution:
- Size of tech e-ship: Revenue, Number of startups, Share in GDP
- Workforce employed in tech entrepreneurship
- Growth rate: Revenue, Number
- Value creation: Market cap, Unicorns
- Global reach: Share of int'l revenues, Number of int'l operations

Innovation Creation:
- Innovation created by tech entrepreneurs: Number of innovative products, process, business models introduced in the country in a given year

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 environment needed to generate successful tech entrepreneurship.

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). Developed 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.

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 a culture of innovation.

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, amongst other factors. 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 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.

5. Mason, Collin and Brown, Ross. "Entrepreneurial Ecosystems and Growth Oriented Entrepreneurship." OECD-LEED. http://www.oecd.org/cfe/leed/entrepreneurial-ecosystems.pdf (accessed October 2, 2017)

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 to entry for business startups.

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.[4] Governments have played a leading role in successfully facilitating tech entrepreneurship ecosystems through their impact on all seven components of the ecosystem.

Executive summary

> The country scores relatively highly on a number of indicators, making it a rising star in tech entrepreneurship, poised to become a global frontrunner.

UAE at a glance

The UAE – the MENA region's third-largest country by population – is a constitutional federation of c. 10 million people with a GDP of 349 billion. The income per capita (PPP) of USD 68,092 makes the country one of the wealthiest in the world, where all but 15% of the workforce are guest workers. Although it has the seventh-largest oil reserves worldwide, the country has invested to shift its economy from oil dependence to other sources of government revenue, which now make up c. 70% of GDP. Heavily dependent on 85% expat workers, the UAE's workforce are mainly drawn to the country for employment at multinationals and large established local entities. A liberal business environment permits 100% foreign ownership in the country's 45 free zones and SMEs contribute 30% to the economy. Supporting this is the government's USD 82 billion Science, Technology and Innovation Higher Policy amongst several other initiatives designed to promote innovation. Some of the world's largest investment funds and large-scale innovation projects point to the country's capability for long-term innovation, including Abu Dhabi's Masdar City, tech entrepreneurship classes at the universities, driving public-private partnerships, and refining the regulatory infrastructure to make it as attractive as possible to private sector development, investors, and skilled capital.

Results of tech entrepreneurship – Outputs

Across the UAE, the strength of government commitments to innovation has yielded both a high startup density as well as a rich network of support services and foundational programs to drive long-term innovation. The country scores relatively highly on a number of indicators, making it a rising star in tech entrepreneurship, poised to become a global frontrunner. The UAE is responsible for nearly 40 percent of the region's top exits. E-commerce play Souq.com's acquisition by Amazon for USD 600 million set the record for the region.

Innovation capability is still under development, but investments in R&D projects at the public and private sector levels, and a sustained focus on STEM, both within universities and as part of innovation projects, are likely to yield results in the long term. The output performance comparison of UAE against the benchmark set can be found on page 23.

The UAE tech entrepreneurship ecosystem overview – Inputs

The UAE benefits from an extraordinarily high commitment by government and independent programs to support the tech ecosystem. Youth entrepreneurship is a key focus designed to stimulate citizen participation in the private sector and create high-quality jobs in the knowledge economy. This is especially important, given that 94% of citizens are employed by the public sector. A 'CEO of Innovation' role exists across different government sectors, but no central authority oversees the country's innovation efforts. Key initiatives targeted include the USD 270 million

Khalifa Fund, as well as the Dubai Future Foundation and Dubai Future Accelerators, which were set up to drive the Dubai government's future agenda.

Current UAE startups are mainly in E-commerce, marketplaces, and infrastructure/software as a service (69 percent of total startups). Most UAE startups (52 percent) are B2C ventures, and 93 percent of all startups are located in Dubai.

In our review and field research of the pain points of the tech entrepreneurship ecosystem in the UAE, three key areas were identified:

- Business setup and first-year operating costs for tech startups are some of the highest globally, although the low-tax nature of the ecosystem means that ongoing costs are lower than in other places.
- The UAE ecosystem is remarkably active and highly resourced, yet the early-stage nature of the regulatory framework means that some gains will only be achieved over time.
- The market potential of tech startups is shaped by their ability to go cross-border to other Gulf and non-Gulf MENA countries, given diverse cross-border requirements and the small market size of the UAE.

1. Financial capital

The UAE is home to some of the world's largest funds and wealthiest individuals. The country potentially has as much as USD 1 trillion in available investment capital, yet the formal investment structure of angel groups and venture capital funds is still evolving as the ecosystem matures. Funding that went into UAE tech companies grew 10x in just two years, to USD 1 billion in 2016, and 2017 has been a record year for exits. A growing number of angel networks are joining family offices, formal VC funds, and holding companies to invest into tech companies.

Tech funding will be accelerated amid continuing interest from abroad and more exits. Most local and international investors have preferred to invest in tech companies registered outside the UAE, given the nature of dispute resolution and share class provisions. However, new jurisdictions such as Abu Dhabi's Global Markets (ADGM), which mirrors the English common law found in offshore havens such as the Cayman Islands, is designed to attract UAE company registrations and reassure investors of the appropriateness of the legal framework for tech investment.

Later-stage rounds are more difficult to secure than earlier ones, with larger startups often seeking funding in other ecosystems such as Silicon Valley when they resemble market leaders in their categories or can demonstrate their international market potential. Logistics startup Fetchr's USD 11 million funding round in Silicon Valley is one example of this.

The large number of high-net-worth or family office Limited Partners (LPs) are increasingly bypassing VC funds to invest directly into tech companies, affecting a traditionally strong source of investment in venture capital funds. In many cases, the VC firm is retained for selected services, such as deal flow and transaction advisory.

Exit paths have only started to emerge in the young UAE ecosystem, although 2017 has been a record year with Souq.com's sale to Amazon for c. USD 600 m, and the acquisitions of E-commerce sites JadoPado and Namshi.

2. Skilled Talent

The UAE's unique draw for highly skilled workers has created a talent pool well suited to business-oriented roles and young tech companies. At the educational level, STEM skills are still under development, with continued improvements predicted based on initiatives that are underway, and these are likely to drive Emiratis into knowledge-based roles in the future.

The UAE has been successful in attracting global brands in education, and the country is now home to campuses from New York University, Paris-Sorbonne, Harvard Medical School, and business schools INSEAD, London Business School, and Hult. This helps drive good foundational education as well as entrepreneurship skills.

The government has invested heavily in embedding entrepreneurship in school programs and is now targeting tech skills across the Arab world. A variety of initiatives range from an annual hackathon at prestigious university NYUAD, a program to train 1 million coders across the Arab world, and mandatory entrepreneurship courses at the university level, designed by Stanford University faculty. All these are aimed at raising the level of tech and business skills in the UAE, but these initiatives will take time to impact the job market and achieve the government's performance goals.

Egypt and Jordan are key markets for tech companies to outsource tech talent from, given the relatively high costs of employment within the UAE at the early stages of a tech company. These markets provide a sizable pool of talent at a favorable cost, without the administrative effort of managing immigration into the UAE.

The UAE's attractiveness as a hub for big business has meant it is home to a large number of professionals with strong business skills, many of whom have aspirations of entrepreneurship. Sectors such as energy, real estate, finance, professional services, media, and retail benefit from skilled executives with strong sector knowledge

3. Networks

Strong commitment by the UAE government to entrepreneurship and innovation has yielded a high number of initiatives, funds, programs, and accelerators aimed at supporting tech entrepreneurs, although no central authority oversees this activity. Global brands such as Egypt's Flat6 Labs, the US's Techstars and 1776 accelerators, and global social innovation hub Impact Hub in addition to local accelerators such as in5 and Astrolabs benefit from sponsorship or proximity to large tech companies such as IBM, Google, and Microsoft.

University programs in the UAE have scanned the globe to build networks for their tech entrepreneurship programs, pulling global mentors or teams for accelerators, and retaining international faculty to design entrepreneurship programs.

Some of the programs that operate in the UAE are uniquely forward-looking. The Dubai Future Foundation, Area 2071, and the Mars Scientific City are projects that target long term achievements over decades or even generations.

The diversity of programs, coupled with a strategic focus on development of the local population, mean that local and expat entrepreneurs are largely served by a distinct sets of programs. This may lead to missed opportunities for knowledge sharing that would come from more blended teams.

4. Culture

The UAE's long history as a trading port and cosmopolitan meeting point has meant that there is an entrenched culture of entrepreneurship in the country, although Emirati culture is more reserved and places a high value on following social norms. Among the immigrant population that makes up the bulk of the private sector workforce, ecosystem participants report a high respect for tech entrepreneurship. The ambitious real estate, art, architectural, and technological projects staged by the country are reflected in the highly ambitious attitude of the private sector workforce. But while most in the tech entrepreneurship ecosystem embrace the experimentation required of innovation, the larger business community can be failure averse.

The open and tolerant rules of the UAE, and particularly Dubai, make it highly attractive to talent from the MENA region and beyond. Ethnic and religious minorities are free and protected, which is a big draw for many from the MENA region, while the weather and lifestyle make it attractive to Westerners.

The visa system means that most entrepreneurs are more mature and established rather than young and experimental, favoring business ideas that reflect experience over disruptive innovation.

5. Regulations

The UAE is a relatively young country, and the regulatory framework is continually evolving to fit the needs of the existing and projected business environment. This is also true of legislation relating to tech entrepreneurship and often means that regulatory changes are put in place quickly but require time to take effect.

Business procedures

The requirement to rent office space, in addition to setup costs related to the trade license and employment visas, means that some young companies need as much as USD 25,000 for their first year of deterring some from starting companies. The administrative process required to obtain visas means that company growth may be affected, which in turn could impact their job creation potential.

Trade license requirements for young companies call for a finalized view of business activities, which may be difficult for young startups that are still proving their business model, or young companies whose activities combine different business elements. The introduction of new free zones that mirror jurisdictions such as the British Virgin Islands represents a significant opportunity to attract young tech companies looking for cheaper alternatives to international offshore jurisdictions to the UAE.

A recent addition of 5 percent VAT to all sales in the GCC (starting with the UAE and Saudi Arabia) may introduce financial discipline and pave the way for standardized financial reporting.

Digital policies

Overall, the UAE has strong IP and cybersecurity laws that create the necessary protections for safe use of the Internet. Rules on freedom of speech and content are not seen as restrictive, but just appropriate to the business context. Voice Over Internet Protocol (VOIP) remains one area of restricted services that is unique, given security concerns. Challenges accessing these services has meant that startups are unable to use this low-cost communication method. For startups that operate internationally or rely on international customers, this can raise the operating costs significantly.

Government R&D policies

The UAE government is planning to triple its R&D spending in the six years leading up to 2021, through universities and by using public-private partnerships as a key mechanism to maximize impact. Existing projects have featured large-scale R&D centers at universities funded, in part, by the country's sovereign wealth funds as well as R&D centers within the country's many free zones.

Trading across borders

The framework for a Customs Union for the GCC is in place and operates as a common external tariff that is assessed only once goods have entered the union. However, ecosystem participants report that differences in how the tariff is handled administratively means complexity for some startups operating across borders.

6. ICT Infrastructure

The UAE's ICT coverage is among the best in the world, however broadband internet data plans are some of the most expensive in the Gulf region, often related to the duopolistic nature of the UAE's telecom sector. Cost efficient VOIP and VPNs alternatives are out of reach for tech companies due to local licensing requirements. The government follows through with its commitment to a strong ICT infrastructure and good coverage with large-scale projects such as providing broadband to Abu Dhabi public schools or providing free WiFi in public spaces across Dubai.

7. Market Potential

The UAE's unique demographics and socioeconomics make it an ideal consumer market for some sectors such as the luxury market, where UAE residents purchase more than USD 8 billion in goods annually. Apps and services that rely on smartphone use are helped by the extraordinarily high Internet use and smartphone penetration in the country; 92% and 81%, respectively.

The relatively small population of the country (c. 10m), means that to achieve scale-up stage most UAE tech companies must go cross-border, typically into Saudi Arabia and/or Egypt. Most of this expansion happens following successful funding rounds, and most of the country's largest scale-ups operate in up to 13 countries.

The region may look homogenous to an outsider, but the the cultural and dialectical differences in MENA mean that companies going cross-border must have dedicated market entry plans to ensure local partnerships are sound and marketing plans strike the right tone. The UAE's position as a hub for finance, media, content, tourism/hospitality, natural resources, and technology has created a number of specializations that signify market and talent access advantages for local and international startups. Projects such as Marriott's TestBED accelerator represent some of the B2B and partnership opportunities the UAE offers.

Recommendations designed to strengthen the tech entrepreneurship ecosystem

Most of the challenges faced by the UAE tech entrepreneurship ecosystem require addressing the foundation that tech entrepreneurship ecosystems rest upon. Ensuring that government targets for innovation development are achieved is likely to depend on maintaining focus on the regulatory infrastructure and educational foundations, already are a top priority. Accordingly, the UAE will need to continue aligning its digital policies with frontier nations in order to become a viable partner and supplier.

However, many challenges currently being addressed will only improve in the long term. In the interim, adopting a focused and targeted approach to relieving current tension points at the heart of the tech entrepreneurship activity could provide early success stories and working models that can be replicated across the country. The pressing recommendations to address gaps and foster a strong ecosystem based on interview insights are grouped under four three main headings:

(Details of the recommendations can be found on page 53.)

Financial capital | Skilled Talent | Networks | Regulations | Market Potential

Ease setup requirements and reduce operating costs

Develop a general-purpose Innovation Trade Lincense that allows tech companies to experiment while they finalize their business model

Create exemptions from the office space requirement that allow startups to operate for a defined period

Partner with incubators and accelerators to distribute free trade licenses and other public resources

Continue developing a regulatory structure that's conducive to tech entrepreneurship and operations

Ensure the new entrepreneurship visas are aligned with the unique needs of young companies and global talent

Create a Ministry of Innovation that unifies innovation and tech entrepreneurship efforts across ministries and emirates

Maintain focus on and publicize transparency in court cases in new jurisdictions to attract foreign investors and reassure local ones of the strength of the regulatory framework

Lead the creation of an entrepreneurship association that liaises between young tech companies and the goverment

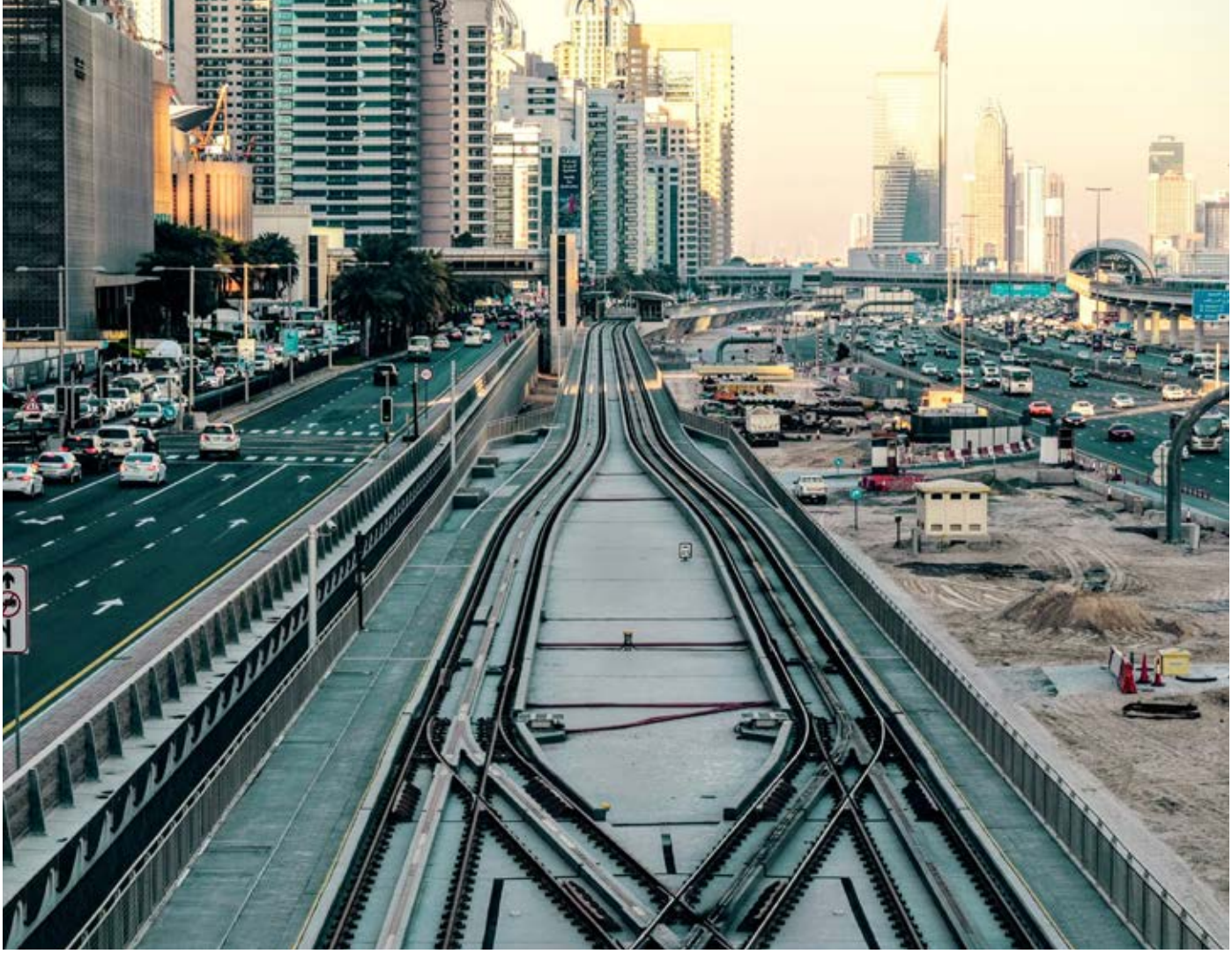
Develop a program that targets growth-stage tech enterprises in the region and beyond to relocate to the UAE

Play a role in easing market access for tech entrepreneurs

Ease cross-border regulatory differences between the UAE and KSA

Form partnerships with chambers of commerce in target markets to create cross-border linkages

Open market development offices in key cities including Cairo, Riyadh and Amman



Conclusion

The impressive spending and focus on developing the tech entrepreneurship ecosystem and the innovation agenda are in line with the government agenda to create high-quality jobs in the knowledge economy, while attracting citizens to take them up.

These efforts, in some cases globally unique or formed with global leaders, are likely to deliver the government's aims to build a solid foundation and shift the country toward non-oil revenues. However, the recent nature and scale of the initiatives mean that many will only bear fruit in the long term.

Continuing to take a centralized yet loose view of the ecosystem, provide opportunities for both local and expat entrepreneurs, and build the regulatory foundation of innovation will ensure that efforts are maximized. Long term, the UAE has the potential to be an example of the rapid development of an innovation-based ecosystem.

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UAE at a glance

At USD 349 billion, the United Arab Emirates (UAE) is the world's 30th largest economy and the 3rd largest economy in the Middle East/North Africa (MENA) region. It consists of a relatively new constitutional federation of seven states[6] with a population of c. 10 million[7]. This combination of federated monarchies is one of the larger countries in the Gulf Cooperation Council, the network of wealthy, oil-rich nations known as the GCC. Abu Dhabi, the capital, and Dubai are the two largest emirates, and they regularly attract global attention for their investments and government plans.

As a constitutional federation, the UAE has legislation at the federal and emirate levels, with each emirate maintaining a system of government controlled by its royal family. The civil jurisdiction legal system is based on a mix of English, Egyptian, and Sharia law. This shapes and informs the legal framework for criminal, social, and business activity.[8]

The seven emirates that make up the UAE have varying degrees of dependence on oil revenues and the nation has the world's seventh-largest oil reserves.[9] Yet the country has invested to shift the economy from oil dependency to other sources of government revenue and non-oil revenues now make up c. 70% of GDP, a number that is projected to grow to 80% by 2021.[8] Vision 2021, the national plan for the country, has highlighted six pillars – including developing a knowledge economy – and in the process aims to "make the UAE the economic, tourism and commercial capital for more than two billion people".[10]

Demographically, the UAE is highly diverse, with a local population of 15% and the vast majority of residents are immigrants from other MENA countries, Asia, and the West. [11]

The UAE is heavily dependent on expat workers, most of whom are attracted to the country to work in large multinationals or established local entities.

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6. The UAE government. "The political system". https://government.ae/en/about-the-uae/the-uae-government/political-system-and-government (accessed December 14, 2017)

7. Gulf News. "UAE population and statistical trends". http://gulfnews.com/news/uae/government/uae-population-and-statistical-trends-1.1931464 (accessed December 14, 2017)

8. Arabian Business. "Decoding the legal framework for entrepreneurs in the UAE". http://www.arabianbusiness.com/decoding-legal-framework-for-entrepreneurs-in-uae-666321.html (accessed December 14, 2017)

9. US Embassy of the UAE. "The UAE and Global Oil Supply" https://www.uae-embassy.org/about-uae/energy/uae-and-global-oil-supply (accessed December 14, 2017)

10. The UAE Cabinet. "National Agenda". https://uaecabinet.ae/en/national-agenda (accessed December 15, 2017)

11. Gulf News. "UAE population edging closer to 10m". http://gulfnews.com/news/uae/society/uae-population-edging-closer-to-10m-1.1579486 (accessed December 15, 2017)

A PPP adjusted per-capita income of USD 68,092 makes the UAE one of the wealthiest countries in the world [12] and it remains a destination for the super-rich for both living and leisure.

Given the high income levels and non-citizen population that is almost fully employed, social and economic issues such as unemployment or poverty are at minimal levels. However, other areas of focus have driven the government to institute large-scale economic plans aimed mainly at shifting both the balance and demographics of certain industries and sectors. The main aim of an ongoing Emiratization program is to increase the proportion of Emiratis in the private sector, luring them away from the public sector where c.94% are currently employed. [13]

Though the current levels of unemployment are low, the ratio of the citizen population aged 15-19 to those aged 55-59 of 1.5 suggests a rapidly-growing citizen workforce that will demand a large number of jobs. To address this need, the emirates of the UAE are executing long-term plans to grow the number of high-value jobs and are in the process of transforming into a knowledge economy. The UAE's Science, Technology and Innovation's Higher Policy, announced in 2015, includes 100 initiatives with upwards of AED 300 billion in investment (USD 82 billion). [14]

Figure 1. *Macroeconomic indicators for the uae, 2016*

	Value	Rank (192)
GDP (USD)	349B	30
GDP per capita (PPP adj. USD)	68K	8
Population (millions), 2016	10m	94
Rate of population aged 15-19 over those aged 55-59	1.46	
SME contribution to GDP, 2016	30%	
Consumer expenditure as a % of GDP	59%	
Stock market cap as a % of GDP	61%	
Stock market traded as a % of GDP	14%	

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

Apart from oil and gas (31% of GDP), key industries for the UAE include real estate (22%), retail (12%), tourism (9%), and logistics (8%).[15] The country also serves as a hub for media and television broadcasting, as well as a finance hub, and is home to some of the largest investment funds in the world, both private and sovereign wealth funds (SWF). Abu Dhabi Investment Authority (ADIA), controls close to USD 800 billion in assets, making it the second-largest SWF in the world.[16] Other apital – invest and acquire large-scale infrastructure and private-sector entities in the UAE and abroad, putting them in a good position to stimulate knowledge sharing and public-private partnerships. For example, Mubadala subsidiary Advanced Technology Investment Company's (ATIC) mandate is to drive technology development in the UAE, and it has already made multi-billion-dollar investments in semiconductor makers Global Foundries and Chartered Semiconductor Manufacturing. [17]

12. IMF. "World Economic Outlook Database October 2017". https://www.imf.org/external/pubs/ft/weo/2017/02/weodata/index.aspx (accessed December 14, 2017)

13. The National. "Shorter work hours and patriotism main reasons Emiratis prefer public-sector jobs: study". https://www.thenational.ae/uae/government/shorter-work-hours-and-patriotism-main-reasons-emiratis-prefer-public-sector-jobs-study-1.202046 (accessed December 15, 2017)

14. Gulf News. "Dh300b projects in UAE to spur knowledge economy". http://gulfnews.com/news/uae/government/dh300b-projects-in-uae-to-spur-knowledge-economy-1.1623814 (accessed December 15, 2017)

15. Trends Institution. "UAE GDP composition by sector 2015 (%)". http://trendsinstitution.org/wp-content/uploads/2016/06/Radwa-Graph-1.png (accessed December 15, 2017)

Figure 2. Global competitiveness index scores of the uae, 2016

	Score (1-7)	Rank (138)
Global Competitiveness Index	5.3	16
Institutions The quality of legal and administrative framework that regulates interactions between government, firms and people	5.8	7
Infrastructure Existence of extensive and efficient infrastructure to supply required services	6.3	4
Market Size Size of the economy	4.9	37
Macroeconomic environment Stability of the economy	5.3	38
Goods market efficiency Intensity of local competition, ease of doing business, tax rates, imports ratio and buyer sophistication in a country	5.6	3

Source: World Economic Forum

Government investment in the infrastructure, private sector, and culture of tolerance has made the country one of the most attractive destinations to foreign skilled talent. Branding itself as a haven of tolerance, all faiths are respected and the religious and cultural diversity is a strength in the region. With infrastructure and amenities that resemble the West and weather that surpasses that of Europe, the attractiveness of the country to professionals makes it the natural home for multinationals seeking to establish a regional presence. Now, many of the world's biggest multinationals are choosing the UAE to set up offices or regional hubs including Google, IBM, Microsoft, Facebook, CNN, and Pfizer.

The large number of immigrants and guest workers mainly arrive on work visas, although a sizable number set up small businesses. The regulatory structure is favorable to businesses, although there are restrictions that govern the business's registration depending on its ownerships structure. 100% foreign ownership is permissible in the country's 45 free zones, most of which have a sector focus ranging from finance to flowers.[18] The free zones are physical, and in some cases, virtual areas that accommodate multinationals, large local entities, and small businesses. Anchor tenants are often the world's biggest companies or brands, such as HSBC, Visa, CNN and Google.

SMEs, defined differently across the Emirates, have generally under 50 employees or AED 250m in turnover and make up a relatively smaller proportion of the economy at just 30% contribution to GDP despite accounting for 90% of the total number of companies and 94% of the workforce.[19] Within this sector, innovative young companies have launched and grown, making it an important sub-sector for a government shifting from oil and gas to innovation. Yet the low contribution from SMEs has, at times, meant limited influence on the developing banking and regulatory infrastructure. As a result, many changes are now being made to make the country more accommodating to young businesses, changes that are expected to drive the formation of many new ventures.

The UAE government has dedicated large amounts of capital and focus into large-scale innovation projects such as Abu Dhabi's Masdar City, introducing tech entrepreneurship classes at universities, driving public-private partnerships, and refining a regulatory infrastructure to make it as attractive as possible to private-sector development, investors, and skilled capital.

15. Trends Institution. "UAE GDP composition by sector 2015 (%)". http://trendsinstitution.org/wp-content/uploads/2016/06/Radwa-Graph-1.png (accessed December 15, 2017)

16. SWFI. "Fund Rankings". https://www.swfinstitute.org/fund-rankings/ (accessed December 15, 2017)

17. Gulf News. "Abu Dhabi gets full ownership of Global Foundries". http://gulfnews.com/business/sectors/investment/abu-dhabi-gets-full-ownership-of-global-foundries-1.992025 (accessed December 15, 2017)

18. Gulf News. "45 free zones in the UAE: Find the right one for your new business". http://gulfnews.com/guides/life/community/45-free-zones-in-the-uae-find-the-right-one-for-your-new-business-1.1716197 (accessed December 15, 2017)

19. Souq al Mal. "How do you define an SME in the UAE?".https://www.souqalmal.com/financial-education/ae-en/how-do-you-define-an-sme-in-the-uae/ (accessed December 15, 2017)

Results of tech entrepreneurship - Outputs

Across the UAE, the strength of government commitments to innovation has yielded both a high startup density as well as a rich network of support services and foundational programs to drive long-term innovation potential. The country scores relatively highly in a number of indicators, making it a rising star and it is on track to becoming a global front runner in tech entrepreneurship.

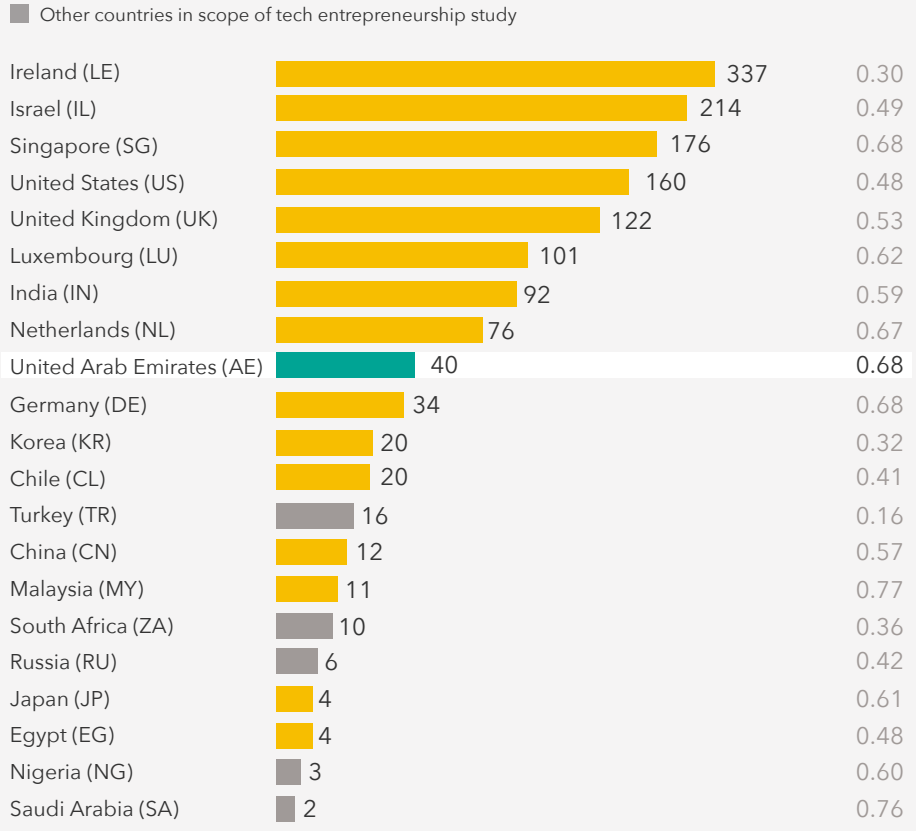
The UAE is responsible for nearly 40 percent of the region's top exits, although few have been over USD 100 million. E-commerce play Souq.com's acquisition by Amazon for USD 600 million set the record for the region, but this was quickly followed by acquisitions of Namshi (USD 151 million for a 51% stake), and JadoPado (for an undisclosed amount).

Innovation capability is still under development but investments in R&D projects at the public and private-sector levels, and a sustained focus on STEM within universities and as part of innovation projects, are likely to yield results in the long term.

United Arab Emirates vs. benchmark countries

Economic Contribution

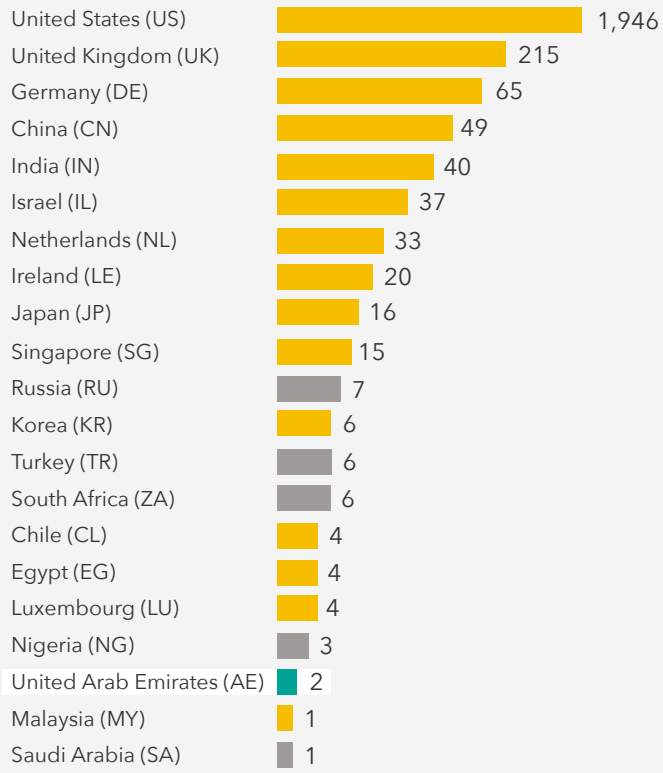
Tech startup prevalence in a country [a]
Per million urban population
Tech startup longevity (1=highest, 0= lowest)



Note: The definitions of the output indicators can be found in the appendix

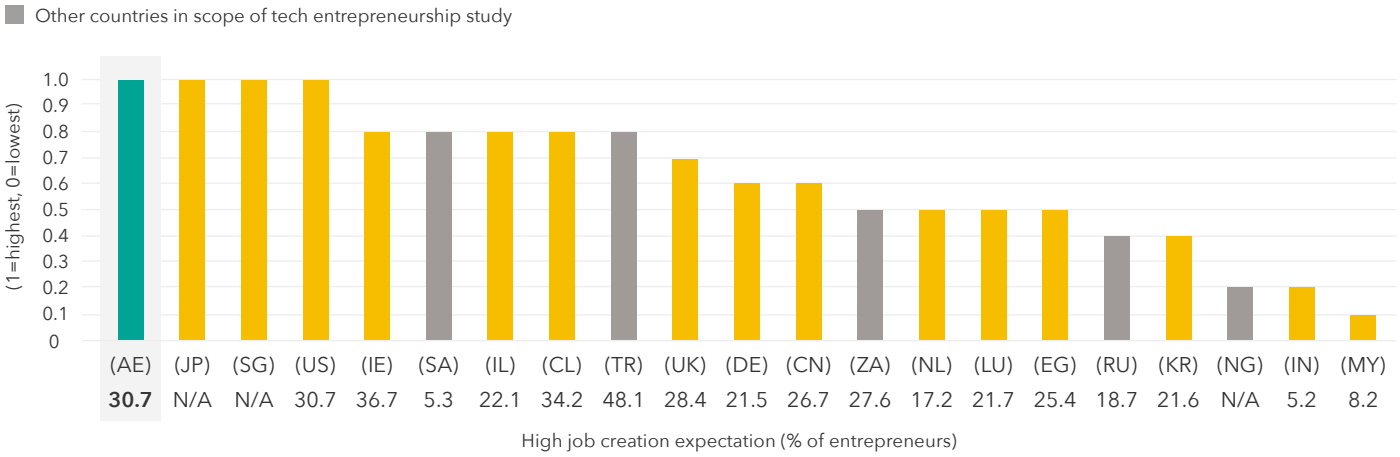
a. Density shows proportional values among ecosystems. Scales are only comparable within each indicator

Number of exits over USD 100m 2012-16



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



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

Ability to create globally recognized "Unicorns" [c]

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

Total number of unicorns | Total value (USD B)

Benchmark country set **(globally)**

278 | $1,174b

Some unicorns:

coupang, Uber, Alibaba Group, Grab, Pinterest, Snapchat, Kuaishou, airbnb, Zappos.com, Delivery Hero, SUPERCELL

Benchmark country set **(UAE)**

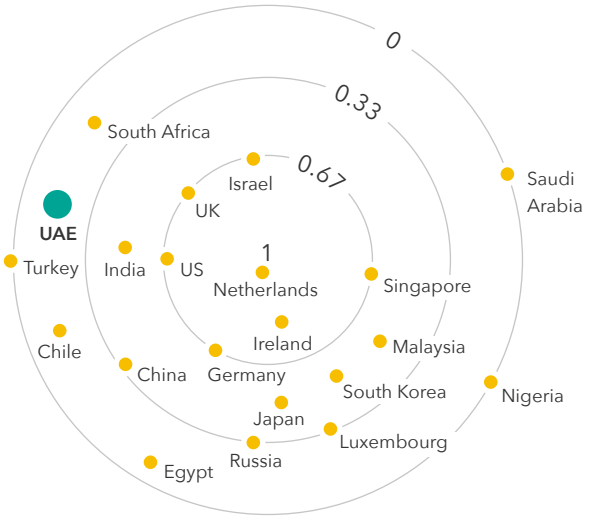
1 | $1b

One unicorn:

Careem

Contribution of knowledge sectors to the economy

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

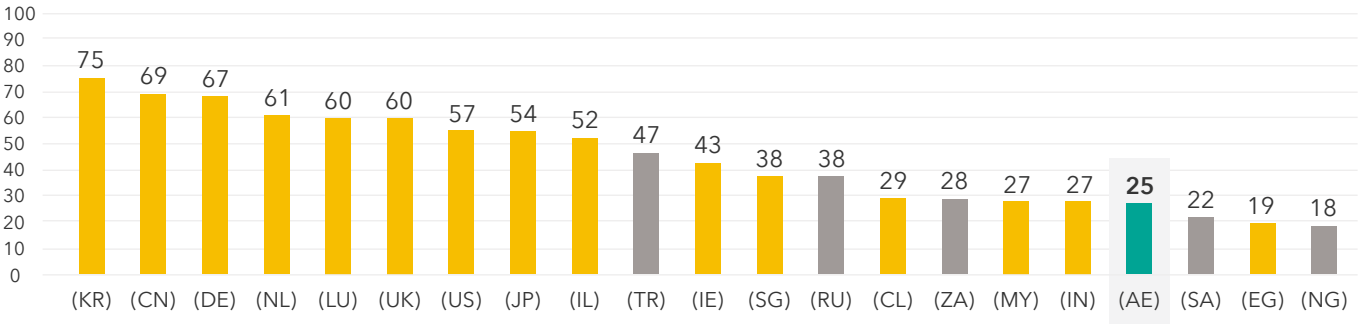


Innovation Creation

Innovative output density

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

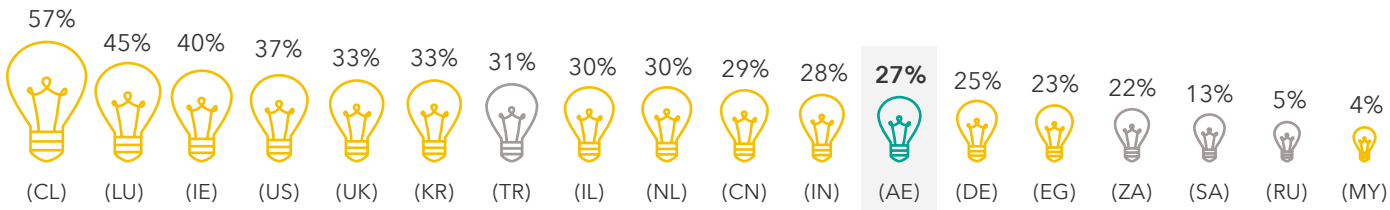
Other countries in scope of tech entrepreneurship study



Entrepreneurial innovation creation [d]

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

Other countries in scope of tech entrepreneurship study



Note: The definitions of the output indicators can be found in the appendix
Source: OC&C analysis based on World Bank, GEM, GEDI, Crunchbase, INSEAD, McKinsey, CB Insights

c. Unicorns in tech-related categories are taken into consideration

d. Some benchmark set countries are not shown due to data availability

UAE tech entrepreneurship ecosystem overview

The UAE benefits from an extraordinarily high commitment by government and independent programs to support the tech ecosystem. This commitment, coupled with the country's attractiveness to expat professionals and its location as a regional hub for certain industries such as oil and gas and finance, has made this an ideal mixture of inputs to develop the entrepreneurship ecosystem.

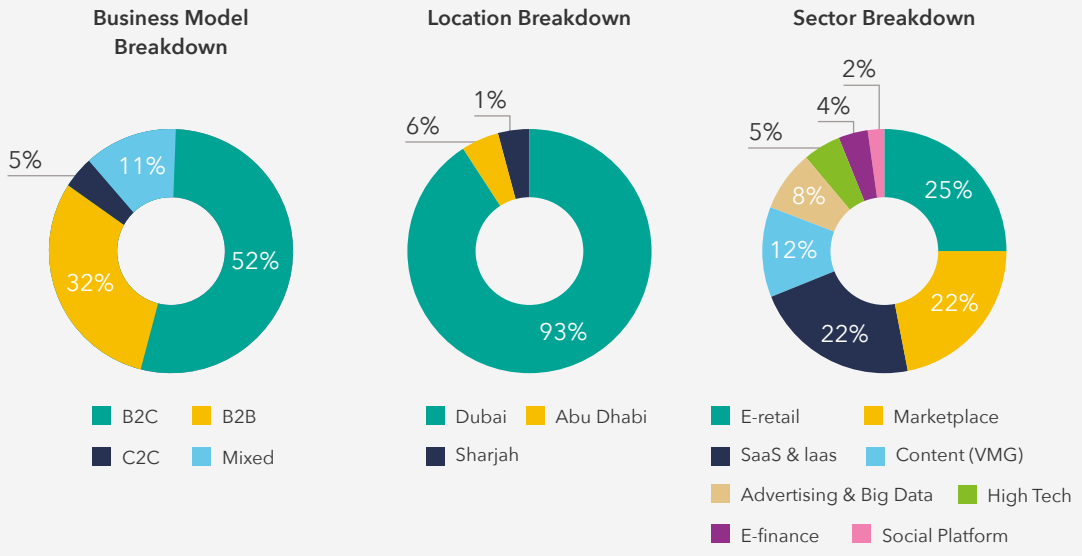
Given the high level of independence of different emirates, most of the government initiatives are implemented at the emirate-level and do not apply across the whole country. Although research was conducted with players across multiple emirates, most participants were from Abu Dhabi and Dubai.

Some ecosystem participants credit the formal launch of the UAE tech ecosystem with the 2010 event Celebration of Entrepreneurship (CoE), at which Wamda, a platform to "inspire, empower, and connect" entrepreneurs in the Middle East[20], was lunched. Wamda[21] now includes an investment fund, media arm, and events arm, and has been joined by a number of incubators, private and government programs targeting entrepreneurship, and other services that are improving the health of the tech ecosystem.

The country has traditionally been dominated by large multinational and established local companies, with an SME contribution of just 30% to GDP.[22] In addition, the research and development infrastructure is in its early stages with strong public and private-sector commitments that will demonstrate their value over time.

The large number of expats in the country who participate in entrepreneurship

Figure 3: *Profile of the Top 100 Tech Startups in the UAE Ecosystem*



20. Balakrishnan, M. Stephens; Michael, Ian. "Abraaj Capital Limited: Celebration of Entrepreneurship (CoE)". http://www.skyonefze.com/images/uploads/newspdfs/case_study.pdf (accessed December 16, 2017)

21. Wamda. "Announcing the new Wamda: A 360 degree approach to supporting entrepreneurship in MENA ". https://www.wamda.com/2012/01/-announcing-the-new-wamda-a-360-degree-approach-to-supporting-entrepreneurship-in-mena (accessed December 16, 2017)

22. Global Entrepreneurship Monitor. "GEM 2016/2017 Global Report". http://www.gemconsortium.org/report (accessed December 16, 2017)

and the many government programs targeted at citizens suggest that not all startups have practical access to all programs and initiatives. Over time, this could indicate some missed opportunities for knowledge sharing.

The government's strong commitment to stimulating youth entrepreneurship – both tech and non-tech – is a cornerstone of its strategic aim of increasing the proportion of citizens employed in the private sector. This is also designed to address the looming need for a large number of new jobs to accommodate a growing youth population that is about to enter the workforce. The proportion of citizens employed by the government is one of the highest in the world at 94%, a level that is not viewed as sustainable in the long term. By making the private sector more attractive to citizens and encouraging them into entrepreneurship, the governments of the Emirates hope to both stimulate the growth of the non-oil economy as well as provide a sustainable source of attractive employment for its citizens.

The UAE government has instituted a national entrepreneurship program for schools, [23] alongside other youth-targeted initiatives such Abu Dhabi's annual Akoun business idea competition that takes place at universities.[24]

The UAE has introduced a 'CEO of Innovation' role across different government agencies to champion the innovation agenda across different public sector functions.[25] However, without a central authority overseeing efforts at the federal level, most activity happens at the emirate or free zone level. A number of programs and funds form the cornerstone of the government's commitment to tech entrepreneurship, particularly for citizens:

- Khalifa Fund – has distributed over AED 1bn (USD 270 million) in loans to Emirati entrepreneurs and recently launched the IBTIKARI innovation incubator [26]

- Dubai Future Foundation and its incubator Dubai Future Accelerators have been created to shape the future of Dubai through medium and long-term investments and to help achieve Dubai's Future Agenda. [27]

Private sector and independent initiatives have shaped the development of the tech startup ecosystem, often located in the UAE but targeting companies across the region or the world:

- Wamda and its fund Wamda Capital – an ecosystem platform designed to connect entrepreneurs in the MENA region and a related seed and follow-on investment fund.
- Astrolabs – A co-working space and innovation hub sponsored by Google and other private-sector companies.

Other initiatives, such as Dubai SME, are tasked with supporting the needs of young companies overall and, at times, provide meaningful support to tech startups.

23. The National. "Entrepreneurship and innovation must be taught at UAE universities: survey". https://www.thenational.ae/uae/entrepreneurship-and-innovation-must-be-taught-at-uae-universities-survey-1.154165 (accessed December 16, 2017)

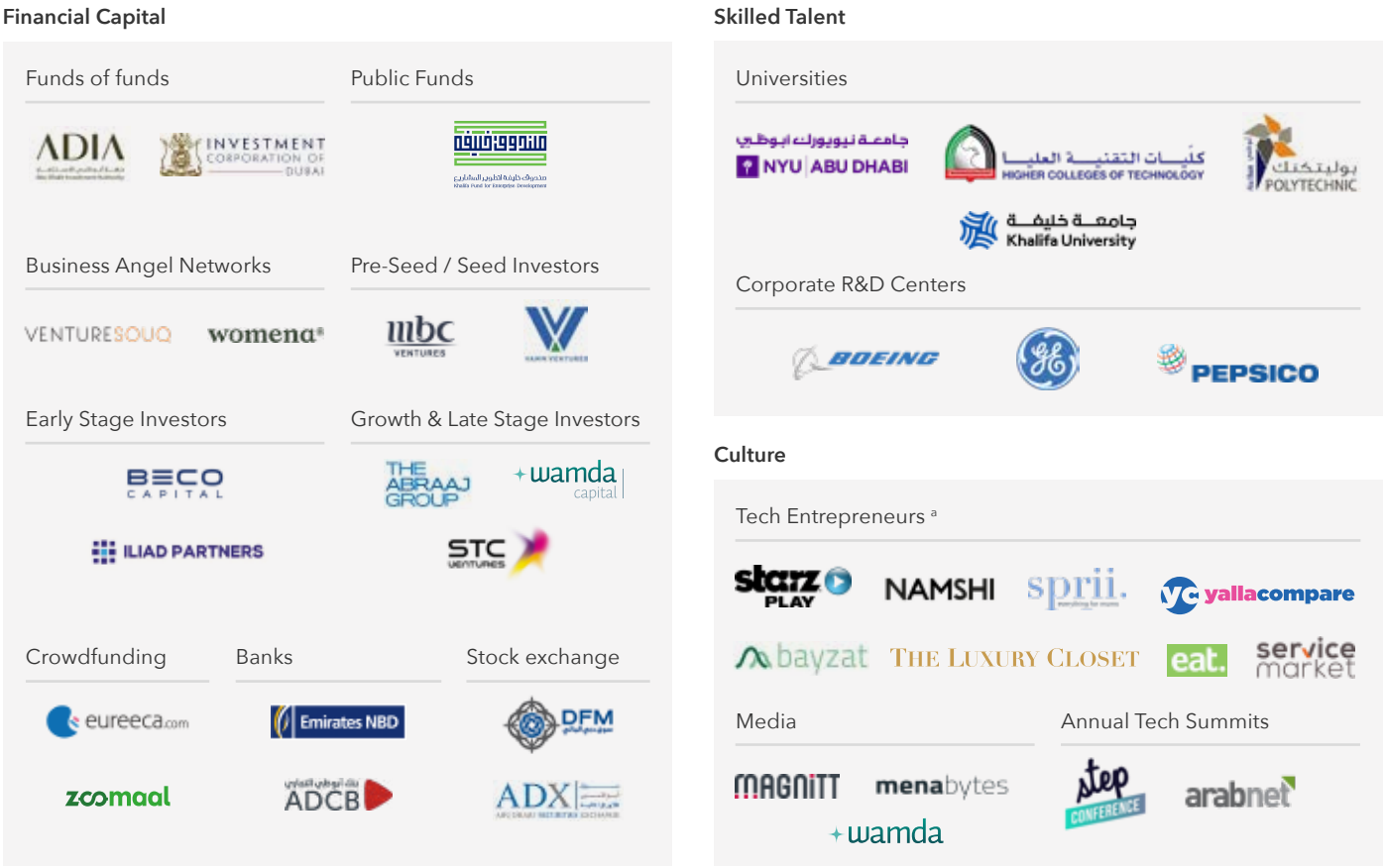
24. Gulf News. "UAE backs up winning spirit of entrepreneurship". http://gulfnews.com/news/uae/education/uae-backs-up-winning-spirit-of-entrepreneurship-1.1160836 (accessed December 16, 2017)

25. Gulf Business. "UAE Creates 'CEO Of Innovation' Post For Government Agencies". http://gulfbusiness.com/uae-creates-ceo-innovation-post-government-agencies/ (accessed December 16, 2017)

26. Gulf News. "Khalifa Fund to launch first incubator for innovation in UAE". http://gulfnews.com/news/uae/government/khalifa-fund-to-launch-first-incubator-for-innovation-in-uae-1.1455322 (accessed December 16, 2017

27. Dubai Future Foundation

Figure 4. Major actors within the UAE entrpreneurship ecosystem



Source: Crunchbase, Wamda Capital, Central Bank of the UAE, Invest UAE, 4icu, The National, Gulf News, Telcoma

a. Startups that are founded after 2010 and have technology-related businesses

Young tech companies in the initial years of the ecosystem mainly reflected business models that were successful elsewhere. Ecosystem participants report that this helped with investor confidence while filling a gap in the market. As a result, the current crop of tech companies present in the country are largely E-commerce and platform sites (25 percent and 22 percent of total, respectively), followed by infrastructure/software as a service sites (22 percent of total). 52 percent of all startups are B2C, and 93 percent of tech startups are located in Dubai.[28] Despite this concentration, free- zone entities and incubators in different emirates also play home to incubators and startup competitions, such as Ras Al Khaima Economic Zone's Startup Champ Competition.[29]

Most investors look to the regional record of exits to understand the return potential. Within this pool, UAE companies have performed particularly well, and have been responsible for 38 percent of MENA's exits[30]. 2017 was a particularly good year as it saw the exit of over three large tech companies, including the region's record-setting acquisition of Souq.com by Amazon for c. USD 600 million. Yet, no 'unicorns' have exited yet (although Careem is valued at above USD 1bn)[31], a milestone closely watched by investors to prove the growth potential of the ecosystem. As tech companies are continually acquired and raise funding at high valuations, the ecosystem will become increasingly attractive to local and international investors.

As existing business models are proven and exits are realized, the next generation of innovations is likely to be more specifically adapted to the needs of the region and the early investments made by the government. Critical development areas such as healthcare, finance, transportation, logistics, and energy, as well as deep-tech investments such as artificial intelligence and the block chain, are likely to feature more in the number of startups that are launched in the country.

In a review and field research of the pain points of the tech entrepreneurship ecosystem in the UAE, three areas of focus were identified:

Business setup and first-year operating costs for tech startups are among the highest globally, although the low-tax nature of the ecosystem means that ongoing costs are lower than other places

Consistently, ecosystem participants cited setup and early operating costs as a major area that impacts how and when entrepreneurs choose to launch in the UAE. With a total first-year expenses obligation that can reach up to USD 17,000,[32] getting set up in the UAE as a tech startup requires significant upfront costs.

Two of the key drivers for early operating costs are the visas and the requirement to rent office space. Unlike other ecosystems where the majority of startups are founded by citizens, in the UAE, immigrants make up the bulk of the population and therefore the majority of tech entrepreneurs. This creates the need for visas for the founding and operational team members who will reside in the UAE. However, although visas are almost always needed to build a team, the process and requirements in the UAE are remarkably straightforward. Unlike countries such as the UK and US, most applications require simple paperwork and documentation rather than lengthy approvals and interviews.

The need for office space, at one time a big driver in the UAE's property boom, creates an operational cost that many new startups globally rarely face. Different programs exist that reduce the cost for young companies, including options that subsidize the requirement or allow hot-desk options, but it still remains a significant operational cost. In addition, the number of visas allowed for young companies is linked to the office space that they rent, which can, at times, constrain their ability to quickly build a team or scale.

28. Crunchbase

29. Ras Al Khaimah Free Trade Zone. "RAK FTZ Announces the Startup Champ Competition" Winner. http://www.rakez.com/About/News-And-Events/ArticleID/53004/RAKEZ

30. Magnitt. "Startup fever: MENA exits reach $3 billion over five years ". https://www.magnitt.com/startup-fever-mena-exits-reach-3-billion-over-five-years (accessed December 16, 2017)

31. Arabian Business. "How is Careem worth $1.2bn? ". http://www.arabianbusiness.com/interviews/transport/379837-how-is-careem-worth-12bn (accessed December 16, 2017)

32. OC&C analysis based on Shuraa, Visaprocess, Emirates 24/7, Mitula, Rizmona, Government.ae, Du, Glassdoor

> Two of the key drivers for early operating costs are the visas and the requirement to rent office space.

The UAE ecosystem is remarkably active and highly resourced, yet the nature of the regulatory framework means that some gains will only come over time

The tech startup ecosystem, and its regulatory framework, is in the early stages of development. Two aspects of this stage of development are impacting startups: the stage of development itself and the laws that are being written into the regulatory infrastructure, as well as the history and precedent that allows the legal community to see how the law is interpreted and applied. In addition, the different regulatory structures for different free zones have the potential to create enough choice so that tech startups are able to select the appropriate jurisdiction, but add to the challenge of fully understanding the regulatory options.

New free zones in DIFC and the ADGM hold significant promise to attract both foreign and local startup registrations. ADGM is designed to be 100% the same as English common law, mirroring offshore jurisdictions such as the Cayman Islands and the British Virgin Islands. The structure and location are designed to make it as attractive as possible to new startups looking to register and to reassure both local and foreign investors that the jurisdiction can successfully manage the needs of tech startups and other business entities such as Special Purpose Vehicles (SPVs).

However, even regulatory jurisdictions modeled on the best-in-class jurisdictions need time to fully develop and reassure the wider market that they are fit for purpose. This will take time to develop, as the market needs time to learn how new regulations are interpreted and how dispute cases are settled.

The market potential of tech startups is shaped by their ability to move across borders to other Gulf and other MENA countries, given diverse cross-border requirements

Due to the size of the UAE, tech startups that launch there must target the wider region – and beyond – to create a sustainable, addressable market. This wider reach means that tech startups are international from the beginning, but also comes with the challenges of having to factor in cross-border considerations early on. This adds complications to the already-challenging task of launching a tech business.

Critical markets for UAE startups are often seen as KSA and Egypt, which have a combined population of over 100 million. To achieve this, most startups first look to expand from UAE into its neighbor KSA and other smaller Gulf countries then later into Egypt and other MENA countries. Despite a common language and religion, the distinct nature of dialects and cultures in each country creates significant complexity for successfully acquiring customers in different MENA markets.

Added to this complexity are written and unwritten rules that define how foreign businesses can operate in these countries. Despite a trade union between the Gulf countries, enough differences exist to create both operational challenges as well as additional costs between countries. This is particularly the case in some sub-sectors such as E-commerce, which requires goods to be shipped across borders, triggering customs and duty regulations that differ per country in terms of how they are written or interpreted. It also requires KSA-specific distribution and sales companies, which are subject to different set-up and capital requirements based on the number of Saudi founders and board members.

Cultural practices can also play a role. In some countries such as KSA, local businesses prefer to use personal networks to do business, requiring UAE startups to have a local partner who is well-connected to be successful.

Insights into ecosystem components

1. Financial capital

Successful tech startups require adequate and timely funding tailored to the startups' needs, coupled with the guidance and support required for healthy growth.

There are five main sources of equity finance that are available to 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** (strategic acquisitions, direct investment and via corporate venture funds [CVCs]) – to acquire industry-specific solutions, or for corporate innovation exposure
- **Initial Public Offerings** (IPOs) – in the local and foreign stock exchanges that also signal success to a wider audience.

The country benefits from a very large amount of investor capital, yet the formal investment structure of angel groups and venture capital funds is still evolving. The trend is promising, however, and it points to accelerated growth. UAE tech startups received USD 100 million in funding in 2014, but just two years later received ten times that amount at USD 1 billion.[33] Ecosystem participants credit the strong presence of family offices and high-net-worth individuals for a largely informal investment landscape, where investors use personal networks to make investment decisions. Formal angel networks and formal venture capital funds are increasing, and these are joined by a growing number of family offices and high-net-worth individuals who invest directly in technology.

- **Angel Investors –** the large number of high-net-worth (HNW) individuals has created an investor pool from which a growing number of angel networks are forming. Networks include Dubai Angels, WOMENA, WAIN, Venture Souq, Envestors, and others.
- **Family offices and HNWs –** In the UAE, unlike many tech ecosystems, a large amount of capital is located outside of institutions within family offices or with HNWs. This has meant fewer restrictions and more freedom for the investors to direct funds as they see fit, unlike institutional funds in other markets such as pension funds which typically have quite strong restrictions and risk/return requirements.

33. CB Insights. "Blooming Desert: The Top United Arab Emirates-Based VCs And Their Tech Investments In One Infographic" https://www.cbinsights.com/research/uae-tech-startup-venture-capital-investment/ (accessed January 4, 2018).

• **Venture Capital –** there are a growing number of VC funds targeting seed and growth-stage tech companies in the UAE with a traditional structure like other ecosystems, particularly Wamda Capital, BECO Capital, MEVP, and iMENA Group.[34] Alongside these firms, which are registered 'holding companies', there are others – sometimes backed by high-net-worth individuals/families or investment arms of established local companies – that make direct investments in tech companies. These companies may invest less formally than a VC firm, with a less defined process, but overall they often participate at the same rate and engage in the same deals as VC firms. The holding company structure may be used to shield directors and related entities from the strict regulatory requirements that formal investment funds face.

• **Public sector funding –** the government has invested heavily in the tech innovation sector directly via investment funds, via mandates that are part of sector-specific funds, and via funded incubation and R&D programs. Initiatives include the ICT Fund, which has invested more than USD 400 million in incubators, R&D, and education[35] and the Fund to Finance Innovation, which has allocated AED 2 billion (USD 540 million) for innovations within strategic sectors including energy, water, and technology.[36]

• **Corporate funding –** there are few formal CVC funds, outside of high-profile ones such as MBC Ventures and Saudi Telecom's UAE-headquartered STC Ventures. However, many corporates that are local companies may invest directly from their balance sheets or via key executives or owners

> "This is still a region where the domestic population goes where the government leads. So the government is a big signaler of how to allocate capital. Traditionally there was a really big focus on real estate but in the past few years there has been a noticeable shift in favor of the tech sector and wider knowledge economy."
>
> ***Patrick Rogers,***
> *Co-Founder & Principal, Support Legal*

The UAE is home to some of the world's largest funds and wealthiest individuals, although the early stage of the ecosystem means that investment is still evolving to fit the needs of young companies

• The GCC region, and the UAE in particular, stands out for the amount of investment capital available across sovereign and private investment funds as well as family investment offices and high-net-worth individuals. The funding available in the country may be as much as USD 1 trillion.[37]

• While the total capital available may be high, the amount of capital earmarked for the tech ecosystem is still moderate due to a number of factors that present challenges to otherwise willing investors. The fund size and administrative processes required to support transactions favors funds executing fewer, large transactions rather than multiple smaller ones. Over time this has meant increasing funding of large-investment sectors such as infrastructure and real estate. In contrast, the due diligence and ticket sizes associated with small tech companies make them relatively unattractive for the larger funds to execute and monitor.

34. CB Insights. "Blooming Desert: The Top United Arab Emirates-Based VCs And Their Tech Investments In One Infographic" https://www.cbinsights.com/research/uae-tech-startup-venture-capital-investment/ (accessed January 4, 2018).

35. Gulf News. "ICT fund invests Dh1.6 billion in projects in the UAE". http://gulfnews.com/business/sectors/telecoms/ict-fund-invests-dh1-6-billion-in-projects-in-the-uae-1.1415724 (accessed December 17, 2017)

36. Government.ae. "9. Industry, innovation and infrastructure ". https://government.ae/en/about-the-uae/leaving-no-one-behind/9industryinnovationandinfrastructure (accessed December 17, 2017)

37. OC&C analysis, based on assets under management of an estimated USD 792 billion, Mubala of USD 125 billon, Abraaj of USD 14 billion, Gulf Capital for USD 500 million, for a total of USD 931 billion. This figure does not include family offices, other PE funds, or the investment capital of the royal/ruling families

• However, several sources of typically large-scale investments have made a special effort to accommodate this growing sector: private equity behemoth Abraaj Capital acquired USD 700m seed fund Riyada Capital in 2009[38], and Wamda was lunched.[39] In 2017, business tycoon Mohamed Alabbar launched a USD one billion fund Adeptio, which subsequently seeded the launch of E-commerce play Noon.com[40] and invested in a USD 250m fund with VC MEVP.[41]

• Outside of these other initiatives, most large investors struggle to support the unique growth and return profile of tech entrepreneurship. The sectors that have historically received the most investment, such as real estate and retail, often rely on asset or inventory-backed businesses with clear valuation guidelines, growth expectations, and risk profiles. In contrast, tech entrepreneurship features asset-light businesses with a great deal of intangible value and uncertain risk and growth expectations.

• Due to these factors, the investment community is evolving to meet the needs of the tech entrepreneurship ecosystem and its unique investment and growth profile. Early initiatives and experimentation are happening at the individual level, often led by high-net-worth individuals who invest on the strength of personal networks or established track records. Alongside this, the investment community closely watches the funding and valuation updates of the sector's top scale-ups such as Fetchr's USD 11m+ raise from Silicon Valley investors or Careem's USD 1bn plus valuation.[42- 43]

• As more high-profile exits such as Souq.com's 2017 acquisition by Amazon happen, the investment community is likely to understand how to better support tech entrepreneurship in the country.

While seed capital is plentiful in the UAE, later-stage rounds are more difficult to secure. Larger startups often go to Silicon Valley and other ecosystems when they resemble market leaders in their categories or can demonstrate their international market potential

• The emergence of a number of seed funds and angel networks including Venture Souq, WAIN, WOMENA, Dubai Angels, Envestors, and a high number of unaffiliated high-net-worth individuals has meant that seed funding is beginning to grow in the region, particularly from individual and specially targeted funds. There are also accelerators such as in5 and DFA, which can provide early grant and investment funding to startups that are just launching.

• Ecosystem participants report that, after leaving these programs, entrepreneurs must carefully consider how to raise follow-on funding rounds, as the venture capital industry is growing but still may feature mismatches between the stages of funding and the needs of a cohort of tech companies.

38. The Abraaj Group. "Abraaj Capital Group Acquires Leading VC Firm Riyada" https://www.abraaj.com/insights/news/press-releases/press-release-abraaj-capital-group-acquires-leading-vc-firm-riyada-to-spear/ (accessed December 17, 2017)

39. The Abraaj Group. "Abraaj Capital unveils Wamda under 'Inspire. Empower. Connect.' platform". https://www.abraaj.com/insights/news/press-release-abraaj-capital-unveils-wamda-under-inspire-empower-connect/ (accessed December 17, 2017)

40. Gulf News. "Saudi Arabian wealth fund takes 50% stake in Alabbar's Adeptio". http://gulfnews.com/business/sectors/investment/saudi-arabian-wealth-fund-takes-50-stake-in-alabbar-s-adeptio-1.1937270 (accessed January 3, 2018)

41. Gulf News. "Mohammad Al Abbar, MEVP launch $250 million Mena-focused VC fund". http://gulfnews.com/business/sectors/markets/mohammad-al-abbar-mevp-launch-250-million-mena-focused-vc-fund-1.2097218 (accessed December 17, 2017)

42. TechCrunch. "Uber rival Careem closes $500M raise at $1B+ valuation as Daimler steps in". https://techcrunch.com/2017/06/14/uber-rival-careem-closes-500m-raise-at-1b-valuation-as-daimler-steps-in/ (accessed December 17, 2017)

43. Forbes. "Dubai-Based Logistics Startup Fetchr Raises $41 Million To Expand In The Middle East". https://www.forbesmiddleeast.com/en/dubai-based-logistics-startup-fetchr-raises-41-million-to-expand-in-the-middle-east/ (accessed December 17, 2017)

Most local and international investors prefer to invest in offshore-registered entities, given the proven nature of dispute resolution and share class provisions

• As the tech ecosystem has grown rapidly, most entrepreneurs registered at least one entity associated with their business in an offshore jurisdiction such as the British Virgin Islands or Cayman Islands. In some cases, ecosystem participants report entrepreneurs register three entities for different purposes, such as a BVI holding company for investment, a free zone company to hold IP, and an onshore LLC for operations such as deliveries and warehousing.

• This multiple registration process not only creates complexity but also significant costs for young companies. BVI and Cayman registrations are accompanied by administrative processes for making changes to documents, such as shareholding updates or appointing directors, that are quite expensive. Yet, entrepreneurs continue to choose these jurisdictions because of the strength of the dispute resolution process and the ability to offer different share classes, a prerequisite for most tech company investors so that their interests are prioritized in the event of a liquidation or acquisition.

• Over time this is likely to change with the introduction of the ADGM, which mirrors English common law and resembles a Cayman Islands jurisdiction. This will enable local entrepreneurs to register their businesses within the UAE, while enjoying the protections and provisions offered by an offshore jurisdiction at what is estimated to be a fraction of the cost.

High-net-worth or family office LPs are increasingly bypassing VC funds to invest directly, affecting traditionally strong source of investment in venture capital funds

• The traditional model for VC funding requires institutions, high-net-worth individuals, and family offices to invest into funds as Limited Partners (LPs), with minimal involvement in specific decisions made by the firm. This model has enabled VC firms to refine their investment theses and pursue deals based on a predefined set of criteria and with specific targeted risk/return trade-offs.

• Increasingly, ecosystem participants report that family offices and high-net-worth individuals are instead seeking to make direct investments in tech companies, disintermediating VC funds as investors. For some VC funds, this has meant competing with former LPs for favorable deal terms in desirable targets; in other cases, it has meant smaller funds as LPs diverted funding elsewhere.

• Some family offices and HNWs that have shifted to a direct model are still using VC funds for specific services such as deal sourcing and advising on the transaction. In some cases, VC funds have been able to preserve revenues by charging high fees for these services, however, the vast majority affected by this shift are facing both net lower funding rounds and netlower revenues.

Exit paths have only started to emerge in the young UAE ecosystem, although 2017 has been a record year

• Souq.com's landmark 2017 acquisition by Amazon for c. USD 600 million set a regional record for exits and, alongside notable purchases of a majority stake in E-commerce site Namshi.com for USD 151 million and electronics E-commerce site JadoPado, meant that 2017 was the biggest year on record for UAE acquisitions. [44-45-46]

• In addition to these exits, successful later-stage fundraising by leading tech scale-ups Careem and Fetchr, among others, point to strong exit potential in the near future, which is likely to attract acquirers and at high valuations.[47]

• Ecosystem participants predict that recent high levels of activity are likely to have a strong impact on the region over time as investors will be reassured about the return potential of tech companies and, in turn, will direct more funds to the tech ecosystem.This is also likely to affect the expectations of investors, as they will be able to have more established precedent from which to compare and evaluate new investment opportunities that arise. These exits and investment successes also highlight the distinct ways the region offers cross-border opportunities for growth and the challenges that entrepreneurs face in launching and scaling up businesses, securing investors and customers, and navigating a regulatory environment.

Figure 5. Souq.com - An E-commerce success story

SOUQ
an amazon company

• Souq.com is the largest e-commerce site in the Arab world, with over 41 million monthly visits to the website to view one of the 8.5 million unique products in 35 different categories

41 million visits/month

8.5 million unique products

3K employees

575 M funding

• The company has been a pioneer in the Middle East's ecommerce scene and shaped online retailing with its operations in Egypt, Saudi Arabia, Kuwait and the UAE

• In order to tackle payment and logistics problems in the region, Souq has launched PayFort and Q Express to simulate demand and ease the customer journey

• Souq.com has raised USD 575 million in 7 funding rounds in which Naspers and Tiger Global were the leading investors

• "The Amazon of the Middle East" was eventually acquired by Amazon for USD 580 million, despite of its higher valuation

Source: TechCrunch, Crunchbase, Souq.com, Harvard Business Review

44. Gulf News. "Emaar continues shopping spree by buying 51% of Namshi". http://gulfnews.com/business/sectors/retail/emaar-continues-shopping-spree-by-buying-51-of-namshi-1.2032315 (accessed December 18, 2017)

45. TechCrunch. "Rocket Internet sells 51% of fashion site Namshi to Dubai's Emaar Malls for $151M". https://techcrunch.com/2017/05/23/rocket-internet-sells-51-of-fashion-site-namshi-to-dubais-emaar-malls-for-151m/ (accessed December 18, 2017)

46. Gulf News. "Online marketplace JadoPado acquired by leading regional company". http://gulfnews.com/business/sectors/retail/online-marketplace-jadopado-acquired-by-leading-regional-company-1.2020352 (accessed December 18, 2017)

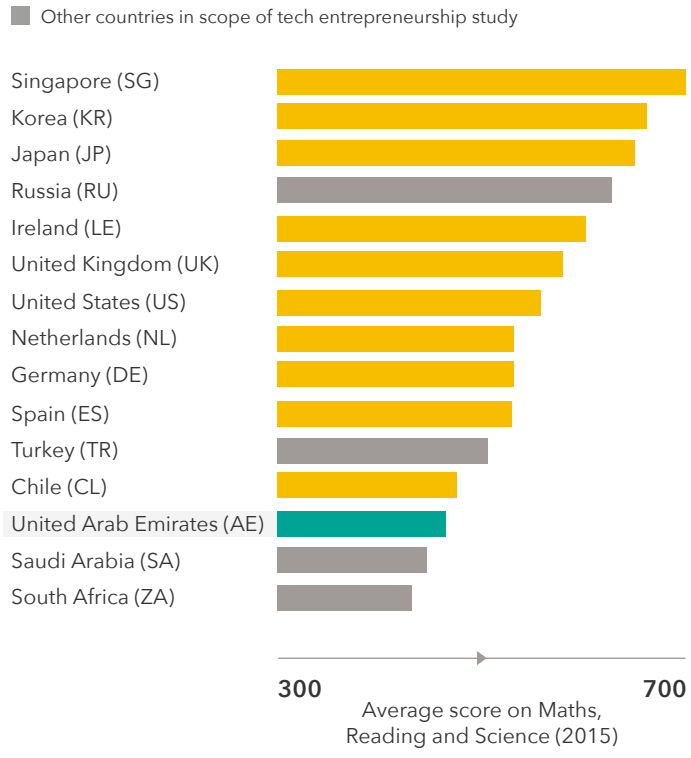
47. Bloomberg. "The Sudden Rise of Arab Startups". https://www.bloomberg.com/news/articles/2017-09-13/hunting-unicorns-in-the-desert-the-sudden-rise-of-arab-startups (accessed December 18, 2017

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.

STEM skills in the UAE are still under development, with continued improvements predicted based on initiatives that are underway. High STEM output in future generations is likely to help drive Emiratis into knowledge-based roles in the private sector, a key aim of the UAE government

Figure 6. TIMSS Maths scores for 10-year-olds



Source: OECD, OC&C analysis

The government has invested heavily in embedding entrepreneurship into school programs and is now targeting tech skills across the Arab world. However, it will take time for these initiatives to impact the job market

- Youth entrepreneurship has been a special focus of governments within the UAE in order to stimulate the shift toward private-sector employment among the younger workforce. One of the biggest commitments was making a course on innovation and business leadership compulsory at all government and private universities and higher education institutions.[48] The course, designed and partially taught by Stanford's faculty, is modeled, in part, on its well-regarded Venture Design program. Other programs included competitions, workshops, and hackathons.
- In 2015 Young Business International hosted an international delegation and fostered a partnership with Dubai Chamber's youth entrepreneurship program.[49]
- NYUAD's annual hackathon is a leading event in the region, drawing teams from around the world to compete.
- The Ruler of Dubai recently announced an initiative aimed at improving the coding skills across the Arab world, called One Million Arab Coders, and which targets teaching coding to 1 million Arabs. Apart from goodwill, the benefits to the UAE are likely to come from both improved skills of its own citizens as well as improving the availability of regional talent, a pool that often serves the needs of UAE tech companies.[50]

48. Emirates 24/7. "New course compulsory at all UAE universities from Jan 2016". http://www.emirates247.com/news/emirates/new-course-compulsory-at-all-uae-universities-from-jan-2016-2015-11-18-1.610985 (accessed December 19, 2017)

49. Youth Business International. "Creating a buzz about entrepreneurship in the UAE". https://www.youthbusiness.org/creating-a-buzz-about-entrepreneurship-in-the-uae/ (accessed December 20, 2017)

50. Khaleej Times. "UAE to create 1 million Arab coders, offer $1m in incentives". https://www.khaleejtimes.com/news/government/uae-to-create-1-million-arab-coders-offer-1m-in-incentives- (accessed December 20, 2017)

Success in attracting global education brands and developing technical universities means the UAE is now home to some of the world's best institutions, driving good foundational education as well as entrepreneurship skills

• A sustained program to target the leading global brands in university and business education has meant that the UAE is now home to second campuses of some of the world's leading universities and business schools.

• New York University's state-of-the-art Abu Dhabi campus covers 15 hectares and cost an estimated USD 1 billion to build, financed by Abu Dhabi sovereign wealth fund Mubadala.[51] Similarly, Paris-Sorbonne's first international campus in its 400-year history is in Abu Dhabi, also funded by Mubadala.[52] Other education brands from the UK and Australia, including Heriot Watt and University of Wollongong, respectively, have also established campuses in Dubai.

• At the graduate level, business education remains a key strength of the UAE's positioning with global education brands. INSEAD (Abu Dhabi), London Business School (Dubai), and Hult University (Dubai), are some of the business schools with campuses in the UAE, enabling both full-time MBAs and certificate or executive programs. Outside of business, other graduate programs come from established names in education, such as Harvard University's medical school campus in Dubai.

• These programs raise both the potential for strong foundational education in the region, as well as create opportunities to gain entrepreneurship skills. The presence of world-class undergraduate programs from global brands in education reduces the need for top performers to travel abroad to obtain top degrees. Similarly, business professionals in the UAE looking to improve their skills need not enroll in a top program outside the country to get a globally-recognized MBA or certificate.

• In addition to global brands, the high number of technical universities in the country including Khalifa University, United Arab Emirates University, and the 17-campus Higher College of Technology (HCT) provide STEM focused education to a wide number of both local and international students, with several programs offering computer science and engineering degrees that form the basis of technical skills for young tech companies.

• Given the presence of global brands in university and business education, a high number of technical universities, and increasingly strong local university names, the foundations for tech entrepreneurship skills are quite high. However, the young nature of these programs (few were established prior to 2005) mean that the gains from these programs are likely to only be felt over time.

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48. Emirates 24/7. "New course compulsory at all UAE universities from Jan 2016". http://www.emirates247.com/news/emirates/new-course-compulsory-at-all-uae-universities-from-jan-2016-2015-11-18-1.610985 (accessed December 19, 2017)

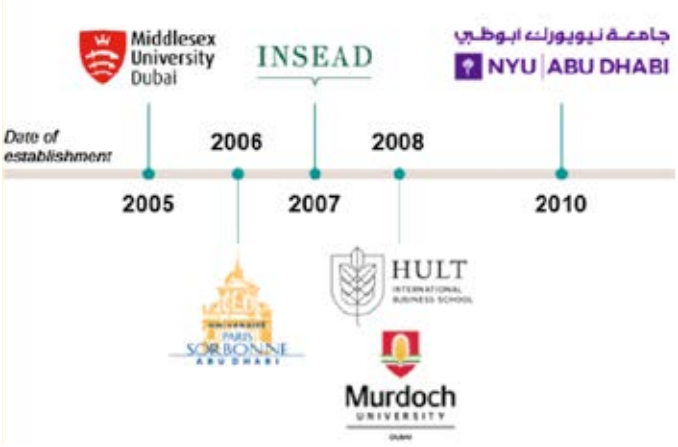
49. Youth Business International. "Creating a buzz about entrepreneurship in the UAE". https://www.youthbusiness.org/creating-a-buzz-about-entrepreneurship-in-the-uae/ (accessed December 20, 2017)

50. Khaleej Times. "UAE to create 1 million Arab coders, offer $1m in incentives". https://www.khaleejtimes.com/news/government/uae-to-create-1-million-arab-coders-offer-1m-in-incentives- (accessed December 20, 2017)

51. Gulf Business. "$1bn New York University Abu Dhabi Construction Completed". http://gulfbusiness.com/nyu-abu-dhabi-construction-completed/ (accessed December 20, 2017)

52. Mubadala. "Paris-Sorbonne University, Abu Dhabi ". https://www.mubadala.com/en/what-we-do/real-estate-and-infrastructure/paris-sorbonne-university-abu-dhabi (accessed December 21, 2017)

Figure 7. Campuses of acclaimed schools



Source: OC&C analysis based on university websites

Overall, employment costs and the early-stage nature of the tech talent pool encourage many UAE startups to source tech talent from nearby markets such as Egypt and Jordan

- Although the governments of several emirates have invested to improve the tech and coding skills of the local population, most of these initiatives will take time to be fully realized. In addition, many of the local citizens that are targets for these programs are positioned to be founders rather than support staff, possibly creating a long-term gap in some roles.
- The UAE, as an expat market, is rich in business talent but less so in tech talent. Nearby markets such as Jordan (Amman) and Egypt (Cairo) remain key source locations for high-quality tech developer talent, similar to how many tech companies in Western Europe turn to countries such as Belarus, Russia, and the Ukraine for access to developers at lower prices.
- The UAE's relatively higher living costs are one of the larger factors driving the outsourcing model for many tech companies that use remote software developers in Jordan and Egypt. Given the administrative ease of bringing these workers to the UAE, most entrepreneurs are constrained only by the high cost of living and related costs of employing foreign workers.
- As a result of this activity, Jordan and Egypt have grown to create back office support for UAE tech companies and others across the region, although most entrepreneurs use personal or professional networks to source their outsourced teams.

The UAE's attractiveness as a hub for big business has meant it is home to a large number of professionals with strong business skills, many of whom have entrepreneurship aspirations.

- The UAE's position of as a regional hub for multinationals has meant that there are a high number of highly skilled professionals in the country, many with general business backgrounds or with expertise in important sectors in the country, including energy, real estate, finance, media, and retail. Many management consulting firms maintain large offices in the UAE, and alumni from these offices have gone to found some of the country's largest tech companies including Careem and Namshi. Large tech companies such as Google, Microsoft, IBM, and Facebook also maintain a presence in the country, although the engineering staff is typically located elsewhere.
- The high numbers of business schools in the country have also provided an opportunity for local professionals to improve their business skills.
- Despite the number of professionals in the country that could serve as an entrepreneur talent pool, visa requirements mean that most of these professionals would have to resign and formally register a business idea to have the appropriate immigration.

> "I think finding top talent available to join a startup is a challenge everywhere globally, and this is particularly the case here in Dubai. Since the vast majority of the workforce is comprised of expats and they are only able to live in the country when sponsored on a residency visa by their employers, startups do not have a large pool of freely available talent beyond the relatively small local population. That said, the benefit of locating a business in Dubai is that startups can recruit from just about anywhere globally and sponsor their employees locally through a very easy process."
>
> ***Muhammed Mekki***,
> *Founding Partner, AstroLabs*

Figure 8. bitoasis – the digital currency exchange platform of the middle east

BitOasis

BitOasis is a digital currunency wallet and exchange platform dedicated of Middle East. The exchange service are available for GCC countries, yet the wallet can be used anyone in MENA region. BitOasis aims to change the transaction habits within the region and ease the payment given dominance of cash payment the region

Networks; The founders met at a tech event in the Silicon Valley, and decided to teki their idea to next level.

Skilled Talent; The "tech-savvy guys" of BitOasis are located in Czech Republic, due to lack of suitable in Dubai.

Regulations; Regulatory compliance is important in the UAE to maintain smooth operations, especially for fintech startups.

BitOasis Journey

"I think what we lack in Dubai is organic, bottom-up type tech meetups. When those networks organically grow that is where you see the real spike happening. When you have things run top-down it is not real anymore. Right people are not attending because they are not so passionate about it"
Ola Doudin, Co-founder - BitOasis

"Main challenge for us is maintaining a tech team. We couldn't really find anyone in Dubai. There are developers but you don't have these very specialized tech talents to support the requirements we have. We had to base the team in Czech Republic"
Ola Doudin, Co-founder - BitOasis

"Fintech is an industry where you need to hire a lawyer as soon as possible before building a product here, because you really need to understand grey areas. This fact also surgesup your startup costs"
Ola Doudin, Co-founder - BitOasis

Source: CNN, Crunchbase

3. Networks

Tech entrepreneurship ecosystems function best when there is a dense array of players and structures with strong relationships between them. This helps entrepreneurs exchange ideas, build teams, get the resources they need, and grow.

The UAE's sustained focus on government interventions into entrepreneurship has meant that the country has an exceptionally high number of ecosystem players, including incubators and accelerators, government programs, funds, special initiatives, and university programs.

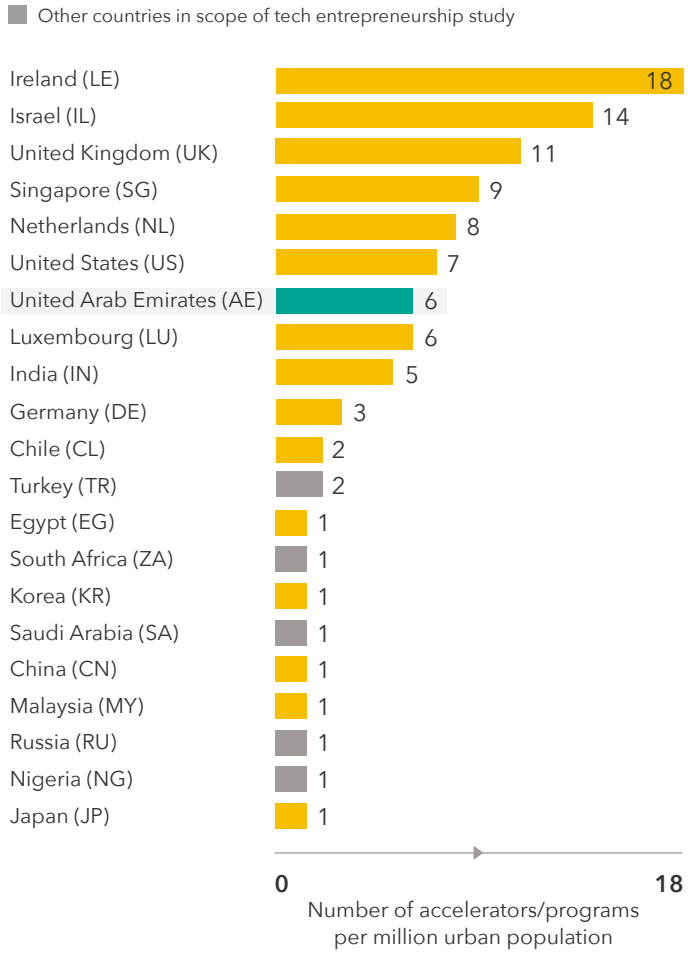
A recent commitment by the UAE government and the governments of the emirates means there is a high amount of well-financed activity for tech entrepreneurship, and innovation is a cornerstone of the government and social development agenda

• One strategy to raise the profile of the local tech startup ecosystem has been to attract global brands in tech accelerators to the country, to conduct programs in the country.
- Egypt's highly successful Flat 6 Labs debuted in Abu Dhabi's twofour54 free zone campus.
- American government services sector incubator 1776 completed its first cohort in 2017.
- American incubator network Techstars also debuted in Dubai in 2017.

- Abu Dhabi Global Market's (ADGM) planned launch of an Innovation Center in partnership with Silicon Valley accelerator brand Plug and Play will focus on driving FinTech.[53]
- Global social venture program and workspace Impact Hub has also been operating in Dubai for some time.

• Apart from global brands, local initiatives have received strong support from government entities particularly in the free zones.
- Astrolabs, supported by Google, IBM, and Amazon, featured strong support from its free zone authority Dubai Multi-Commodities Center (DMCC).
- In5 is the resident incubator of Dubai Internet City, located in close proximity to global tech companies including IBM, MasterCard, Visa, Google, Facebook, and others.

Figure 9. Accelerator density



Source: F6S, OC&C analysis

• At the university level, the commitment to tech entrepreneurship spans both curricula and incubation. These programs receive a high level of support in the form of mentors from around the world, sponsored attendance at conferences, and even mission trips to Silicon Valley.
- Stanford faculty have been retained to teach and develop venture design for the nationwide university entrepreneurship program.
- Entrepreneurship classes are mandatory, and many universities, especially technical ones such as UAEU and HCT, feature incubators for students, alumni, faculty, and even outsiders.
- American University of Sharjah's Sheeraa incubation program draws teams from around the world.

• Due to the early nature of many of these programs, the benefits will most likely emerge only after some time

53. Abu Dhabi Global Market. "Abu Dhabi Global Market Announces 1st Fintech Innovation Centre And Accelerator Partnership With World's Largest Startup Accelerator At The Inaugural Fintech Abu Dhabi Summit" https://www.adgm.com/mediacentre/press-releases/abu-dhabi-global-market-announces-1st-fintech-innovation-centre-and-accelerator-partnership-with-world-s-largest-startup-accelerator-at-the-inaugural-fintech-abu-dhabi-summit/ (accessed January 16, 2017)

The UAE has created several unique, forward-looking initiatives designed to shape the long-term future of the country

• In addition to the high number of government sponsored or supported incubators, the UAE is also remarkable for the very forward-looking initiatives and programs that are designed to define the country's future in the very long term, as measured in decades and even generations. Many ecosystem participants feel that the UAE's system of government lends itself well to this type of long-term planning.

- The Dubai Future Foundation and the related Dubai Future Accelerators is designed to carry out the long-term Future Agenda of the Dubai Government.

- Area 2071 is an initiative designed to make the UAE the world's leading nation for global impact in a range of high-impact global issues such health, food security, and word poverty.[54]

- The Mars Scientific City, a USD 140m project dedicated to researching how to settle Mars by 2117. [55]

The diverse nature of the tech ecosystem means that locals and expats are largely served by distinct sets of programs

• A number of services available to entrepreneurs target either the local population or are open and agnostic to country of origin. For many startups, this means they face different sets of options for services to launch and scale their businesses.

• Dubai SME, Khalifa Fund, and entrepreneurship programs in the secondary schools are all large-scale initiatives aimed at the local population of citizens and provide support and funding for their ventures. R&D initiatives targeted at citizens include Dubai SME's Hamdan Innovation Incubator, and AbuDhabi Department of

Figure 10. State-sponsored innovation initiatives innovation initiatives

	Program	Time span
مسرعات دبي المستقبل DUBAI FUTURE ACCELERATORS **Dubai Future Accelerator**	Intensive 9-week program that matches tech startups/companies with goverment agencies to create transformational solutions. In the first cohort, Dubai has invested USD 32 million to 19 participants	5-15 years
2071 **Area 2071**	A center of innovation that gathers the entire spectrum - entrepreneurs, investors, public/ private stakeholders, researchers and thinkers to solve global challenges	50 years
Mars Scientific City	A futuristic project worth USD 140 million that involvesspace research and colonization possibilities in Mars in particuler by 2117. The first space project of an Arab nation	100 years

Source: Dubai Future Accelerators, Area 2071, BECO Capital, Gulf News, Startup, Arch Daily

54. Area 2071. "Our Vision". https://www.area2071.ae/our-vision/ (accessed December 21, 2017)

55. The National. "City dedicated to researching Mars colonisation unveiled at UAE Government Centennial meeting". https://www.thenational.ae/uae/government/city-dedicated-to-researching-mars-colonisation-unveiled-at-uae-government-centennial-meeting-1.661843 (accessed December 21, 2017)

Economic Development's Takamul program, which supports and funds Emirati inventors, universities and companies in the protection and commercialization of their innovations.[56]

- These initiatives target growing the tech entrepreneurship of the local population and creating a highly skilled tech workforce in the long term.
- Programs centered in the free zones are nationality agnostic and attract a high number of foreign entrepreneurs. These incubators are often funded by the free zone authority itself and open to all entrepreneurs. Beyond incubators and innovation hubs, R&D centers in these free zones include Dubiotech, smart city project Masdar City, technopark Dubai Silicon Oasis (DSOA), Dubai Design District (D3), and Dubai Internet City.

The rich number of programs, activities, and incubators across the emirates is impressive, although no central authority oversees or monitors the net result of activity

Many of the government-led incubators, accelerators, programs and innovation hubs that exist across the emirates are run outside the monitoring of a central authority.

- This lack of a central authority, either at the federal or emirate level, may mean that the coverage by sector and stage of young tech companies may create gaps or mismatches, and may prevent a central monitoring of the total amount of activity.

> "Community groups like Wamda, N5 and DFA are there to seed that community and build a network around entrepreneurs."
> ***Ramzy Ismail**, Director, Techstars Dubai*

56. Al Tamimi & Co. "R&D and Innovations in the GCC Countries: Recent Updates". http://www.tamimi.com/law-update-articles/rd-and-innovations-in-the-gcc-countries-recent-updates/ (accessed December 21, 2017)

4. Culture

Cultural expectations and perceptions of entrepreneurship guide entrepreneurial behavior and the level of support from the community. Culture also affects when and whether citizens choose to engage in entrepreneurial activity. Generally, in cultures that support entrepreneurial behavior [57]

- People seek 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 preference for communal identification and adherence to social norms and rules.
- Society is highly competitive, celebrating achievement, leadership, and assertiveness traits. People expect to be rewarded materially for success.
- People in entrepreneurial cultures feel comfortable with uncertainty and ambiguity. There is more acceptance of nonconformist behavior and ideas designed to overcome challenges rather than maintain the status quo.

The UAE's long history as a trading port and cosmopolitan meeting point has meant that there is an entrenched culture of entrepreneurship in the country. Although the modern economic structure of the UAE relies more heavily on larger, established companies, the entrepreneurial spirit is still present in the high numbers of immigrants and guest workers.

Figure 11. *Careem - The first "unicorn" of the UAE*

Careem

Founded in 2012 by two ex-management consultants, Careem has become a huge success and surpassed its main global competitor, Uber, in its region

6M	150 K	13	571 M
users	drivers	countries	funding

- Careem's success is sourced from a combination of being first in the market, local knowledge and homefield advantage. In a region where addresses are not always reliable, Careem built its own mapping system to offer accurate service
- Careem has raised USD 571 million across 6 funding rounds. Daimler, Rakuten, Abraaj Group, STV Ventures and Wamda Capital are some of the investors. As a result of funding rounds, Careem is worth over USD 1 billion, and it is currently the only unicorn of the UAE
- The company collaborates with the regulators and responsive to the regulatory changes. They signed a deal with Roads and Transport Authority of Dubai to have full-fledged operations, and hired women drivers in Saudi Arabia right after they became eligible to drive by law.

Source: CNN, Crunchbase

The local culture incorporates some of these elements but also keeps to more traditional values that are similar to other cultures of the region.

• The high power distance of the local culture makes people respect authority, and demonstrate a high tolerance for social inequality. [58]

• Strong cultural mores are reflected in a highly collectivistic society, and people are expected to conform to cultural rules rather than demonstrate individuality. Similarly, unorthodox activities or behaviors are not valued if they go against cultural norms.[59]

The UAE is a unique mix of different cultures from around the world, contributing to a tech ecosystem that is largely supportive of tech entrepreneurship

• At more than half of the population non-citizens, the unusual demographics of the UAE make it one of the most diverse countries in the world, particularly in large and cosmopolitan cities Abu Dhabi and Dubai. With a resident population that comes from all over the world, the culture has grown to a mix of Arab, Asian, and western populations. Given the newness of the country, the culture has been formed around these diverse perspectives, and in line with the national culture of the country.

• For Emirati entrepreneurs, the cultural preference for social cohesion and following norms mean they may need to embrace the culture of the many guest workers to develop the kind of innovation and disruptive business activities that are required for tech entrepreneurship.

• Abu Dhabi and Dubai's highly ambitious projects, announcements, and investments have in turn translated into a culture that embraces the same risk-taking and ambitious spirit. Ecosystem participants point out that the rapid growth that Abu Dhabi and Dubai have seen, coupled with impressive forward-looking accomplishments and unprecedented achievements help shape a culture that suggests an anything-can-happen attitude.

• Entrepreneurs see opportunity everywhere, both in building the foundations of the country's private sector as well as creating regional or even global brands.

Although most in the tech entrepreneurship ecosystem embrace the experimentation required of innovation, the larger business community can be failure averse

• The risk-embracing nature of the tech entrepreneurship ecosystem isn't always matched by the business culture of the wider private-sector environment, in part due to a heavy reliance on large, established private-sector companies.

• Ecosystem participants point out that historically, private-sector businesses focused on tangible assets, inventory, and traditional goods and services. Technology, with its intangible asset value and unpredictable development trajectory, is out of line with the businesses that formed the initial business culture.

• As a result, risk-aversion, low-trust environments, and a reliance on personal networks for business deals is common among non-tech small business owners as well as executives at established businesses.

• The implications for young tech companies are a lower willingness to experiment with or support newer technologies, until their reliability and worth has been clearly demonstrated by a reputable player.

• As a result, startups can struggle to find customers for pilot projects and trial services. This is particularly pronounced in some sectors: in digital health, restrictions and risk-aversion by providers have created very high barriers for health startups that need large partners to execute trials and pilots

The cosmopolitan, liberal yet well preserved set of rules make the UAE, and particularly Dubai, attractive to talent from all over MENA region and beyond

• The UAE has become a haven for immigrant workers from around the world, ranging in skill levels and reasons for migration.

• Like Singapore, the government has pushed to create the legal and social framework for a highly tolerant society, where different cultures, faiths, and backgrounds are welcomed and respected.

58. Hofstede Insights. "Country comparison". https://www.hofstede-insights.com/country-comparison/the-united-arab-emirates/ (accessed December 21, 2017)

59. Gulf News. "45 free zones in the UAE: Find the right one for your new business". http://gulfnews.com/guides/life/community/45-free-zones-in-the-uae-find-the-right-one-for-your-new-business-1.1716197 (accessed December 21, 2017)

• This liberalism has been balanced against a legal system based on Sharia law, and established norms designed to protect the rights and culture of the local population and the status of the Muslim religion.

• For MENA citizens, particularly those who are ethnic or religious minorities in their own countries, the UAE represents the freedom to practice their religion and cultural traditions.

• Further, the growing appeal of the lifestyle and amenities of the UAE, and especially Dubai, has made it an attractive target for highly skilled professionals who want affordable luxury and Western-style freedoms.

The visa system of the UAE means that most entrepreneurs are more mature and established than young and experimental, favoring business ideas that reflect long experience over disruptive innovation

• Among expats in the UAE, few are fresh graduates or early-career professionals. This is mainly due to employment visa requirements for foreign professionals, a cost which tends to skew the expat workforce older and more established. Ecosystem participants highlight that an older, established private-sector workforce sometimes means that the ideas that emerge are more likely to reflect long-term professional experience rather than disruptive innovation. Ideas that target the very young or are more experimental in nature are less common, in favor of iterations on established tech business models such as E-commerce.

• In contrast, the high numbers of graduates of the technical universities are more likely to be Emirati or from nearby countries. For fast-growing companies, experienced talent is typically sought from abroad rather than sourced as fresh graduates from local universities. This may mean they have difficulty finding the kind of early-career work that helps build critical skills.

> "To say 'Middle Eastern culture' is a generalization. Every country is different from each other. Even within UAE Dubai culture is pretty different from Abu Dhabi."
> ***Ola Doudin**, Co-Founder and CEO, BitOasis*

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), sources of innovation (R&D), and international trade opportunities (Trading across Borders).

The UAE is a relatively young country, and the emirates and federal government entities are working quickly to align the regulatory framework to the needs of the existing and expected business environment. At times, this means that changes are in process that are targeted at business environment improvements, but have not yet made an impact.

A. Business procedures

The ease of executing business functions drives, in part, how many startups can be launched and survive. Straightforward 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 in time and cost, 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 framework can be a significant motivator or deterrent to starting a business.

The requirement to rent office space, in addition to setup costs related to the trade license and employment visas brings forward the first-year operating costs of a young company and may constrain growth due to links to employment visas

- In the UAE, setting up a business as a foreigner (with 100% ownership) is permissible in one of the country's many free zones.[59] The process involves securing a trade license for a fee, applying for employment visas for any foreign staff (including founders), as well as renting office space. The office space rental requirement stands out as unique in the country, given that most ecosystems only require business and immigration documentation to operate.
- The requirement to rent office space may create additional costs for young companies that are too small to justify formal offices. In other ecosystems, the 'garage model' of working from informal spaces until the business can justify operational expenses is common.
- The office space requirement may be front-loading key expenses that startups require to launch. For entrepreneurs just starting, the total costs can reach USD 17,000 in required first-year capital.

Figure 12. Sample cost analysis of setting up a business in a free zone

	Cost Bracket	Fee (AED)	Fee (USD)
One-time costs	Freezone company formation	17,500	4,765
	Name approval and notarization	4,995	1,360
	Examination and clearance	590	161
Recurring costs (per year)	Rent (50 sq. ft.)	7,500	2,042
	Insurance and ID card	670	182
	Freezone visa free	5,000	1,361
	Registered agent free	6,000	1,634
	ICT plan (estimated)	4,000	1,089
	Total setup cost	**46,255**	**12,595**
	Running cost (per year)	**23,170**	**6,309**
	Minimum bank balance	16,000	4,357
	Total cost for the first year	**62,255**	**16,952**

- The costs above are provided only for entrepreneur. **They do not cover salaries of employees**, which should be **AED 10,000 minimum** on average.
- **Medical examination, police clearance, ID card and visa** costs be considered for each additional non-GCC employee, witch is around **AED 6,000**
- For each employee hired, the enterprise owner should **deposit 1.5 months of salary and one way ticket**, which is **AED 16,000**
- Although setting up a business costs higher than some markets, **obtaining a visa and starting the business is significantly faster** than many developing/developed countries. **Full foreign ownership also sets the UAE apart from other Gulf states.**

a. Name approval and notarization costs include name approval, typing of Memorandum of Association and its notarization
b. Examination and clearance refers to medical examination and police clearance
c. Insurance and ID card includes annual medical insurance and Emirates ID card costs

Source: OC&C analysis based on Shuraa, Visaprocess, Emirates 24/7, Mitula, Rizmona, Government.ae, Du, Glassdoor

59. Gulf News. "45 free zones in the UAE: Find the right one for your new business". http://gulfnews.com/guides/life/community/45-free-zones-in-the-uae-find-the-right-one-for-your-new-business-1.1716197 (accessed December 21, 2017)

As an 'expat market', visas are required for most staff in tech companies, a process that's in turn linked to administrative requirements and the amount of office space that's rented. This may be presenting constraints for fast-growing companies

• In addition to requirements to rent office space, the number of employment visas available to a young company is linked to the office size that has been rented. For many companies this is in line with their staffing needs, but for other companies this may affect their hiring growth, preventing some startups from allowing staff to work in informal environments such as from home or at hubs.

• By extension, slower growth affects the job creation opportunity presented by tech entrepreneurship. Successful companies require and rent increasing amounts of office space as they grow and scale.

• E-commerce players also set up warehouses and sizable office spaces as they hire and grow as well. Yet at the lower end of the tech ecosystem, many startups may be renting office space months or even years before they require it to support operations. This may affect not just which entrepreneurs can get started but also how quickly they can scale up by bringing in the right talent.

Trade license requirements for young companies require that they have a finalized view of business activities, which may be difficult for young startups that are still proving their business model, or young companies whose activities combine different elements

• Trade licenses are allocated based on planned business activities, and often are narrowly defined in line with the core part of the business. For non-tech entrepreneurs launching small businesses, perhaps in line with their previous experience, the wide number of available trade license types provide enough breadth and choice to accommodate most new business starts.

• Young tech companies may face specific challenges related to matching intended activities to the range of available options. Further, some truly innovative ideas don't fit neatly into a single license, or may crisscross different activities.

- i.e. at the time of its acquisition, UAE E-commerce giant Souq.com featured an online retail business, online payments via its acquisition of gateway PayFort, and a delivery fleet. Though in a single line of business by most standards,the multiple parts would have required different trade licenses.

• Young companies selecting a trade license may find that business model pivots come at a higher cost than they would otherwise. Adding licenses or changing one a business model has been refined is a common practice, but adds to the early operating costs.

New free zones that mirror offshore best-in-class jurisdictions such as British Virgin Islands and Cayman Islands represent a significant opportunity to attract UAE registrations

• Free zones located in the financial centers of Dubai and Abu Dhabi have been positioned as legislative havens to provide local entrepreneurs and businesses the assurance of an internationally sound legal framework.

- The Dubai International Financial Center (DIFC) free zone operates an independent common law judiciary and court system, with a regulatory framework closely modeled on English and Welsh common law.[60] The regulatory infrastructure is seen as particularly effective for the many financial institutions, funds, and other companies registered in the free zone that seek to be regulated as they are in other global financial hubs.

- The new free zone Abu Dhabi Global Market (ADGM) will similarly match an offshore jurisdictions of British Virgin Islands and the Cayman Islands, with a legal framework that is an exact copy of English common law and is designed to appeal to entrepreneurs and entities that register entities in offshore jurisdictions. The nature of the similarity means that previous cases can be used to establish applicable precedent with the ADGM.[61] However, ecosystem participants believe it will still take some time for residents to get comfortable with the processes and decisions of the new jurisdiction.

Recent insolvency reforms are likely to stimulate entrepreneurship by making it easier for entrepreneurs to remain in the country and protect insolvent companies from facing criminal prosecution

• In line with other countries in the region and as part of anti-fraud mechanisms, strict bankruptcy laws have been in place that mean that some types of financial failure can trigger criminal prosecution. Because of the high number of foreign workers and the relatively liberal business environment, the emirates of the UAE seek to prevent fraudulent business and financial activity by foreign workers who then flee prosecution by leaving the country.

• Unfortunately, ecosystem participants point out that laws have historically affected entrepreneurs who face cash flow or other liquidation events beyond their control. Due to the nature of tech startups being highly risky and with delayed return potential relative to their non-tech counterparts, these laws have been a considerable challenge for entrepreneurs that want to take the risks needed to build and scale up their business.

• Newly-introduced reforms reduce the likelihood of criminal prosecution in the event of checks written against insufficient funds, insolvency or bankruptcy.[62] Particularly welcomed is the removal of the 'bankruptcy by default' provision. Court-led insolvencies are shielded from criminal prosecution, and provides incentives for business owners facing financial difficulties to come to a non-court resolution.[63]

60. Clyde&Co. "UAE: Choice of governing law and jurisdiction ". https://www.clydeco.com/insight/article/uae-choice-of-governing-law-and-jurisdiction (accessed December 21, 2017)

61. Mondaq. "United Arab Emirates: Abu Dhabi Global Market: The Application Of English Common Law". http://www.mondaq.com/x/443912/Contract+Law/Abu+Dhabi+Global+Market+The+Application+Of+English+Common+Law (accessed December 21, 2017)

62. KPMG. "Bankruptcy law". https://home.kpmg.com/ae/en/home/insights/2016/12/uae-bankruptcy-law.html (accessed December 21, 2017)

63. Khaleej Times. "Why UAE's new bankruptcy law is a boon for business ". https://www.khaleejtimes.com/business/economy/uae-bankruptcy-law-boom-bust-bonanza (accessed December 21, 2017)

The UAE, along with KSA among GCC countries, introduced VAT at 5% in January 2018, the first official tax collected in these previously 'tax-free' countries

• Although the tax will raise prices on nearly all goods and services, some ecosystem participants welcome the move given the proposed impact on financial discipline on companies that previously never had to maintain or report financials or proper accounts.[64]

B. Digital policies

The benefits of the Internet economy are enormous but also bring 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.

Overall, strong IP and cybersecurity laws create the necessary protections for safe use of the Internet. Other Internet regulations are in line with global standards for privacy, safety, and fairness.

Restrictions on freedom of content and expression are regarded as in line with the needs of cultural sensitivity, are perceived as a simple business convention in the region, and therefore don't possess much of a limitation on most tech companies

• There are few policies that restrict Internet content or use in the UAE. Most are related to content and expression rules, such as restrictions on defamation against another individual, company, or entity such as the government. In line with other countries in the region, topics garnering further restrictions include the royal families, religion and some aspects of government. While free and unfettered speech is not permitted in the UAE as it is in the West, few tech entrepreneurs see this as a barrier to doing business.

• Instead, most entrepreneurs find the restrictions in line with cultural sensitivity and respectful interactions that are common to any interactions in the region.

Disruptions in Voice over Internet Protocol (VoIP) applications are hurting technology startups that that leverage globally adapted communication channels to manage their cost bases

• The Telecommunications Regulatory Authority classifies VoIP as a "regulated activity" to be provided by licensed operators, urging international companies providing such services to work with regulated service providers in UAE and get licensed.

• In addition to cost considerations, the slowdown of global services are affecting the international connectivity of tech entrepreneurs whose counterparts abroad are not using UAE domestic service solutions.

64. PwC. "UAE: MoF has published the Value Added Tax (VAT) law on its website". https://www.pwc.com/m1/en/services/tax/me-tax-legal-news/2017/mof-published-vat-law-website.html (accessed December 21, 2017)

C. Government 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.

The UAE government has committed to increasing the public and private-sector R&D spend, targeting universities and public-private partnerships

- At 0.9% of GDP in 2015, the UAE's spending on R&D is low for a country at its level of development. The government has identified R&D spending as a national priority, and planned to triple its level of spending between 2015 and 2021.[65] To increase total public spending and involve the private sector, the UAE has demonstrated preference for public-private partnerships, often via the large sovereign wealth funds such as Abu Dhabi's Mubadala. These projects have become a successful model to stimulate investment and launch projects rapidly. Given government revenues affected by changes to the global oil price, these partnerships fill a gap while reducing government spending.[66]
- Partnerships between the government or a sovereign wealth fund, universities, and private-sector entities bridge the gap between market requirements and existing R&D infrastructure. Mubadala launched the Aerospace Research and Innovation Center (ARIC) in 2006 as a partnership between the fund, technical institution Khalifa University, and aircraft manufacturing giant Boeing. The facility includes aerospace R&D, manufacturing, assembly, and maintenance activities. [67]
- An R&D center or institution focused on sector-specific research and development is a key part of several UAE free zones, including smart city megaproject's Masdar Institute of Science and Technology, Dubiotech, and Harvard Medical School's R&D center in Dubai Healthcare City.[56]

The UAE Cabinet recently published a framework for public-private partnerships that sets out clear guidelines for how the private sector can interact with the government and regulates PPP agreements. The move is designed to stimulate interest in PPPs as well as broaden the mechanisms by which they can happen, and joins Dubai's own PPP law passed in 2015.[68]

65. The National. "UAE to boost 'knowledge economy' jobs with tripled spending on research and development". https://www.thenational.ae/business/uae-to-boost-knowledge-economy-jobs-with-tripled-spending-on-research-and-development-1.96491 (accessed December 22, 2017)

66. Arabian Business. "UAE aims to have public-private partnerships framework by year-end". http://www.arabianbusiness.com/uae-aims-have-public-private-partnerships-framework-by-year-end-652123.html (accessed December 22, 2017)

67. Mubadala. "His Highness Sheikh Hamed bin Zayed Al Nahyan Attends a Signing Ceremony to Establish AED 55 million Aerospace Research Center ". https://www.mubadala.com/en/news/his-highness-sheikh-hamed-bin-zayed-al-nahyan-attends-signing-ceremony-establish-aed-55-million-aero (accessed December 22, 2017)

68. Arabian Business. "UAE aims to have public-private partnerships framework by year-end ". http://www.arabianbusiness.com/uae-aims-have-public-private-partnerships-framework-by-year-end-652123.html (accessed December 22, 2017)

D. Trading across borders

The GCC has a Customs Union in place designed to harmonize regulations, although differences in interpretation exist that young tech companies must manage

• In 2015, the six members of the Gulf Cooperation Council approved the framework for a Customs Union with a common external tariff of 5%. The agreement also features:

- A single point of entry for imported goods, and with customs duties paid only once at the port of entry.
- No tariffs on goods produced in GCC member states.[69]

• In addition, the GCC agreed a VAT of 5% which went into effect in UAE and KSA on January 1, 2018.

Despite these guidelines, some ecosystem participants have experienced differences in how they are implemented, particularly the procedure for claiming back external tariffs.

6. ICT Infrastructure

Widespread coverage of high speed Internet at affordable prices reflects the ability of the ecosystem to support rapid knowledge sharing and dissemination of new technologies to the wider population. It also highlights the ability of the wider market to consume tech-enabled products and services.

Cloud services allow businesses, especially tech startups, to reduce 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.

Moreover, studies indicate that increased access and usage of cloud computing services positively correlates with the level of innovativeness of a country.

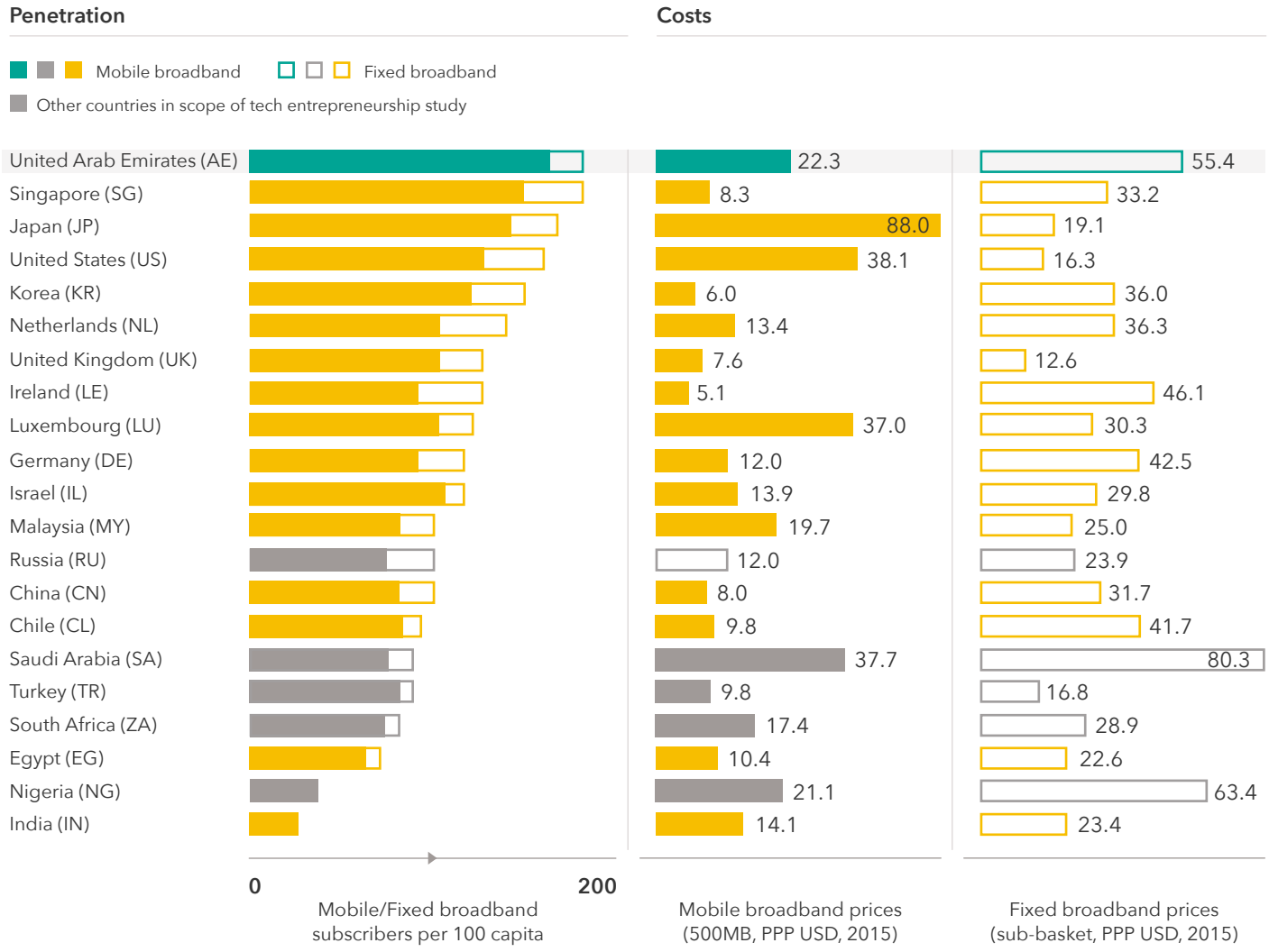
UAE's ICT coverage is particularly high, and it remains one of the best in the MENA region. High-profile projects such as the AED 330m (USD 90 million) project to provide broadband to 268 Abu Dhabi schools reflects the government's commitment to coverage and speed.[70] The UAE is ranked number one globally for smartphone use, providing a solid foundation for young tech companies that provide or rely on smartphone apps. [71]

69. EIU. "GCC customs union up and running". http://country.eiu.com/article.aspx?articleid=902649474&Country=Qatar&topic=Economy&subtopic=Forecast&subsubtopic=External+sector&u=1&pid=121764996

70. UAE Today. "ADEC And Etisalat Accomplish The ICT Infrastructure And Technical Support Project Across Abu Dhabi Public Schools". http://www.uaetoday.com/news_details_ad.asp?newsid=9692 (accessed December 22, 2017)

71. The National. "UAE's global top spot in smartphone use gives local SMEs huge opportunities". https://www.thenational.ae/business/technology/uae-s-global-top-spot-in-smartphone-use-gives-local-smes-huge-opportunities-1.175824 (accessed December 22, 2017)

Figure 13. mobile/fixed broadband penetration and costs



Note: The broadband sub-basket refers to the price of a monthly subscription to an entry-level broadband plan
Source: International Telecommunications Union, Euromonitor, OC&C analysis

The government's commitment to smart government and e-government services has even created one of the most ambitious e-government projects which will use leading-edge drone and cloud technologies to provide lower-cost services to its citizens. Dubai has hired the government of Estonia, a world leader in e-government services, for this purpose.[72] Other projects, such as an AED 700 billion (USD 190 billion) contract betweenEtihad Airways and IBM on cloud services reflects the intentions of the private sector to use this service. [73]

72. Gulf News. Why Dubai is looking to Estonia to develop a digital city".http://gulfnews.com/business/economy/why-dubai-is-looking-to-estonia-to-develop-a-digital-city-1.1603874 (accessed January 2, 2018)

73. ETIHAD. "Etihad Airways signs US 700 million technology services cloud collaboration with IBM to transform global operations". https://www.etihad.com/en-us/about-us/etihad-news/archive/2015/etihad-airways-signs-us-700-million-technology-services-cloud-collaboration-with-ibm-to-transform-global-operations/ (accessed December 22, 2017)

The UAE's ICT infrastructure is one of the best in the world, although a limited number of restrictions such as VOIP and VPNs may be impacting some tech companies that rely on these services

• Well-developed ICT infrastructure remains a top benefit of operating in the country, particularly in comparison to nearby regions and countries where entrepreneurs face unreliable ICT and other infrastructure services, such as in Lebanon which frequently experiences blackouts.

• Increasingly, public WiFi zones are being rolled out across the UAE, with free public WiFi available in selected neighborhoods and the public transportation system of Dubai. Coupled with near-universal in-home WiFi and high number of restaurants and cafes that offer WiFi, emirates such as Dubai have very high coverage that supports both technology development as well as consumption of Internet services.

• Broadband internet data plans are amongst the most expensive in the Gulf region, often related to the duopolistic nature of the UAE's telecom sector. For fixed line broadband, free zones are divided among the two telecom service providers resulting in less room for competitive pricing.[74]

• One area of particularly low coverage remains VOIP, the Internet-enabled telephone apps and services. Challenges accessing these services has meant that some startups are unable to use this low-cost communication method. For startups that feature international operations or rely on international customers, this can raise the cost of operations significantly.

> "ICT infrastructure here is definitely more than sufficient for startups"
> ***Tarek Ghobar***,
> *Startup Manager, 1776*

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 consumer protection and competition rules, by building public confidence in online services, and especially via procurement programs and policies.

The UAE's market size is larger than its population would suggest, given its unique demographics and number of highly consumptive high-net-worth individuals. UAE residents purchase more than USD 8 bn of luxury goods, which doesn't take into account tourist or visitor spending, and which puts it within the top 10 biggest luxury markets globally. [75]

With per-capita rates of Internet and smartphone use among the highest in the world, at 92%[76] and 81%, respectively, along with high disposable income rates, the country has become a target for marketing certain apps and services that rely on high smartphone use.

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74. Why you pay more for internet in the UAE", December 24, 2014, The National, www.thenational.ae/uae/why-you-pay-more-for-internet-in-the-uae-1.564155

75. "CNBC. "The world's biggest luxury markets in 2015". https://www.cnbc.com/2015/12/31/the-worlds-biggest-luxury-markets-in-2015.html?slide=3 (accessed December 23, 2017)

76. Internet Live Stats. "United Arab Emirates Internet Users". http://www.internetlivestats.com/internet-users/united-arab-emirates/ (accessed December 23, 2017)

As a relatively small country, many UAE tech companies need to target cross-border expansion to reach scale-up stage

• Like Singapore, the UAE is a compact market with high startup potential. Tech ventures that launch in the country can benefit from superior infrastructure, a growing economy, a cosmopolitan workforce, and a middle- and upper- income consumer class with high disposable incomes.

• However, UAE's population of c. 10 million, across a wide range of socioeconomic levels, suggests that fast-growing tech companies must look to the wider region for the market size that can support their ambitions. For some types of businesses that target the unique features of consumer or business culture in the UAE, the market can satisfy their aims. But most others, particularly in lower-margin ventures such as E-commerce, must look to tackling key large markets early on.

• Saudi Arabia's population of c. 32 million with a PPP of $50,400[77] and Egypt's population of c. 95m with a PPP of $10,300 [78], represent the most common near-term target markets for cross-border expansion. Others include the wider MENA region and even some parts of Asia, where many entrepreneurs may have cultural or professional connections.

• Large UAE scale-ups typically use investor funds to push an aggressive cross-border expansion, including Souq.com (USD 425m raised, four countries), Careem (USD 421m raised, 13 countries), Wadi (USD 67m raised, two countries), Fetchr (USD 52m raised, six countries), and Namshi (USD 33m raised, six countries). [79-80]

• The focus on early cross-border expansion often has implications for how entrepreneurs form and launch their businesses. One strategy cited by participants includes getting Saudi angel investors on board that can assist with market entry into the Kingdom.

Expanding into the wider MENA region requires dedicated market entry plans and offerings despite language and some cultural similarities

• In other parts of the world, the MENA region is often treated as a culturally and linguistically homogenous region. However, the sub-regions of the GCC, Levant, North Africa, and surrounding countries carry distinct consumer preferences, spending patterns, dialects, religious practices and cultures.

• For UAE tech companies looking to scale up abroad, challenges often begin with marketing, in striking the right tone and keeping to subjects and references that are culturally relevant and respectful. Scale-ups often employ in-market content creators or other operators to ensure that dialect and references and local market requirements are met. This increase in operations to deal with cultural and linguistic differences has an impact on the total cost of scaling.

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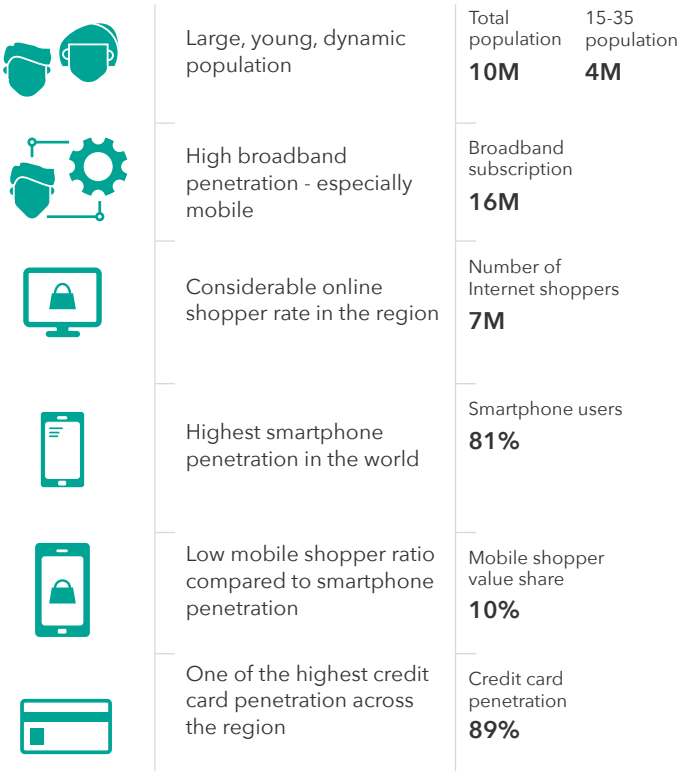
77. World Bank

78. Arab News. "Egyptian population stands at nearly 105 million ". http://www.arabnews.com/node/1170401/middle-east (accessed December 23, 2017)

79. Menabytes. "STC becomes the first in MENA to conduct successful 5G trials". http://www.menabytes.com/stc-5g-trials/ (accessed December 23, 2017)

80. Khaleej Times. " Dubai's Emaar buys Namshi stake". https://www.khaleejtimes.com/business/local/dubais-emaar-buys-namshi-stake (accessed December 23, 2017) www.menabytes.com/stc-5g-trials/ (accessed December 23, 2017)

Figure 14. Digital economy drivers



Source: Euromonitor, Statista, ITU, OECD, IMF

The UAE's strength as a hub for finance, media, content, tourism/hospitality, natural resources, and smart cities make it highly desirable to regional and international startups

• Dubai Media and Internet Cities, Abu Dhabi's content free zone twofour54, Abu Dhabi's thriving oil and gas industry, and Abu Dhabi's Masdar City/Dubai's Smart City initiatives, among other sectors, represent Large-scale projects and hubs for key sectors in the country.

- Dubai's achievement as an iconic travel has reated a hospitality industry that supports innovation in the sector, ranging from a big-data project between Emirates (Airlines) Group and Oxford University, to a business plan competition sponsored by Dubai Tourism[81], to a hospitality accelerator Marriott TestBED.[82]

• The sector specialization within the private sector has created two key benefits for tech startups in the country:

- Skilled professionals and senior executives in these strategic sectors are in high numbers, providing a good supply of mentors, advisors, investors, and executives, and partners for young tech companies in these sectors. This is helped by a porous exchange between large companies and startups.

- Expertise, personal networks, and proximity that facilitates partnerships, pilots, customers, and other interactions between large, established companies and smaller tech ventures

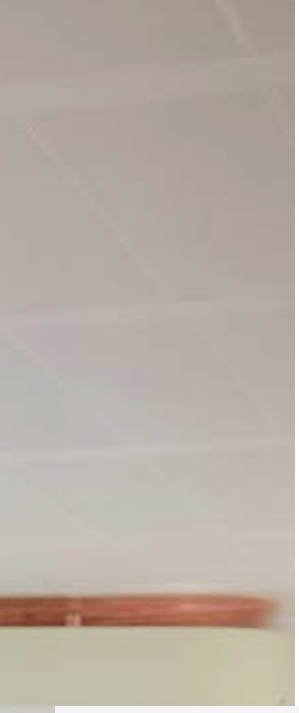
81. Arabian Business. "Dubai Tourism launches start-up competition for GITEX 2017"http://www.arabianbusiness.com/startup/377868-dubai-tourism-start-up-competition-for-gitex-2017 (accessed December 26, 2017)

82. Wamda. Mariott TestBED Middle East and Africa https://www.wamda.com/marriott-testbed-mea/about (accessed January 3, 2018)

Dubai is a major hub for the East. One of the reasons is geography. It is close to South-East Asia, Sub-Saharan Africa, and Eastern Europe. They have construction industry, smart city sector, FinTech which is a huge driver as well. Consumer technology is becoming a little bit saturated but there is a still large activity for enterprise based technology companies."

***Ramzy Ismail**, Director, Techstars Dubai*

Policy Playbook:
Recommendations designed to strengthen the tech entrepreneurship ecosystem



The UAE has invested an impressive amount of effort and funding in developing the tech entrepreneurship ecosystem, at the federal level, at the emirates level, and within free zone authorities. The investment has focused on helping the country achieve its Vision 2021of developing the private sector, reducing the country's economic dependence on oil revenues, and developing the social fabric by transforming into a knowledge economy. Three areas of focus have been identified:

Figure 15. *Policy recommendations designed to strengthen the UAE tech entrepreneurship ecosystem*

Financial capital | Skilled Talent | Networks | Regulations | Market Potential

Ease setup requirements and reduce operating costs

Develop a general-purpose Innovation Trade Lincense that allows tech companies to experiment while they finalize their business model

Create exemptions from the office space requirement that allow startups to operate for a defined period

Partner with incubators and accelerators to distribute free trade licenses and other public resources

Continue developing a regulatory structure that's conducive to tech entrepreneurship and operations

Ensure the new entrepreneurship visas are aligned with the unique needs of young companies and global talent

Create a Ministry of Innovation that unifies innovation and tech entrepreneurship efforts across ministries and emirates

Maintain focus on and publicize transparency in court cases in new jurisdictions to attract foreign investors and reassure local ones of the strength of the regulatory framework

Lead the creation of an entrepreneurship association that liaises between young tech companies and the goverment

Develop a program that targets growth-stage tech enterprises in the region and beyond to relocate to the UAE

Play a role in easing market access for tech entrepreneurs

Ease cross-border regulatory differences between the UAE and KSA

Form partnerships with chambers of commerce in target markets to create cross-border linkages

Open market development offices in key cities including Cairo, Riyadh and Amman

Ease setup requirements and reduce operating costs

Develop a general-purpose Innovation Trade License that allows tech companies to experiment while they finalize their business model

Trade licenses are tightly linked to planned business activities, requiring that entrepreneurs carefully select which license best matches their intended activities prior to launch. Given the experimental nature of early-stage entrepreneurship, the trade license can present a challenge to pivoting, or early changes to the business model. For other entrepreneurs, it may mean they delay registration until their business model has been proven, affecting how much they can communicate and market their solution. Early, tech-enabled startups are uniquely dependent on a flexible market offering, often crossing several established lines of business. For many startups, the cost alone of securing enough licenses to carry out planned creates a barrier to growth.

Creating an early-stage, general 'innovation trade license' would allow startups to quickly register and launch their business even during the experimental stage. Getting customers, partners, and suppliers in order to prove the business model, and make adjustments where necessary, would allow young startups to finalize their business model while remaining compliant.

Limiting the general innovation license to young tech companies would help prevent abuse by larger companies seeking to skirt regulations. To be effective, the department responsible for granting these licenses must be educated and knowledgeable about tech businesses and their requirements.

Create exemptions from the office space requirement that allow startups to operate for a defined period

The need to rent office space is a significant cost for many young tech startups. Easing this requirement by creating special exemptions will not only reduce the operating costs for young companies, but also enable them to scale up more quickly by hiring more people. In other countries, entrepreneurs operate young companies out of a garage until the operations and can be investor- or customer-supported enough to justify renting an office space. This encourages more experimentation and innovation as entrepreneurs find business models that work and product/market fit in a low-cost environment. Without the need for significant operational expenses, they are able to take longer to identify market-leading innovations. Young companies that are successful naturally grow to need additional office space to support their growing operations.

Partner with incubators and accelerators to distribute free trade licenses and other public resources

Several existing incubators and accelerators in the UAE offer free trade licenses to young startups that are part of their program. Others offer lower-cost, subsidized ones as part of arrangements with the relevant free zone authority, such as the incubator in5's relationship with the free zone Dubai Internet City. Few programs are run at the federal or emirates level. This may mean that the total number of trade licenses available is not necessarily monitored or controlled by a central authority, which may impact an emirate or the federal government's ability to shape the total number of registrations in line with its long-term vision. In addition, most programs offer this relief in line with the business services that they offer, which may mean that some startups 'fall between the cracks' if they are in need of trade license relief but don't qualify for the specifics of a free zone program.

A centrally-allocated program that distributes free or highly subsidized trade licenses via incubators or free zone authorities creates an opportunity to stimulate the total number of innovative new businesses. This program could have two parts: trade licenses offered at very low cost to young tech companies, and secondary licenses granted with minimal bureaucracy to existing tech companies that want to expand into new business activities. Both of these approaches would streamline the administrative responsibilities associated with basic setup or business pivots.

Continue developing a regulatory structure that's conducive to tech entrepreneurship and operations

Ensure the new entrepreneurship visas are aligned to the unique needs of young companies and global talent

Currently, visas for foreign nationals (from outside the GCC) are required to be attached to either a local sponsor or a full-time employer. This requirement presents challenges to entrepreneurs who want to come to the UAE because they see potential in the region and want to experiment to find a viable business model, or those that wish to leave full-time employment to explore entrepreneurship.

Recent developments have addressed this issue by targeting entrepreneurs that want to relocate to the country before they have finalized their idea. The ADGM, twofour54 and other free zones are considering entrepreneurship visas to help attract entrepreneurs for the setup phase of their development. These initiatives are very well received by the tech startup ecosystem, and believed to be instrumental in the ongoing development of tech startups.

Maintaining focus on the needs of foreign talent and early-stage entrepreneurs will be critical to ensuring their success. Unnecessary restrictions or high office rental requirements could deter otherwise willing immigrants to the region with good ideas. Given the UAE's history of successfully attracting highly talented professionals, however, removing restrictions will be key to maximizing the number and quality of skilled migrants.

Another critical element is to clearly spell out any restrictions in terms of business activities related to these special visas, so that new entrepreneurs do not go against local regulations unnecessarily. Caps on revenue, hiring, or restrictions from certain activities or within regulated industries should be clearly communicated.

Create a Ministry of Innovation that unifies innovation and tech entrepreneurship efforts across ministries and emirates

The UAE, and Dubai in particular, has recently introduced a number of new Ministers and Ministries in line with its strategic goals as a country. Joining existing ministries key to running the country such as finance, newer UAE Cabinet additions have included Ministers of Youth Affairs, Happiness and Wellbeing, Tolerance, Food Security, and Artificial Intelligence. These ministers elevate the focus of the topic within the Cabinet's agenda, and signal to the market the importance of the topic to the national strategy. In other countries such as Malaysia, innovation ministries exist to increase the country's competitiveness in science and technology, and to oversee the county's achievement of national plans in this area.

Creating a Ministry of Innovation could serve a similar purpose, demonstrating the country, or an emirate's, strong commitment to develop R&D, innovation, and tech entrepreneurship. This position could also serve as a watchdog or coordinating body ensuring that the sum total of activity lines up with the government's aims. This function could also be responsible for interactions between local and expat programs, to facilitate both knowledge sharing and job creation.

Maintain focus on and publicize transparency in court cases in new jurisdictions to attract foreign investors and reassure local ones of the strength of the regulatory framework

The UAE has begun developing world-class regulatory frameworks governing business and tech startups, via strong commitment and investment in carefully-crafted jurisdictions and updates to existing laws. Dubai's DIFC is an early example of how the government can create a strong, trustworthy, independent jurisdiction, complete with its own laws, court system, and dispute resolution process. ADGM in Abu Dhabi is likely to also be highly competitive, providing the assurance of English common law for young entities that want to set up in a best-in-class regulatory jurisdiction.

Both initiatives, and others, benefit from well-drafted regulations. However, the nature of regulatory frameworks means that many benefits are only realized over time, as the private sector and related legal community understands the basis for decision-making. Capitalizing on the strong decision-making by focusing on both establishing precedent and communicating decisions can speed up a common understanding of the benefits of the jurisdictions. This would probably mean making thorough judicial opinions public and easily accessible, so that the legal community can understand how decisions are made. As the international community gains knowledge of the transparency and fairness rulings of these jurisdictions, foreign and local investors are likely to view tech companies registered in these jurisdictions as safe havens for investment. In turn, this will encourage new registrations within the UAE, reducing the common practice of registering companies in foreign offshore jurisdictions such as the British Virgin Islands or Cayman Islands.

Lead the creation of an entrepreneurship association that liaises between young tech companies and the government

To help ensure that regulation and policy is targeting the needs of young companies at the right stages of their growth, a government-led association made up of both entrepreneurs and public servants could help to provide input into and influence government policy for innovation entrepreneurship. This group could provide both the data and testing ground for early changes and innovations, shaping both the language of new policies as well as enforcement and implementation guidelines.

Other jurisdictions such as the UK actively solicit research and opinion papers from industry in advance of a major policy change. Similarly, the UAE is known for involving key stakeholders in decision-making that affects business and other policies. This provides a good foundation for a formal body that both serves the government and communicates decisions to the wider tech entrepreneurship ecosystem.

Develop a program that encourages growth-stage tech enterprises in the region and beyond to relocate to the UAE

Given the size and vibrancy of the UAE's private sector and its regional leadership in certain areas such as media, finance, and tourism, the country is particularly attractive to scale-ups looking to accelerate their growth in the region. Many young tech companies around the region start small in their local markets, then relocate to the UAE, once the business model is proven and they want to target multinationals or large players as customers, partners, platforms, or investors.

Accelerating this process by deliberately targeting young and growing tech companies in the MENA region that demonstrate promise and represent significant job creation potential could yield results in the form of faster exits of greater size.

Support services that could be provided include subsidized visas, streamlined setup requirements, and office space subsidies. This model is similar to how existing anchor clients initially came to the UAE to set up, and even how anchor tenants in the malls are initially attracted. Over time, these companies not only pay full price for their services, but they contribute substantially to the economy by consuming large amounts of office space and becoming significant job creators. In some cases they become investors in local startups. When television broadcaster MBC relocated from London to Dubai, it became one of the largest tenants in Dubai's Media City and one of the largest employers in the free zone with a total staff size of 1,800 (worldwide).

Similar success stories could be achieved by targeting young tech companies.

Play a role in easing market access for tech entrepreneurs

Ease cross-border regulatory differences between the UAE and KSA

The Gulf Cooperation Council is a Customs Union; however, differences in how laws are interpreted and carried out have been impacting young tech companies operating across borders. Taking a leading role in easing regulatory differences, by setting up advisory and facilitation offices that target easing regulatory compliance and facilitating cross-border trade can help enable market expansion opportunities for young startups.

The UAE government could also actively solicit Saudi entities that are available to act as local partners, distributors, and other facilitators to cross-border trade, given the high number of UAE companies that require this service. A registry and facilitation office could speed up this process and help connect UAE entrepreneurs with appropriate counterparts in Saudi Arabia.

Form partnerships with Chambers of Commerce in target markets to create cross-border linkages

In the UAE, partnerships between local Chambers of Commerce and those representing other countries is common. Dubai Chamber's partnership with ASAE Foundation is one example, connecting the Dubai Association with a nonprofit organization representing American executives.

Expanding these relationships to create cross-border partnerships with Chambers of Commerce around the world could help ease market expansion challenges for UAE startups. These partnerships would focus on bilateral export-regulations advisory services, and cross-border partnerships. In Dubai, Expo 2020 could serve as an important jumping-off point for forming these initial partnerships, as the fair's focus will be on international linkages and showcasing the abilities of Dubai companies.

Open market development offices in key cities including Cairo, Riyadh, and Amman

Young startups in the UAE often look to other regional cities in Saudi Arabia, Egypt, and Jordan to source both talent and customers, leveraging the UAE's unique position to center their operations and to scale up and grow. In cities such as Cairo and Amman, there are large numbers of developers that serve the back office and web development needs of tech companies. Given requirements for visas and a cost of living in line with global metropolises, many companies grow their UAE teams and relocate web development teams only when cost and development goals allow it. Taking a leadership role in this activity, the UAE could establish partnerships and programs with institutions or web development centers in Amman, Cairo, and even cities in Europe such as Ukraine to facilitate early-stage remote web development services. Over time, developers who work on UAE projects can be selected for special immigration programs into the UAE to continue growing UAE companies, perhaps under special low-cost visa programs. This would grow the developer talent in the UAE.

In other strategic cities such as Riyadh, Cairo, Istanbul, London or New York, export development offices could target the expansion ambitions of startups into those countries. Similar initiatives around the world have seen governments create 'launch-pad' offices and programs that facilitate export services into foreign countries. These programs have dedicated resources to help facilitate deals, make local introductions, serve as an authority for critical locally relevant information such as regulation, and offer training in local business practices.

Conclusion

With a tech ecosystem that many participants feel started only in 2010, the UAE has done well to build up the infrastructure and attract startups within an innovation ecosystem. Early business models were copies of those found elsewhere, as investors unused to the requirements of technology companies sought familiar recipes for growth and scale. But now, locally-grown models and innovative ideas are beginning to emerge and gain traction, proving that the country – and region – can be a hub for leading ideas.

The UAE is in the enviable position of being highly capitalized, yet the tech ecosystem is still evolving to be able to estimate how much capital is needed and how it should be allocated. The government has been hard at work to address these issues, targeting incubators and youth entrepreneurship as key mechanisms both to attract global startups and train local ones. The impressive spending and focus on developing the tech entrepreneurship ecosystem is well in line with the government agenda to both create high-quality jobs in the knowledge economy and attract local citizens to work in them.

These efforts, which have been embraced by ecosystem participants and are expected to be highly successful, are likely to only bear fruit in the long term. Continuing to take a centralized yet loose view of the ecosystem, providing opportunities for both local and expat entrepreneurs, and building the institutional foundations of innovations will ensure that the results of previous efforts are maximized.

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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.

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.

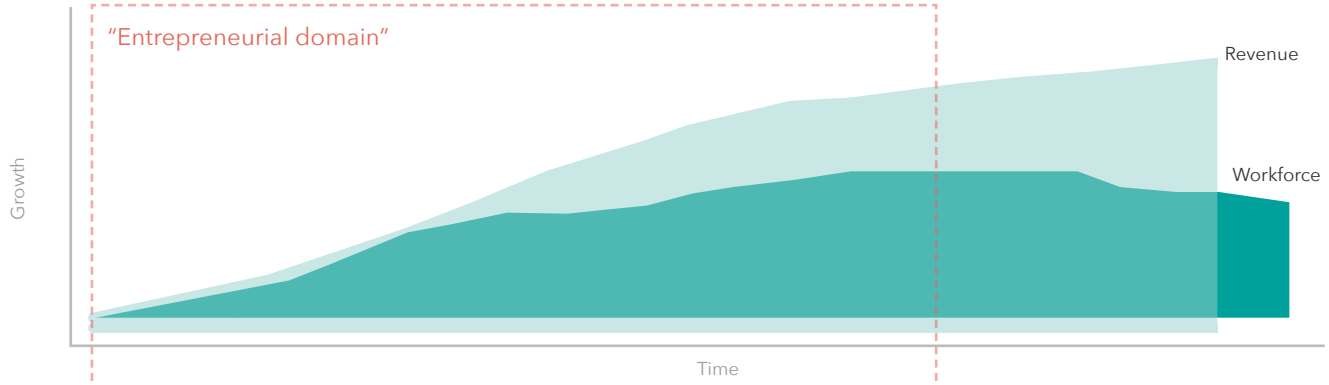
Agents of change who create new value propositions by means of new products, services, innovative processes, and organizational innovations that lead to evolution or obsolescence of current way of things

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

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% CAGR1 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

Source: Global Entrepreneurship Monitor (GEM) Global Report 2016/17, Global Entrepreneurship Research Association 2017

1. High-growth Enterprises and Gazelles – Sensitivity Analysis, Ditte Rude Petersen and Nadim Ahmad, OECD 2007

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, hardware

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 2016-2012 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

Disclaimer

This report was prepared independently by OC&C Strategy Consultants in collaboration with Wamda who have both been commissioned by Google to research the tech entrepreneurship ecosystem in UAE (in addition to other developing countries in the GCC, East Europe and 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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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 (64-18) 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

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