Coller Venture Review

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TEL AVIV UNIVERSITY

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CITY VENTURE
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THE SELF-SUSTAINING CITY-STATE

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EMPLOYMENT BLACK HOLES

THE KEY TO THE WEALTH OF CITIES

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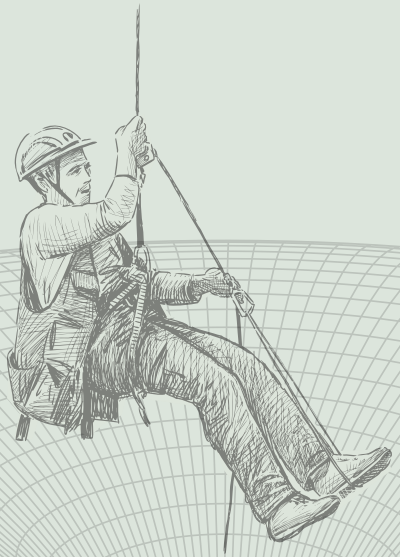
Yesha Sivan
Professor and Executive Director, Coller Institute of Venture at Tel Aviv University

Nathan Zeldes
Director of Research, Coller Institute of Venture at Tel Aviv University



Introduction: Warping a Flat World with Black Holes

In this article, we present a model that can guide city leaders in their quest to create and sustain jobs. We call this model "black holes for employment."

Historically, we always had cities that were centers of economic action and thus jobs. In the old days, we had Babylon, Rome, Istanbul, Venice, and later Paris, London, Shanghai, and New York. These cities survived, at times for centuries, before yielding to other more appealing centers; they were doing the right things, and these things endured.

JOBS ARE BEING SUCKED AWAY TO OTHER CHEAPER OR SMARTER OR UNIQUE CITIES

What has changed in the 21st century, and will continue to change, is the fact that the world has become flat and smooth – "flat" in the sense of allowing mobility of people, ideas, and enterprises; "smooth" in the sense that it is becoming easier to move. The twin forces of globalization and digitization are making the world of jobs a flat world where the quality jobs can disappear from one city and reappear in a more attractive one with great rapidity. In these attractive cities, old barriers such as language, immigration, culture, and funding are disappearing.

The new flat and smooth world communicates in English; supports job-related immigration; uses culturally similar social networks (whether WeChat, Facebook, Weibo, or Twitter); and serves Coke or Pepsi. In this world, we all use an iPhone or some flavor of Android, and most software coders (including in China) – a critical component of many new jobs – are using Google or Stack Overflow to search for code snippets. City managers find themselves competing in a global world where ideas, people, and capital are pulled to the best cities across the globe.

Cities and countries that fall behind in this game are destined to stagnate, as happened to Detroit, Pittsburgh, Venezuela, and even Lithuania. Jobs are being sucked away to other cheaper or smarter or unique cities, exacerbated by automation and its sexier sister artificial intelligence (AI) which allow a few jobs to serve millions of customers remotely. Evermore, jobs are disappearing because the smart, innovative leaders who create jobs are attracted to better hubs of employment.

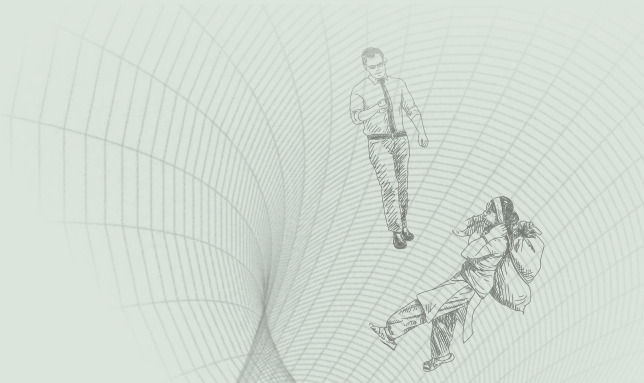
Enter the black holes model that both depicts the problem and offers the solution.

Black holes are celestial objects that wield powerful gravitational forces – forces so strong they pull in matter (i.e., jobs) at the expense of other stars, and even pull in light (i.e., the venture leaders who create jobs).

With this analogy, we introduce the concept of "employment black holes" – geographical areas so compelling that they pull in talent, funding, and innovation, and thus constantly create and sustain jobs at the expense of the less fortunate cities.

The paragon of black holes is Silicon Valley, that Mecca of innovation which is pulling the best and the brightest even from other black holes such as Boston's Route 128 (Mark Zuckerberg left Harvard for Silicon Valley). Beyond Silicon Valley, the Boston Route 128 area is a black hole of biotech ventures, Israel is one for IT/Cyber ventures, and Shenzhen is the black hole for hardware ventures. Smaller black holes may include New York for ad-tech, and Seattle for anything that is Microsoft/Amazon-related (yes, being near giants can be the core of a black hole).

The black holes model depicts the key problem facing cities. At the same time, the model also hints at the solution for aspiring cities. In the following, we will expand upon our definitions of cities, jobs and domains; the problem of sucked-away jobs; and the solution of choosing a domain. In the conclusions section, we list the four steps a city leader must take to create enduring jobs.



In this article we use the following related definitions:

Enduring city-states or just "cities" – geographic areas large enough to maintain the critical mass of resources (people, land, money, and decision making) required to enable a viable venture ecosystem. Note that this definition transcends the usual definition of a city. Our definition includes large cities such as New York, London, and Paris; "city-states" such as Hong Kong and Singapore; small countries such as Israel, Hungary, and Switzerland; and large metropolitan areas such as Shenzhen and Shanghai. This definition corresponds to a population size of 5 million or more people. Note that with this definition we lump all the cities of Israel into one "city," and we position all the cities (as defined here) in competition with each other.

Enduring jobs or just "jobs" – jobs that employ people within the city and that are inherently difficult to move elsewhere; these jobs have a unique reason to stay in the locale for the long run. Such jobs are far more valuable to the city than jobs that can be sucked away in today's globalized reality. The immovable jobs that are of particular interest to us are those that also reach beyond the borders of the city, and generate value for other parts of the world.

Enduring domains or just "domains" – this is the concept at the core of our message. A strong focus on a particular domain is the only method that will allow cities to keep enduring jobs. A domain is what defines the employment black hole. Note that such a domain must not be too big or too small; for example, domains that are too big are Internet of Things (IoT), IT, generic medicine and, conversely, domains that are too small are those such as light switches, software for labs, dealing with ALS. A good measure for a domain: it has an addressable global market of above US$10 billion annually.

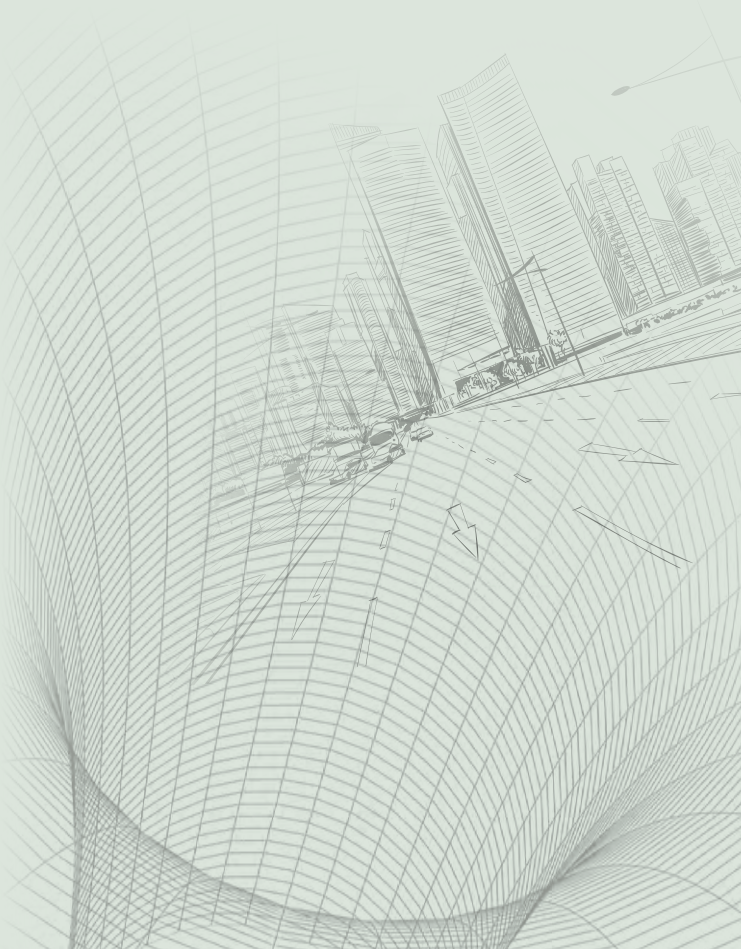
Using these three terms – enduring cities, enduring jobs, and enduring domains – we can frame the problem facing city-state leaders and the answer we propose using the **Employment Black Holes** model.

SOME KEY FACTORS

Two factors that must be kept in mind when pursuing this model are described in two boxes following this article:

1. The city's internal treasure of data – generated by a myriad of sensors, Internet of Things (IoT) data streams, and databases. These can be put to good use in empowering new ventures, as described by Ken Herron.
2. The city's citizenry, acting in "Bottom Up" fashion to affect, support, inform and engage the ventures in the city and the city government that in turn affects the same ventures. This factor is presented by Eyal Feder-Levy.

Other factors affecting the City/Venture connection are described by Robert Huggins in his article "Key factors of city success ."



1. The Universal Problem: They All Can Leave – and They Will

City leaders are facing (or will soon face) the same question: how to create and maintain enduring jobs. The question is not "how to create and sustain jobs"; it is "how to create and sustain enduring jobs that will not be sucked away."

Once the base conditions of the city are met (basic quality of life, reasonable tax regime, education, transportation, etc.), all cities start to look and feel the same from the point of view of jobs. An incremental addition or modification to the venture ecosystem, such as a local university, research center, industrial park, start-up workspace, incubator, accelerator, an event or a competition, makes very little difference. Such generic measures will not retain the innovators who are being lured away by the funding, ambiance, and sheer energy of black holes. In fact, such indirect actions are merely creating jobs for other cities.

In a global, fluid, flat, and smooth world, **they all leave – talent, results, successful firms, and, ultimately, the jobs.** For example, innovative entrepreneurs create a start-up, gamble on an idea, get their family to invest, create value – and then either relocate to greener pastures with their creation or sell it to a company in Silicon Valley. Even established local firms, in their justified race to innovate, often choose to establish their future R&D center elsewhere (Israel, for example, hosts more than 100 multinational companies due to its robust venture ecosystem – the key to Israel's employment black hole). Individual and firm-level brain drain exacerbate the situation as the city is left with second-tier players, which leads to false venture starts, inefficient capital allocation, and spiraling decline. A case in point is Lithuania, where the emigration of young people to Britain and other advanced E.U. countries reduced the population by 27 percent between 1991 and 2015, leaving the country with a major demographic problem of an aging population and a declining birth rate – and lack of venture leadership.

Another telling example: DJI, the global drone leader, rumored to be worth US$10 billion (in 2016), was founded by Hong Kong University of Science and Technology graduate Frank Wang in 2006, and moved to Shenzhen soon after. DJI has 3,000 employees – many of whom could have been based in Hong Kong. In the DJI case, we see both the potential (of innovation created in Hong Kong), and the missed potential (of innovation departing Hong Kong for a "better" black hole).

SILICON VALLEY WILL CONTINUE TO BE THE MEGA BLACK HOLE

To enjoy the long-term impact of innovation, and to justify public investment in innovation (in universities, industrial parks, and other policies), Hong Kong's government must design its innovation support for one purpose: enduring jobs that stay in Hong Kong for the long term.

Even worse, the façade of sporadic start-ups that are developing apps, or a 3D maker community, or yet another social network, is not going to create enduring jobs. Such easy commodity innovation – if successful at all – is the first to be sucked into the more relevant black hole. If you are doing digital ads, you will be lured to New York City; if you are doing cyber, you will be drawn to Israel, Seattle, or Minneapolis; if you are doing hardware, you will end up in Shenzhen. In the age of a frictionless world with powerful pre-existing black holes, building the conditions for an enduring venture ecosystem is becoming increasingly difficult.

If you are blessed to be leading a city with an established employment black hole, you really only have to perpetuate the good things that are happening in your city. Silicon Valley will continue to be the mega black hole. Israel will continue to leverage its unique combination of defense investment, more than 100 multinational firms with a local R&D base, skilled employees, and lots of global and local capital, all mixed in with the aura of the Israeli chutzpah. Shenzhen will continue to maintain itself as a giant in hardware and software; New York will remain the nexus of the advertising world. And so on.

2. The Only Solution: Create an Employment Black Hole

If you are leading a city without a distinctive employment black hole, you have one choice and one choice only: build a unique employment black hole of your own. Following are a few insights as to how to create and manage such an employment magnet.

First and foremost, you have to identify or create an "unfair advantage" that skews the playing field your way. Assuming you have the base prerequisites of a venture ecosystem, you must identify a specific location-dependent advantage that will enable ventures in a specific domain to thrive in your city. We share some examples in Table 1.

Note the key phrase "location-dependent": you must ensure that the start-ups and innovation, the jobs and the expertise will not migrate out simply because your city has the best conditions in the world for the chosen domain.

In some cities, there is no inherent prior advantage such as the presence of a geographic edge, natural resource, or a key cluster that can attract and retain venture. Such cities need to create a "virtual unfair advantage" from scratch. For example, invest in a major, focused R&D institution with

Table 1: Examples of Unfair Advantages that Create Employment Black Holes

Source: Author analysis

CITY	SIZE*	UNFAIR ADVANTAGE	DETAILS
Shenzhen, China	Large	Chinese government's decision to promote innovation in Shenzhen	Leveraged the Chinese government's powerful decision to create a huge, vibrant innovation hub, employing talent from all over China
London	Large	Financial center	Leverages the City of London's financial position to enable a thriving Fintech scene
Israel	Large	Quality human capital trained in technology during military service	Leveraged the defense spinoff in tech unit graduates and the demand for defense tech to seed a vibrant start-up scene
Boston (Route 128)	Medium	Proximity to MIT and Harvard, critical hi-tech venture mass achieved before globalization	Second only to Silicon Valley, with the same causes
Silicon Valley	Medium	Proximity to Stanford, critical hi-tech venture mass achieved before globalization	The indisputable leading tech ecosystem
Berlin	Medium	Low cost of living coupled with high quality of life	In the process of defining its direction, Berlin currently positions itself as the best place in Europe for start-ups to commence
Houston	Medium	Proximity to oil fields and a major port	Houston became a major energy hub, and a leading center for building oilfield equipment
Newark, NJ	Small	Critical mass of research hospitals and other health and pharma players	Created a vibrant Health IT cluster in the region
Reno, Nevada	Small	Unlimited cheap real estate, in proximity to Silicon Valley	Specializes in land-hungry businesses such as fulfilment centers, data farms and warehouses that Silicon Valley needs, culminating in Tesla's battery Gigafactory – the largest factory in the world

* Size: Small = < 1M inhabitants; Medium = 1M - 5M inhabitants; Large = > 5M inhabitants

industrial partners which will make your city the leader in that domain (see "Hyper-Local Venture Development" in this issue to learn how Newark went about creating a leading Health IT cluster).

Another measure to create a virtual unfair advantage is to attract an anchor player. For example, Israel leveraged a five-employee Intel design center in the 1970s to attract – through well-placed financial incentives – a major and growing manufacturing and design presence of that company. A total investment by the government of US$1.5 billion over four decades led ultimately to an investment by Intel of US$17 billion, the creation of 10,000 jobs as of 2016, and some 30,000 indirect jobs. Another benefit was that the thousands of people who left Intel over those decades seeded numerous hi-tech activities in the country, started over 200 companies (among them EasyChip and Mellanox), and played a key role in making the country attractive to other hi-tech corporations.

Some useful tips based on our observations:

- **Capital is not a problem**. Ample capital was available in 2016, and will be in the foreseeable future, for good firms with good ideas. Capital is the most global of the forces in the venture ecosystem. Once the base conditions are established (namely reasonable taxation and control of assets), capital is the easiest factor to enlist. In fact, venture capitalists (and their older brothers in Private Equity) are looking exactly for the unfair advantage that your black hole will offer.
- **Pick and gamble on the right size of domain**. For example, the Hong Kong Polytechnic University which, together with Boeing Corporation, has established an Aviation Services Research Centre (ASRC) in the city, can then become a supporting part of a black hole in the domain of airplane maintenance and related fields.
- **Forget generic digital innovation**. Anything that is digital can be snapped up by the mega players from other locations – the likes of Microsoft, Google, and Facebook, or their Chinese counterparts, Baidu, Tencent, or Alibaba. Always bet on innovations that cannot be transplanted easily.
- **Partner with the private market.** Once you choose your domain, strive to lead it with others. For example, there is no need for direct investment – you can use PPP (Private Public Partnership).
- **Engage in successful branding**. "We are the Nano city," "We are the Brain capital," "We are the Shipbuilding place"... You need to have your domain and your city firmly linked in the minds of venture stakeholders worldwide.
- **Don't waste your energy on generic endeavors** such as a generic university, industrial park, or innovation program. Direct your support effort and resources to your chosen domain.
- **Enlist needed support from higher levels**. You have to control what you can at your level (city), and then enlist the needed support of the levels above you (be they the encompassing region, state, or economic zone).
- **Think ahead to your next domains**. An enduring domain is great, but it may not last forever (think petroleum in Arabia, gold digging in the U.S.A., tulips in The Netherlands). Having everything tied to a single domain can lead to a painful collapse at a future time. Explore the possibilities of future "unfair advantage" areas to develop.

A PEEK AT WHAT YOU WILL FIND IN THIS ISSUE

While this article looks at employment black holes in theory, the rest of this issue brings a wealth of practical examples of these principles in action. There are six articles that explore in detail the stories of seven cities, and one that examines the theme of venture city success in general.

Thillai Rajan A. and Vikram Kapur, in **"The Role of Ventures in Strengthening the Fabric of the City,"** argue – using the city of Chennai as a case study – that a symbiotic equilibrium between the city and the ventures within it can lead to a virtuous effect that greatly benefits the host city.

Michael Ehrlich, in **"Hyper-Local Venture Development,"** describes the successful implementation of a Health IT Cluster in Newark, NJ. He uses this case to illustrate a general framework for hyper-local cluster development, which focuses on fostering successful hi-tech start-ups through the scale-up phase.

Horace Yeung and Flora Huang make a fascinating comparison of two neighboring yet very different cities in **"The 'Tech' of Two Cities."** The fact that Hong Kong, with its once admired British systems and traditions, is falling behind Shenzhen derives from cultural and institutional factors outlined by the authors. Meanwhile the Qianhai Shenzhen-Hong Kong Cooperation Zone, a national-level initiative to combine the core strengths of the two cities, is an intriguing attempt to integrate the two systems for mutual benefit.

Hanan Brand, Helen Wexler, and Wendy Singer analyze the rapidly growing venture ecosystem of Jerusalem in **"The Business Kibbutz."** They focus on the contributing factors and demonstrate that the success of the budding Jerusalem tech ecosystem has been due to a unique collaborative model, in which the relevant layers of the ecosystem combined forces to create a highly connected and supportive venture scene, leading to a sense of local pride and a strong, integrated community.

Jack Wroldsen's **"Reno's Venture Gamble"** tells the story of a city that bootstrapped itself from failure to success by identifying its strengths and leveraging them to create an effective "black hole," culminating in bringing Tesla's Gigafactory into its business park.

Eze Vidra, in **"Dealing With Political Change,"** assesses the impact of Brexit on London's future competitiveness. He examines the durability of key components of London's venture fabric: availability of talent, access to capital, and the density of network required to make start-ups scale. The article is based upon primary data collected through a survey of London-based entrepreneurs, and triangulated by interviewing leading members of the London venture ecosystem. The article generates new and actionable understanding of the London venture community's ability to survive, or even thrive, in a post-Brexit context.

Robert Huggins, in **"Key Factors of City Success,"** examines which are the factors that determine which cities will succeed and which will fail in developing a venture-based prosperity. His analysis shows how capital, institutions, and psycho-cultural behavior promote economic growth in venture cities, and presents practical recommendations for city leaders wishing to evolve these critical factors.

In addition to these articles, there are 11 CIV City Cases, each devoted to a single city, and describing its experience in venture in a standard format. These boxes pay special attention to the strengths and weaknesses, factors, and institutions that affect each city's success, and conclude with lessons that can inform other cities. You will learn here the insights generated by cities from Berlin to Shenzhen and from Chennai to Tel Aviv.

Conclusion: The Four Steps an Enduring City-State Leader Must Take

Based on the observations we shared earlier, here is our advice to city leaders wishing to enable their cities to succeed – and continue to do so – in the coming decades:

1. **Establish a minimum base**. If you don't have the basics in place (education, immigration policies, ubiquitous Internet, venture-friendly tax code, etc.), strive to get them. You will not be able to compete – and build a black hole – if you don't have these basic prerequisites covered. Note the term "basic": lack of these enablers will certainly prevent a city's success. Once you have achieved the base conditions, move on: investing in a strong unfair advantage is far better than working on a marginal improvement in the basics.

FOCUS ON AREAS THAT ARE NOT ON ANYONE ELSE'S TURF

2. **Select your domain based on your "unfair advantage."** If you have a physical one (oil deposits, tourism, a large local firm, some natural resource), make it the basis for your local black hole; if you don't, then invent one. Make sure the domain you choose for your black hole is NOT in the gravitational well of other black holes. For example, stay away from pure digital firms that will be snapped up by the giants of the industry. Focus on areas that are not on anyone else's turf. (Check out CVR #3, our "Deep Innovation" issue, for some ideas of potential fields you might decide to make your own.)
3. **Support the domain with the visible hand of the public sector to lead the invisible hand of the private sector.** You should not do it alone. Beyond the selection of the domain as a leadership act, you should allow and invite private players to take the lead. You can and should support the domain with friendly regulations, becoming a key customer, sharing data that may supply an unfair advantage, and suchlike. But don't invest or aspire to manage the companies, the investors, or the technologies – leave the management to the entrepreneurs or intrapreneurs, the venture people or the angels, the inventors and the scientists.
4. **Choose the next domains.** To prevent reliance on a single advantage, after the initial set up of the first black hole, continue to support its local leadership, and move on to establish the next black hole!

In conclusion, our message to city leaders: to sustain jobs you must have an employment black hole – you have no other choice. If you have a unique unfair advantage, use it, and if you don't, you need to create such an unfair advantage by sheer leadership. In both cases, aim to boldly construct and then maintain your chosen domain. Lead with courage and force because you are competing with other city leaders who want to do the same thing. Your role as a leader is to work with the other venture ecosystem players toward a focused, self-sustaining domain that will keep quality jobs in your venture city for the long term.

A FACTOR TO KEEP IN MIND: URBAN IOT UNLEASHES VENTURE CITY INNOVATION

Ken Herron
Chief Marketing Officer, Unified Inbox Pte. Ltd.

Municipal authorities worldwide are substantially expanding their Internet of Things (IoT) networks in order to maximize their efficiency, responsiveness, and resources. With access to trillions of dollars of assets under their control, the overwhelming majority of each city and country's functions will be tightly regulated, monitored, and controlled.

These networks – and their resulting zettabytes of data – will serve a core purpose for each authority. They can also provide previously unavailable platforms for venture innovation across otherwise unreplicable networks and assets. New and different uses for these networks will yield completely new business models, products, services, and even industries well outside the purview of authorities.

Unleashing these networks and their data, and making them accessible for new ventures to explore and monetize, provides a once-in-a-generation opportunity. It all starts with access. Only the municipal authority has legal access to assets and infrastructure, including: street fixtures, roads, bridges, railroad tracks, garbage trucks, sensors, sports and recreation areas, among others. New ventures, if given access, can find ways to use and leverage this information in transformational new ways.

For example, many authorities have pedestrian sensors which gauge the volume of foot traffic in different areas of their cities. Imagine the value these data could provide to transportation, retail, and advertising companies in order to improve their efficiencies, reduce their costs, and increase their taxable revenues. While these services will never be in a city's crosshairs, each could be made into a valuable service, all from leveraging the untapped value within existing networks.

Another example is airport taxi queues. Airports – and their waiting passenger data – are controlled by local authorities, while transportation companies are privately owned. Unleashing passenger data would trigger a cycle of new services, efficiencies, and revenues.

The opportunities are limited only by ventures' imaginations. Innovative segments in each city are just waiting for an invitation to create. For some, the municipal authority itself may be the initial or primary client by increasing efficiencies and reducing costs in the provision of public services. Sadly, municipal authorities often lack the means and skills to internally explore these innovations. Opening their networks not only brings in fresh new thinking, but also supports rapid new venture development and commercialization.

The IoT networks for municipal authorities are constantly being expanded, and their rate of expansion will only increase. Through technology convergence, big data, and the growth of artificial intelligence (AI), the opportunities for innovation are constantly breaking new ground. Providing entrepreneurs in each area with new means to explore the potential eliminates their need to make costly, risky, and often prohibitive investments in creating their own networks.

However, open, free access for all may not be the best option. A platform and application process would be needed to manage access and delivery of the specific, real-time information streams to relevant parties. This would be an investment on the part of each authority, but in terms of creating innovation for themselves and encouraging new ventures within their cities it will prove to be a worthwhile effort.

A FACTOR TO KEEP IN MIND: THE ROLE OF "BOTTOM UP" IN THE VENTURE CITY

Eyal Feder-Levy
CEO, ZenCity and Coordinator, Tel Aviv University City Center

"Smart Cities" use digital technology, data collection, and analysis to manage the city and tackle challenges. In recent years, this has become a significant worldwide trend, but this trend faces strong criticism regarding its social implications and its ability to actually improve life in cities.

This critique has led to a new approach to Smart Cities – the bottom up approach, where value production is no longer exclusive to government, which shares resources to encourage other stakeholders to create solutions to urban challenges.

This approach provides a more sustainable version of the Smart City concept, one which does not rely solely on government resources. By doing that it spurs a new ecosystem, allowing for new, impactful ventures to grow while providing needed urban services, and even sparking solutions to as yet unknown challenges. It also deals with much of the social critique by creating an open environment that strengthens citizens' trust in government.

This creates a new challenge for cities – how to create this ecosystem of urban innovation?

While governments around the world are trying different approaches to this challenge, we recognize four key lessons for policy makers from successful examples:

1. **Leverage existing city strengths and resources** – local governments have unique resources that can be very valuable to entrepreneurs such as datasets and domain expertise, and sharing them can go a long way. A great example for this is San Francisco's "Startup in residence" program, where start-ups are selected to work closely with local government departments, receiving complete access to all relevant data and government personnel, while developing a needed solution. An important first step is creating an extensive open-data policy, making government data accessible and usable.
2. **Create a flexible procurement policy to allow experimentation** – experimentation and iteration are key to inspiring innovative solutions, but the strict procurement policy in government often limits the possibility to engage in it. In order to allow this experimentation, governments need to find creative and flexible ways to spend money. One example is creating innovation competitions such as New York City's "Big Apps," where entrepreneurs create urban technological solutions to compete for cash and collaboration prizes.
3. **Facilitate an open and inviting environment** – make start-ups and entrepreneurs feel welcome in the city and in government. Israel's Tel Aviv municipality has gone a long way to doing so. First, it gives start-ups a significant discount on municipal taxes. Second, it created a special process in government which allows entrepreneurs to request assistance from the municipality. Through this process, start-ups can apply to obtain data access, collaborations, advice, and other resources from the local government.
4. **Be open about the city's challenges and problems** – in order to inspire stakeholders to create solutions to real challenges, the city needs to be open about what problems it recognizes. In Paris's "Innovation Fellowship," the city described several key challenges it is facing such as disaster prediction and real-time transit information services, and invited young entrepreneurs from around the world to propose solutions, resulting in affordable, innovative solutions to actual city needs.

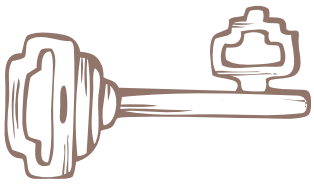
CIV HISTORY OF VENTURE DATABASE

Issue #2 of *Coller Venture Review* was devoted to the theme of the History of Venture, and focused on the explosive growth of innovation and the venture ecosystem in the past century.

In addition to a number of insightful articles, the issue showcases the Coller Institute HOV Database, which lists 160 entries.

These include inventions, discoveries, ventures, organizations, and other events that played a key role in venture from the start of WW1.

In this issue you will find cross-references to this database, which are marked with the key icon and database entry number.



FURTHER RESOURCES

KPMG (2014). Magnet cities: Decline | Fightback | Victory https://assets.kpmg.com/content/dam/kpmg/pdf/2015/03/magnet-cities.pdf

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Adam Smith (1776). An Inquiry into the Nature and Causes of the Wealth of Nations.

COLLER INSTITUTE OF VENTURE RESEARCH STRANDS

The Coller Institute of Venture (CIV) was founded in 2013 with the goal of advancing the global venture ecosystem. Our subject, "venture," is a critical aspect of the modern economy. The essence of venture is creating new companies that develop ideas, innovations, and models, and turn them into businesses. For more information, see:

http://www.collerinstituteofventure.org.

CIV's research is organized into strands, each addressing a particular aspect of the venture ecosystem. Current research strands are listed below.

Planned research strands include:

- Family Venture
- Corporate Venture
- Digital Venture

Coller Venture Review issues are each devoted to a single strand. This one focuses on City Venture, in which we examine the relationship between cities and venture; its articles and case studies offer insights and practical lessons for city managers wishing to take advantage of venture as a promoter of long-term city success.

Policy of Venture
civ.global/pol

University Venture
civ.global/univ

History of Venture
civ.global/hov

City Venture
civ.global/city

Deep Innovation
civ.global/deep

Financing Venture
(Coming Soon)

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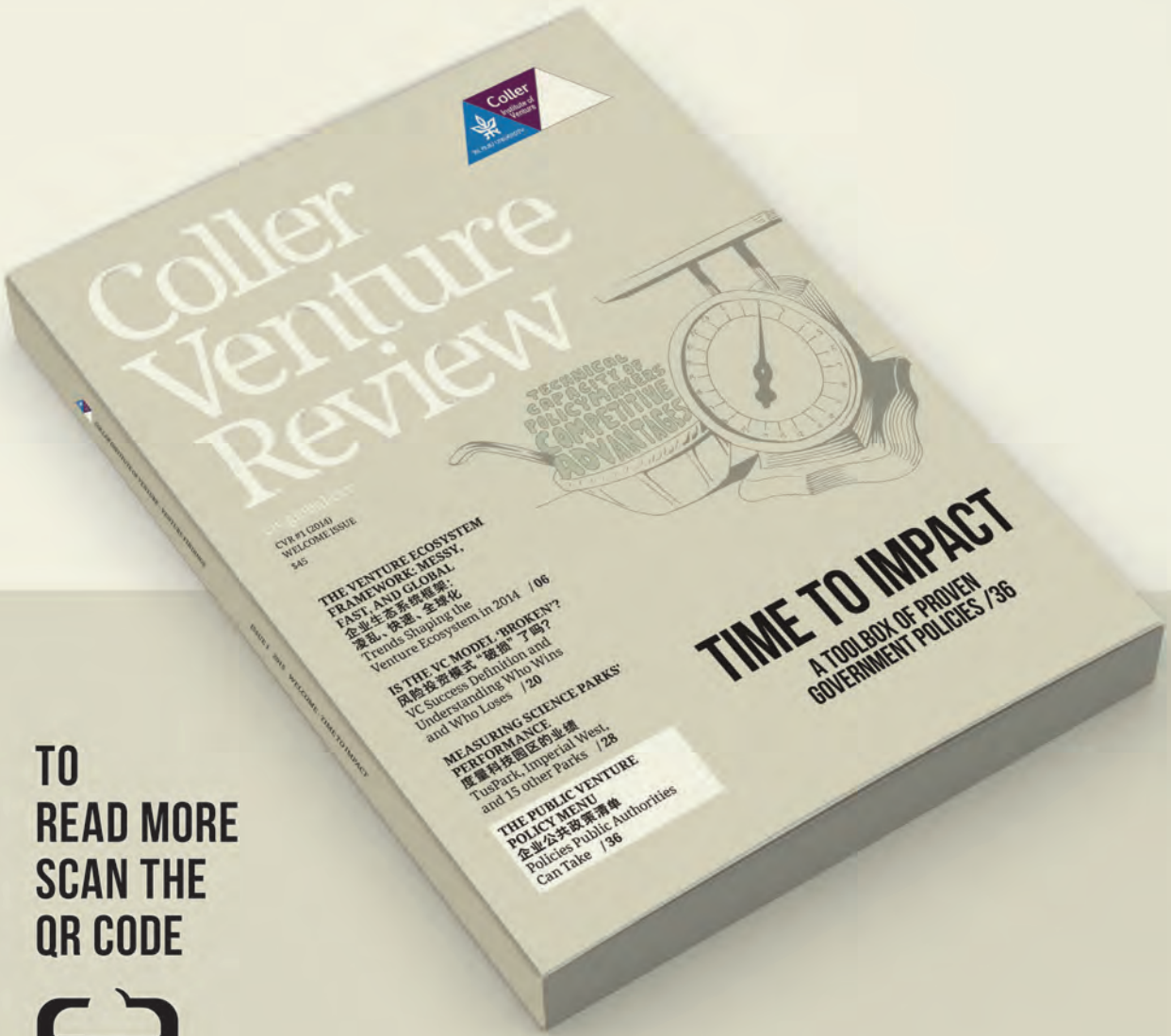
WELCOME/POLICY



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WHAT IS THE COLLER INSTITUTE OF VENTURE?

Jeremy Coller
Professor Eli Talmor

IS THE VC MODEL "BROKEN"?

Observations on VC Success: Who Wins and Who Loses within the Asset Class?

Allee Zhang

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Thillai Rajan A.
Professor, Indian Institute of Technology Madras and International Research Affiliate, Coller Institute of Venture

Vikram Kapur
Principal Secretary, Industries Department, Government of Tamil Nadu

THE ROLE OF VENTURES IN STRENGTHENING THE FABRIC OF THE CITY

THE CASE OF CHENNAI

Hindustan mein koi aisa zila na ho, aisa block na ho jahan koi startup na shuru ho. Startup India, Stand up India

Let there be no district or block in India where there is no start-up. Startup India, Stand up India

— Prime Minister of India, Shri. Narendra Modi, August 15, 2015

Introduction

In the last few years, India has become the leader among the emerging nations in venture investments and start-up activity. In terms of number of start-ups founded, India ranks among the top three countries globally after the U.S. and the U.K.

FOUNDING OF VENTURES IS INEXTRICABLY ASSOCIATED WITH THE SIX LARGE CITIES OF INDIA

A key feature of the Indian venture and start-up landscape is the dominance of the large cities. India has six large cities, Bengaluru, Chennai, Delhi, Hyderabad, Kolkata, and Mumbai, also called Tier 1 cities. LetsVenture, India's largest start-up funding platform, showed that about 75 percent of the start-ups registered in their platform were from the six Tier 1 cities.

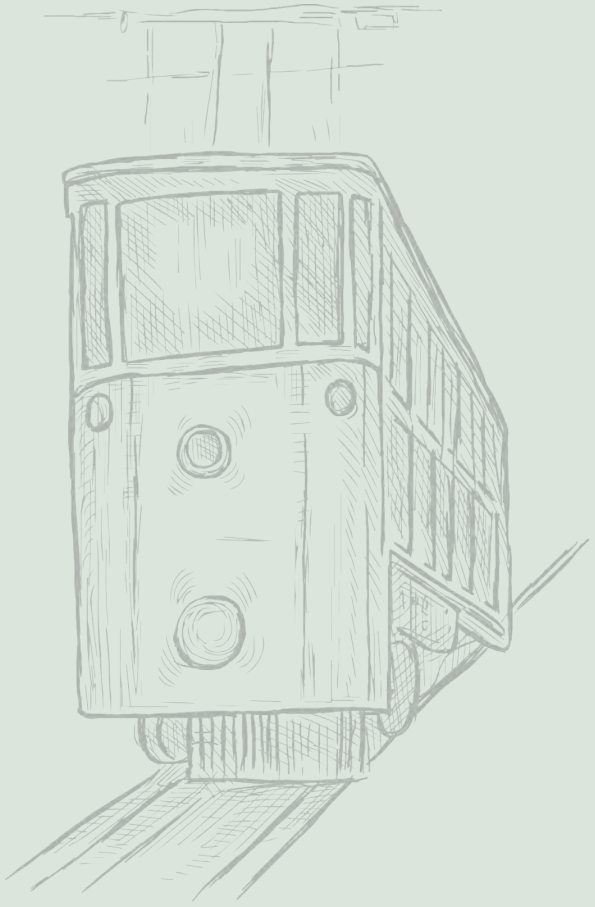
Of the total venture capital and private equity investment of $16 billion during 2000–2015, 67% were in ventures in the six Tier 1 cities, as were about 40% of the incubators among a total of 339. Based on a sample of 3,791 angel deals, Tier 1 cities accounted for more than 80% of the total angel investments and for about 88% of the angel investors.

Founding of ventures is thus inextricably associated with the six large cities of India, which have more conducive ecosystems for setting up of ventures.

Chennai, which is a major center for industry and business, is also known as the most conservative or traditional city of the six Tier 1 cities. This conservative nature can be seen and felt in various aspects of the lifestyle of the city's residents. In fact, the embrace of modernity in a conservative milieu makes Chennai a unique setting. For example, while Chennai has a thriving entrepreneurial culture, the nature of start-ups or ventures that emerge is qualitatively different because of the ecosystem.

While the city has the largest number of small and medium-sized enterprises (SME) in the traditional manufacturing sectors, the numbers of new age intellectual property and technology-driven start-ups and ventures is lower compared to those in Mumbai, Bengaluru, or Delhi.

In this article, we highlight the role of ventures in strengthening the economic and social fabric of a city, using Chennai as a case study. The discussion will be based on the following sectors that Chennai is known for: automobiles, healthcare, the movie and music industry, and software and information technology. Five boxes provide a background to these sectors. To highlight the social contribution of ventures, we also focus on the role of ventures in augmenting the services provided by various civic service agencies.



1. Ventures in Reinforcing the Economic Fabric

Pushing the industry's frontiers: Ventures bring in new business models, products, or service offerings to an industry, and over time they grow and become an integral part of the industry. Such ventures in the sectors that Chennai is known for have ensured that the city retains its leadership position in these sectors and contribute to the economy. For example, the information technology (IT) industry in India started with providing software services. Subsequently, the use of technology in business processes led to a generation of new industry called IT Enabled Services (ITES) or Business Process Outsourcing.

START-UPS CHALLENGE THE PREVAILING MINDSET AND BREAK NEW GROUND

The growth in ITES was primarily led by start-ups and ventures before large established software services companies started setting up their own ITES operations. Given the large English-speaking population of Chennai, cost competitiveness, and the traditional strengths in technology, many ITES start-ups originated in Chennai.

Since 2012, the trend has been to use the "cloud" to offer software products and services to the global market. The strengths in software development have enabled the founding of many "SaaS" start-ups in the city (see box: The emerging "SaaS" capital). By 2016, many of these start-ups had grown significantly (Zoho and Freshdesk employ about 4,500 and 800 people respectively) and can, in the course of time, become an integral part of the city's economic landscape, thus sustaining the status of the city as a leader in the software services industry.

Another example is the start-up Ather Energy (founded in 2013, and expected to have over 150 employees by the end of 2016) in the area of electric two-wheeler vehicles. This campus start-up from IIT Madras is engaged in the production of electric two wheelers. It was advantageous for this start-up to be founded in Chennai because of the strong presence of the automobile industry in the city (see Box: The "Detroit" of India).

Similarly, Chennai saw several entertainment and movie-based television channels being set up when the entertainment sector was liberalized for the private sector in the mid-nineties. That could happen only because Chennai had a strong movie industry, given the strong parallels between the movie and the cable TV industries. Today, many of these companies, which were once ventures such as Sun TV, Raj TV, and Vijay TV, are established industry leaders and further strengthen the reputation of Chennai as being a center of the movie industry.

New processes to promote efficiency: Start-ups help to usher in new practices in the industry, in turn making them more efficient and competitive. A good example is the venture Real Image, which was started by founders hailing from the movie industry in Chennai. Real Image introduced digital technology to the movie-making industry in Chennai. While the use of digital technology was producing great results in the West, it had still not been used by movie makers in India until the mid-nineties.

Real Image thus capitalized on the opportunity to introduce digital technology (in post-production such as editing, sound mixing, and even projection in cinema halls) to Indian cinema. It took the additional effort needed to import the equipment and technology and also train the technicians in the use of the new technology.

Given the promoters' knowledge of and network in the movie industry in Chennai, they were able to obtain access to an early market, which subsequently facilitated the adoption of the digital technology not just in Chennai but all across India. Digital technologies helped to reduce the costs and time taken for film production, which led to a dramatic increase in the number of budget movies produced, further reinforcing the status of Chennai as the leader in the movie-making industry (see box: The movie industry – "Kollywood").

Facilitating mindset change: Start-ups challenge the prevailing mindset and break new ground leading to strong positive externalities. The music industry

in Chennai, specifically classical music, is patronized by the Sabhas (arts societies) (see box: The music industry – "Margazhi Music Festival"), which are characterized by a conservative mindset. Forward-thinking members of the musical fraternity have used an entrepreneurial and venture approach to bring about mindset change in the industry.

One example is the start-up called Rhapsody, set up in the area of music education. Currently, music is given low importance in school education, where there can be just a single music teacher for the whole school. Rhapsody aimed to increase the importance given to music not as an end in itself, but as a means to augment skills in logic, math, and decision making.

By evangelizing the importance of music in early school education, Rhapsody has been able to provide relevant career opportunities to those who graduate from institutes of higher learning in music. Anil Srinivasan, the founder of Rhapsody, said that "the use of corporate or a venture set-up helps to focus on sustainability and growth. In the traditional sabha culture, people perceive music as a charitable activity largely for the social good."

Another example is the creation of Do Padu, a platform for independent musicians. Popular music in Chennai was largely film based with few avenues for independent music. To overcome the hurdles for independent music, Madan Karky, a popular lyricist, founded Do Padu to support independent music, which, in a short span of time, has become a very popular platform for independent musicians.

2. Ventures in Reinforcing the Social Fabric

Civic agencies in Chennai face severe supply side constraints. On the one hand, the boundary of the city has expanded (in 2011, the jurisdiction of the Chennai Corporation was expanded from 174 sq. km to 426 sq. km) and the population of the city is increasing. The residents are increasingly demanding better provisioning of various services. On the other hand, the resources available at the disposal of the agencies have not correspondingly increased.

VENTURES ARE STEPPING UP TO PLAY AN IMPORTANT ROLE IN ADDRESSING SOCIAL CHALLENGES

For example, while the capital spending of Chennai municipality is in excess of US$300 million, the primary source of revenue, property tax, is estimated at only US$100 million for 2016–2017 (other sources of capital spending include assigned revenues of the State Government, Finance Commission awards, Central and State grants, and loans from financial institutions). Because of such financial and other constraints, the municipality focuses mostly on providing basic and essential services. However, cities also have to undertake long-term projects to be better prepared for the future.

Increasingly, ventures are stepping up to play an important role in addressing social challenges and opportunities. Social ventures bring the discipline and rigor associated with the traditional for profit businesses to the social sector. Given the number of social ventures that have been set up in recent years, India has been described as the global epicenter of impact investing. Even in impact investing, large cities play an important role as about 85% of impact funding is in Tier 1 cities. In this section, we highlight the impact created by ventures to the cause of civic services in Chennai.

Achieving depth impact: Madhi Foundation, founded in 2015, is a non-profit organization set up in Chennai in the education sector. It works with the Chennai Municipal Corporation in bridging the skill deficit teachers have in teaching in English.

Over the years, the demand for learning in English has increased. However, it was found that the teachers in these classes did not possess adequate skills to teach and instruct in the English language. This led to a drop in enrolment rates. Madhi Foundation approached the Chennai Municipal Corporation offering to transform the classrooms, both in terms of input as well as output, with a focus on infrastructure, teaching methodology, and learning outcomes.

In order to train the teachers more effectively, the venture provided on ground physical support to the teachers, where the resource persons interact with the teachers once or twice a week in the classroom setting. In the span of one year, their coverage has increased to 16 schools run by Chennai municipality.

The Madhi experience shows that while large partner organizations are known for their scale of impact, such as the number of teachers trained or the number of children benefitted, and so on, smaller ventures are able to work closely with the individual teachers and achieve depth impact.

As stated by Merlia Shaukath, the founder and CEO of the organization, “Definitions of quality and excellence differ between large organizations and smaller start-ups. While large organizations focus on the scale of impact, say for example, the number of children who have developed numerical skills, a start-up or venture type of organization is able to focus on multiple higher order skills.”

Providing niche services: Rapid expansion of the city is placing tremendous pressure on the resources of the city administration. One such case is the management of solid waste. While collection, segregation, and management of solid waste is undertaken by the municipality or its appointed agencies in the central city, the vast sub-urban locations are often not well serviced.

Enterprising social entrepreneurs have set up ventures to fill the gap. For example, Earth Recycler Private Limited is a venture set up to innovatively administer the solid waste management in communities. Another example is the case of Kabadiwalla Connect, which helps residents to easily recycle newspapers and other forms of solid waste

with the help of a mobile app. By focusing on the informal or parallel ecosystem of waste management in the city, the venture has been able to contribute to the circular economy.

Similarly, another social venture, Chennai Volunteers, has created a technology platform that enlists volunteers and provides a matchmaking service between those who want to volunteer and the organizations that need such volunteers. The venture is able to connect volunteers with about 180 NGOs and institutions.

Evangelizing and implementation of technology solutions: Adoption of technology is generally poor in many of the local government agencies in Chennai. However, citizens are increasingly demanding better services such as payment of bills or logging of complaints through Internet or mobile channels, which necessitates development of technology solutions. In addition, technology solutions would help to exploit the rich data that many of these agencies have.

Since the civic agencies do not have the in-house capabilities to develop such technology solutions, they have to rely on external vendors. Ventures can play a very important role in developing cost-effective technology solutions. While large organizations do have the wherewithal to provide such solutions, it may not be seen as an attractive business proposition. Ventures, being smaller (cost competitive with lower overheads) and with the necessary technology capabilities, would be keen to engage in such opportunities to develop a proof of concept or to demonstrate their expertise.

Being smaller, ventures can also be able to react quickly to sudden opportunities. For example, during the Chennai floods in December 2015, employees of Mapbox were able to quickly develop an interactive Chennai Flood Map that showed the extent of severity of different areas affected by floods. The innovations of the map included (1) use of open source mapping technology; (2) enabling ordinary citizens to contribute their local knowledge to the application; and (3) enabling civic participation on a massive scale.

These examples illustrate how ventures provide innovative solutions using technology and differentiated business models that fulfill a felt civic need in the city. Ventures are able to target and address such niche needs that are normally beyond the radar of various civic agencies or large organizations as a serious business opportunity.

KEY DOMAIN: THE EMERGING "SAAS" CAPITAL

IT and IT Enabled Services (ITES) have traditionally played a significant part in Chennai's economic growth, with several large software services companies such as Tata Consultancy Services (TCS), Infosys, HCL, and Cognizant located in the city. In addition, there are around 110 IT Parks, each housing several software companies. The State of Tamil Nadu accounts for around 11% of the total IT sector investment, ranking third in the country. The state has close to 1,800 registered software units, a majority of which are in Chennai, providing employment to about 375,000 professionals. In the early 2000s, fueled by the IT companies, many ITES ventures were set up to provide business process outsourcing (BPO) services in Chennai, such as Allsec Technologies and Prodapt. More recently, Chennai has emerged as the hub for Software as a Service (SaaS) start-ups. SaaS is a software distribution model in which applications are hosted by a service provider and can be accessed by the user through the Web using an Internet enabled device.

Several SaaS start-up companies such as Fresh Desk, Zoho, ChargeBee, Indix, Zarget, and Orangescape have been set up in the city and have received large venture capital funding. For instance, Fresh Desk is among the top three global SaaS-based consumer support service utilities and was valued at nearly $500 million when it raised funding in April 2015.

KEY DOMAIN: THE MOVIE INDUSTRY (KOLLYWOOD)

India produces the largest number of movies in the world. Chennai has the second biggest movie industry in the country and Tamil (the local language of Chennai) cinema represents 36% of box office revenues. Chennai's movie industry is known by the moniker of Kollywood to rhyme with the capital of the U.S. movie industry, Hollywood.

Movies have had a significant influence on the people of Tamil Nadu State. For example, all the last four chief ministers of the state were from the film industry. In general, there is a strong movie-going culture among the residents of Chennai.

As the hub of the South Indian film industry, Chennai boasted every facility that was needed for movie making: production and recording studios, processing centers, technicians, artistes, and so on. There are close to 50 film production and 100 sound editing companies in Chennai. From 80 to 100 films a year a decade ago, production has doubled to more than 200 films annually due to the digitalization of film making. Figure 1 shows the number of Tamil films released in Chennai over the years.

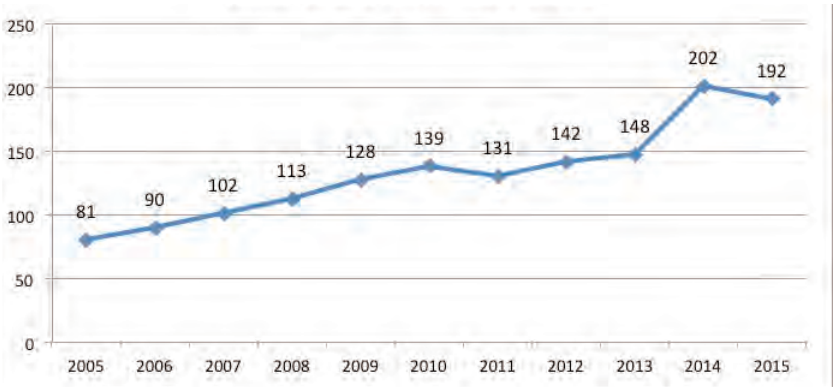
In keeping with the trend in film releases, the number of movie theaters and multiplexes in the city has also increased over the years with more and more people heading to the movies. According to CinemaDB, there are 237 public screens in Chennai city with an average of 436 seats per screen, reaching a total of 103,332 seats. Reportedly, Chennai also has the highest per-screen occupancy in the world, between 80% and 85%, as compared to between 40% and 50% in other Indian cities such as Delhi and Mumbai, and around 25% in the U.S.

The concept of ventures is fairly new in the movie industry, which is known for raising capital through the informal and gray markets. However, in recent years several ventures have been founded such as Real Image (digital technology for movie production and exhibition); Reel Box (content and delivery of movies to handheld devices using advanced technology); and Magzter (global digital newsstand, which started as a movie content portal).

These ventures have played an important role in introducing process and service innovations to the movie industry in Chennai.

Figure 1: Number of Tamil films released in Chennai

Source: Author analysis



KEY DOMAIN:
THE MUSIC INDUSTRY (MARGAZHI MUSIC FESTIVAL)

Chennai hosts the world's largest music festival during the months of December and January. Close to 3,500 concerts are held during the eight-week period in various forms of classical music and dance. Hundreds of artists are involved in these concerts which are held throughout the day in various locations in the city.

Chennai has a good ecosystem for training and learning classical art forms. There are about 25 musical and classical dance institutions of higher learning in the city, which produce about 1,500 graduates annually in various disciplines of these art forms. Almost all the leading music and dance artists are based in the city and conduct music and dance classes. Many artists flock to Chennai because it provides more opportunities than any other city to exhibit their talent.

Traditionally, the growth and sustenance of the classical music form has been largely undertaken by the "Sabhas," essentially non-profit trust organizations supported by philanthropists and patrons of classical music. While the Sabhas are funded by memberships and also from ticket sales to concerts, they are predominantly dependent on patronage from local business houses and other philanthropists.

While the Sabha culture helped to give a fillip to creative endeavor, the conservative and purist mindset did not lead to a significant increase in public discourse in classical music. In recent years, young members of the music fraternity have made bold attempts in adopting a venture approach to embark on new initiatives in the area. Examples include Rhapsody and Do Padu (see text).

Using a venture approach has brought a dose of dynamism, accountability, and importance of growth to a sector where the venture model is seldom used.

KEY DOMAIN: THE "MECCA" OF HEALTHCARE

India is one of the leading destinations for affordable medical treatment, and its medical tourism market is expected to more than double in size from $3 billion (at present) to around $8 billion by 2020, according to a 2015 Confederation of Indian Industries Report. Within India, Chennai has emerged as the most preferred destination for medical tourists and attracts about 40% of the country's domestic and international medical tourists. The city has approximately 158 hospitals including around 40 specialty hospitals.

Chennai has this preferred destination status primarily due to low costs, quality, and specialized treatment. The rates for some surgeries are estimated at one-tenth of their cost in the U.S. and Western Europe. Tourists come to Chennai for specialized treatment related to orthopaedics, cardiology, oncology, pediatrics, and neurosurgery.

Hospitals in Chennai also have excellent success rates. For instance, with respect to cardiac bypass surgeries, Apollo hospitals have a 99.6% success rate. Other reasons include: little to no waiting period, excellent facilities, and well trained doctors. The quality of health care is also very good. For instance, about 15 hospitals in the city have been accredited to the National Accreditation Board for Hospitals and Healthcare Providers (NABH). A few hospitals such as Apollo hospitals are also accredited to the Joint Commission International (JCI) which is considered the "gold standard" in global health care.

Chennai leads the country in organ donations and cadaver organ transplants. In 2014, 155 deceased organ donors gave new life to more than 500 people in the state. The Chennai police have also been actively involved in this program by creating "green corridors" (a special route where all street signals between the donor and the patient are manually turned to green) to enable quick movement of organs from donor to patient.

Given the robust growth of healthcare, several ventures have been set up in this area. These include hospitals such as Medfort Hospitals; specialized healthcare centers such as Perfint Healthcare; dedicated health insurance companies such as Star Health Insurance; diagnostics and testing start-ups such as TechMed Health Centre and Diagnostics, and so on.

KEY DOMAIN: THE "DETROIT" OF INDIA

India is a global manufacturing hub for automobiles and produces around 23.37 million vehicles a year, accounting for 7.1% of the country's GDP. Chennai has the sobriquet of the "Detroit of India" and it accounts for 60% of the country's automobile exports and a compounded annual growth rate of 30% from 2010 to 2015.

Several multinational companies such as Ford, Hyundai, Nissan, Yamaha, BMW, Renault, Mitsubishi, Ashok Leyland, Hindustan Motors, Royal Enfield, Daimler, and TAFE Tractors have manufacturing facilities around the city. Chennai's annual installed production capacity for automobiles is about 1.4 million cars and about 350,000 commercial vehicles each year.

The large number of manufacturing units has resulted in a thriving auto components and tyre manufacturing industry in the city and in the state of Tamil Nadu. Tamil Nadu has the largest auto components industry base in India, and three large Chennai industrial groups make more than 22% of India's auto components production. The large SME segment in Chennai can be attributed to the large automobile companies located around the city.

Over time, ventures in the sector have grown (for example, Sona Koyo Steering Systems Limited) to become well-respected large companies in the sector. New ventures such as Ather Energy (electric two-wheeler start-up) and Planys Technologies (remotely operated underwater vehicles) can also be traced to the strong presence of large automobile companies in the city.

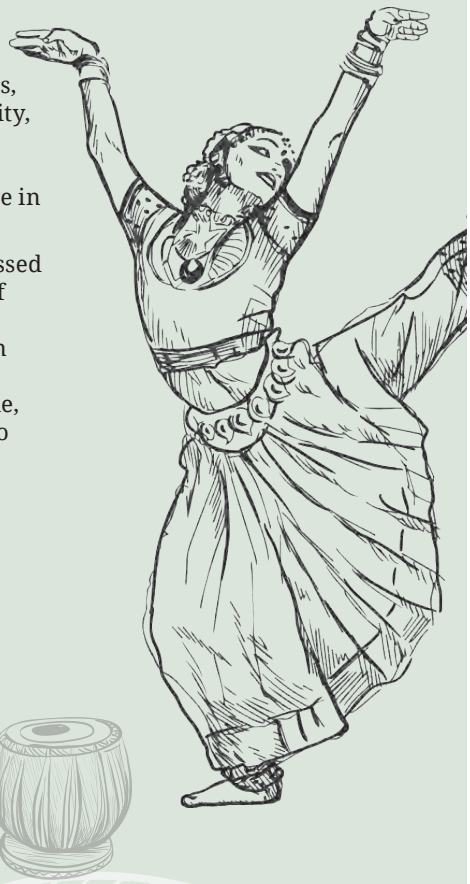
Conclusion

The bold pronouncement by the prime minister on India's Independence Day in 2015 to encourage start-ups signals the clear intent of the policy thinking at the highest level. The role of start-ups and ventures in economic growth has been recognized. Given that most of the ventures are located in large cities, they can play an important role in the urban economy. This article highlights the role of ventures in strengthening the economic and social fabric of a city like Chennai.

The leader in terms of number of SMEs, Chennai is transitioning to being a city of ventures as young people are increasingly taking to starting growth ventures rather than the traditional SMEs. An important contribution of ventures to Chennai has been to strengthen the sectors that the city has been traditionally known for.

In IT and software services, healthcare, movies and music, and automobile sectors, ventures have augmented existing capacity, pushed forward industry frontiers, introduced new processes to bring about greater efficiency, and facilitated a change in mindset by breaking new ground.

The power of ventures can also be harnessed in the social sector as several examples of impact ventures indicate. Ventures have demonstrated the ability to achieve depth impact, offer niche services that public agencies themselves are unable to provide, and design technology-driven solutions to enhance the delivery of civic services.



FURTHER RESOURCES

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Series Editor
Thillai Rajan A.
Professor
Department of Management Studies
Email: thillair@iitm.ac.in

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Indian Institute of Technology Madras

CHENNAI, 1998–2015
FROM THE EPICENTER OF SMALL BUSINESS TO VENTURE

civ.global/chennai

Thillai Rajan A.
Professor, Indian Institute of Technology Madras and International Research Affiliate, Coller Institute of Venture

Vikram Kapur
Principal Secretary, Industries Department, Government of Tamil Nadu

Inhabitants: 4.65 million (2011 Census). The decadal growth in the population of Chennai during 2001–2011 was 7.8 percent.

The Geographical, Economic, and Political Context

- The City of Chennai, with an area of 426 km^2, is the capital of the South Indian State of Tamil Nadu. The city is the fourth-largest city in India and the 31st-largest metropolitan city in the world.
- The economy of the city is the third-largest in India, with a GDP of US$66 billion and a per capita GDP of US$1,870. Tamil Nadu is traditionally known as a forward-looking and industrialized state with a socially conscious population. It has the largest number of SMEs in India and the government has set up various agencies to facilitate SME growth.
- The local government of the city is the Greater Chennai Corporation, said to be the second-oldest city corporation in the world after that of London. The corporation, along with other utility agencies, is responsible for providing various civic services in the city.

Anchor Institutions

- Indian Institute of Technology Madras (IITM): Has a network of four incubators on its campus. Together, these incubators have incubated 102 ventures, 30 of which have raised total investment of more than US$90 million from various angel investors and VC firms.
- The Chennai Angels: The angel network platform established in 2007 has invested more than US$8 million in 34 companies. In 2016, the total number of investors in its network was 96.
- The Indus Entrepreneurs (TiE), Chennai Chapter: Is part of the global TiE network and is engaged in fostering the spirit of entrepreneurship through mentoring, networking, and education. TiE Chennai has 165 Charter Members and close to 700 Associate Members.
- The Start-up Centre: A leading incubation-cum-accelerator set up to address the requirements of the modern start-up. Works with more than 1,000 entrepreneurs each year through various programs and informal meets. This has resulted in the formation of an informal start-up hub in Chennai.

Venture Statistics

As of October 2016, out of a total of 13,957 start-ups registered in LetsVenture, India's largest start-up funding platform, 505 are from Chennai. There are 23 incubators in Chennai. There were more than 250 venture-funded companies in Chennai during 2000–2015, resulting in an investment flow of about US$1.2 billion (in 2015 values).

Strengths

- Stable political climate: In general, the living conditions of the city are peaceful, and the law and order situation is considered to be excellent.
- Human resources: The literacy ratio of the city is 90.23%, indicating a fairly high level of education. People are well educated, especially in technical fields.
- Infrastructure: The city has a strong infrastructure, with an international airport and several ports, and is well connected with the rest of country through rail and road network.
- Industrialization: The state is well industrialized and has traditionally been known for its strengths in manufacturing.

- Cost: A significant advantage is the low cost of living in the city. The 2016 cost of living plus rent index for Chennai is 17.2, whereas for other large cities in India, such as Bengaluru, Delhi, and Mumbai, it is 18.33, 19.85, and 25.68 respectively.

Weaknesses

- Mindset: Chennai is known as a "conservative" city compared to the other metropolitan cities in India.
- Investors' conservatism: Compared to other major cities, average angel round investment in Chennai is the lowest at US$0.44 million and the average age of the start-up at the time of receiving angel funding is also the highest (3.37 years).
- Transition of SME policy to suit a venture environment: While the SME policy and framework of Tamil Nadu has led to a leadership position of the state in the segment, there has been a lag in translating this leadership in the creation of ventures.
- Technological reputation: Despite the presence of a number of IT companies, Chennai is not as well-known as a technology hub as Bangalore, which is home to several multinational technology companies such as Intel, Texas Instruments, Google, among others.

Ecosystem Players

- Incubators and accelerators in several universities, research institutions, and in the private sector.
- Angel and venture investors such as Chennai Angels, Keiretsu Forum, Ventureast, TVS Capital, Fulcrum Ventures, Peepul Capital, among others.
- Government organizations such as Small Industries Services Institute (SISI), Entrepreneurship Development Institute (EDI), Small Industries Development Corporation (SIDCO), and Tamil Nadu Industrial Investment Corporation (TIIC).
- Start-up networks: Community meet-ups such as Chennai Open Coffee Club; Chennai Geeks; community initiatives such as madrasmade.net; prototyping events such as HasGeek Hacknights, In50hrs, among others.

Strategies Employed

- Celebrating and recognizing entrepreneurship success: TiE Chennai and the Confederation of Indian Industry bestow awards on entrepreneurs in various categories.
- Networking forums for entrepreneurs to learn and interact with each other: TiE Chennai hosts more than 80 other events annually, with an aggregate attendance of more than 10,000.
- Government support to start-ups: The Government of Tamil Nadu sponsored one of the earliest state venture funds to support start-ups in Information Technology and Biotechnology start-ups. In 2016, the New Entrepreneur-cum-Enterprise Development Scheme was formulated in order to provide capital subsidy and soft loans, as well as training around 1,000 entrepreneurs.
- Start-up warehouse: The Information Technology Department of the Government of Tamil Nadu has approved the setting up of a start-up warehouse in Chennai in partnership with NASSCOM, the industry body for software services, to promote new ventures.

Results

Chennai has not been able to effectively transition its leadership position in the SME segment to the creation of business ventures. There was not much difference between the numbers of start-ups funded in Chennai and those in India's other metro cities in the early 2000s. However, since then there has been a substantial drop in the number of ventures funded in Chennai compared to that of the other major cities.

Lessons and Conclusions

The experience of Chennai city shows that

- The ecosystem for innovation and technology-led ventures are significantly different from those of SMEs. A policy framework for start-ups should recognize this difference.
- While all the ingredients of the start-up ecosystem may be present, they must be attuned to the needs and aspirations of modern-day start-ups and ventures.

More details of the initiatives taken by IITM to support ventures in Chennai are available in Issue 4 of Coller Venture Review, dedicated to University Venture.

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IMPLEMENTATION OF A HEALTH IT CLUSTER IN NEWARK, NJ

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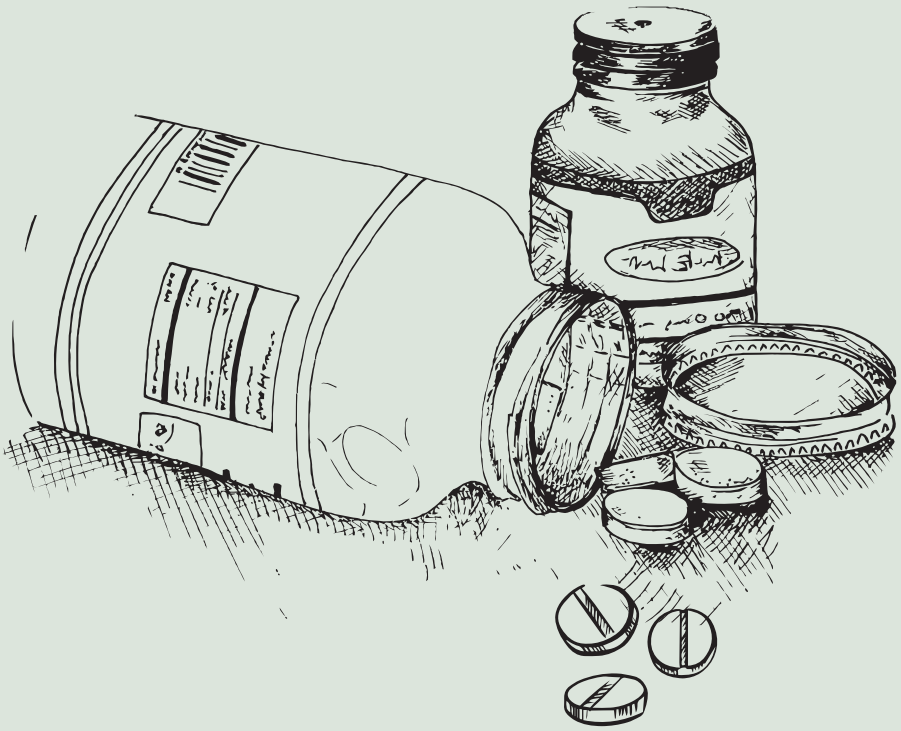
Michael Ehrlich
Associate Professor and Co-Director of the NJ Innovation Acceleration Center, Martin Tuchman School of Management, New Jersey Institute of Technology



Introduction

In order to stimulate regional economic growth, many government policymakers have adopted cluster development strategies to emulate Silicon Valley, Boston's BioTech Hub, New York's Financial District, and other successful industry clusters. The goal is to establish a group of firms with related and supporting industries and institutions that are located near to one another and that strengthen one another through their mutual interactions and relations.

MANY GOVERNMENTAL POLICYMAKERS HAVE ADOPTED CLUSTER DEVELOPMENT STRATEGIES

However, these cluster development efforts have had only limited success as policymakers and practitioners have struggled to enhance economic development and employment growth within their urban cores.

In a related effort to stimulate employment growth, policymakers, practitioners, and academics have recognized that the rapid introduction of technological innovations since the 1980s fosters the generation of wealth and employment through the creation of new firms. In order to increase the population of new firms within urban centers, substantial public and private investments have been made to establish business incubators, accelerators, science parks, and co-working spaces. However, these institutions also remain little understood without an agreed underlying theoretical framework or established metrics for evaluation.

In this article, we propose to extend the cluster development theory introduced by Michael Porter (1990) to explain the competitive advantage of nations to incorporate the local institutions that we call business incubators, accelerators, science parks, or co-working spaces. We will explain why we may characterize these institutions as hyper-local clusters, then present an example of hyper-local cluster development with implications for broader cluster development.

1. Business Incubation

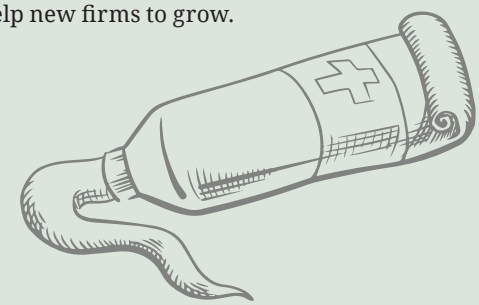
The National Business Incubation Association reports that in 2012 there were more than 1,250 incubators in the U.S., up from only 12 in 1980. Internationally, thousands more incubation initiatives have recently been established in Europe and Asia. Many more accelerators, science parks, and co-working spaces have also recently been established.

There is substantial diversity in the institutions that are called incubators, accelerators, science parks and co-working spaces. Most incubators and science parks include medium- to long-term occupancy relationships of two years or more. Some incorporate equity investments, while many in the U.S. are better characterized as rental relationships, but often include additional specialized services for start-up companies.

Many accelerators or co-working spaces are short-term arrangements of 8–16 weeks, renewable in the case of co-working spaces, and most accelerators in the U.S. include equity investments. For this article, we are going to call all of these institutions "incubators."

In all cases, these incubators host a community of start-up firms, often with networking or shared common spaces. They typically have four common elements: shared office space, shared support services, business support and coaching, and networking. Some researchers have hypothesized a "networked incubator" which fosters "territorial synergy, relational symbiosis, and economies of scope" based on network theory and social capital theory.

Within the academic literature, no systematic framework has been developed to help understand business incubators. Regarding the performance of extant incubators, there has been a paucity of data and a lack of clarity. We will adopt cluster development theory as a framework to describe how incubators perform as hyper-local clusters to help new firms to grow.



PORTER'S CLUSTER DEVELOPMENT THEORY

Michael Porter's cluster theory is based on the determinants of national advantage which he describes as an interrelated diamond linking factor conditions, demand conditions, related and supporting industries, and firm strategy, structure, and rivalry (See figure 1). While his theoretical discussion is applied to the nation or regions as home base, we find these elements are equally applicable to incubators.

The factor conditions describe the firm endowments of financial capital, infrastructure, physical resources, human capital and intellectual capital (especially scientific know-how, including intellectual property, and resources such as universities). Notably, clusters succeed in industries where they are particularly good at attracting, creating, and upgrading factors.

Demand conditions are improved if the buyers are local, as firms can gain a clearer picture of buyer needs than for rivals. Firms are more likely to be sensitive to nearby needs and can be responsive to them at lower cost, so early sophisticated and demanding customers can drive innovation.

Close working relationships with related and supporting industries and institutions can help firms to discover new methods and provide opportunities to apply novel technologies. By exchanging ideas, and through joint efforts, suppliers can drive faster innovation. Suppliers can also transmit best practices, while proximity shortens communication lines.

Among the strongest drivers of innovation and economic success are the healthy strategic rivalries that can develop among related local firms. Successful firms model management practices and professional standards that are intangible assets for economic development. The existence of competitors can not only feed the innovation process but also support the adoption of novel products or services by buyers.

These determinants work together to foster the development of competitive firms. While we expect resources to flow where productivity is highest, technology-based firms can boost productivity by their commitments to the development of new knowledge.

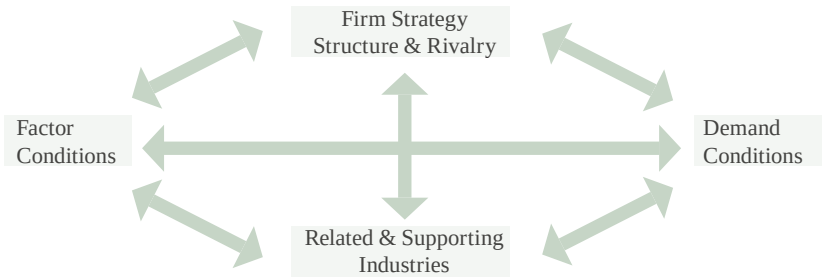
Porter describes the ideal process as one of adjustment of committed resources to boost productivity, which mimics the language of start-ups that pivot to improve their value.

Porter's diamond is a dynamic system that drives firms to achieve competitive advantages. A well-functioning cluster stimulates local governmental and educational institutions to invest in relevant factor creation and specialized infrastructure. Cause and effect can be hard to determine within the complex interplay among the determinants of the diamond.

In a recent work, Delgado, Porter, and Stern (2014) empirically examined cluster performance at the macro level and found evidence of the duality between employment and innovation productivity. They also point out the need for new studies to explore the central role of specialized local institutions, which allow complementarities to be realized. They note that little theoretical or empirical research has examined the role and impact of these localized institutions, which we are calling business incubators.

Figure 1: Porter's Determinants of National Advantage Diamond

Source: Michael Porter, "The Competitive Advantage of Nations"



2. Hyper-Local Clusters

Based on Porter's theory, clusters have been recognized as the key organizational units for enhancing economic and employment growth within regions. Typically, clusters have been recognized as macroeconomic determinants of economic performance. Clusters have been associated with geographical regions and groups of firms that are vertically and horizontally aligned. The competitive advantage of clusters has been based on technology, knowledge, and other factor endowments such as labor market conditions or climate.

URBAN PERFORMANCE IS GOING TO BE DRIVEN BY CLUSTER PERFORMANCE WITHIN THE CITY

But the foundation of a successful economy is based on groups of micro structures that work together to create macro scale benefits. We identify hyper-local clusters as the microeconomic foundations of macro scale cluster effects. We focus on a particular form of hyper-local cluster where early stage firms cluster together in incubators because each firm benefits from being proximate to other similar firms. Clustered firms have common competitive strengths and needs.

Thinking of incubators as clusters is valuable because it redirects economic policy toward consideration of groups of firms and away from individual firms. By solving group problems such as training or key infrastructure needs, one public investment can create many benefits as a public good. Economic development resources can be maximized by redirecting them from providing benefits to individual firms toward hyper-local cluster development investments.

By recognizing that urban performance is going to be driven by cluster performance within the city, cluster thinking drives policy makers to enhance existing strengths and to develop critical mass as strategies for economic development. In order for cities to be successful in cluster development, they need to focus on their own unique strengths rather than on trying to mimic the characteristics of another region.

While there is no "one size fits all" formula for cluster development, enhancement of Porter's determinants will foster growth, while identification of the common elements needed by cluster members will lead to the most productive investments.

Rather than attempting to create a de-novo cluster, policy makers should promote and maintain the green shoots that already exist within their cities. Cluster policy should not be about picking winners, but should rather focus on enhancing existing industries.

3. Implementation of a Health IT Cluster in Newark, NJ

The New Jersey Institute of Technology was one of the early adopters of economic development as a core component of its academic mission. Located in Newark, NJ, an urban community hard hit by the economic hollowing out of urban centers, the university has been a longtime advocate of economic revitalization, working with the city, private industry, and other academic partners.

A critical component of NJIT's economic development mission has been its support of technology-based entrepreneurs and the growth of the overall entrepreneurial ecosystem in Newark and New Jersey. In 2014, NJIT created the New Jersey Innovation Institute (NJII) as a separate 501c3 to follow industry-led agendas, designed to spur product creation and enhancement, develop solutions for sector-wide and/or company-focused challenges, and serve as a catalyst for regional economic growth.

NJII's suite of services leverage and support partnerships between government, industries, other universities, and laboratories, and are targeted to fill New Jersey's technology development gap. The Enterprise Development Center (EDC) incubator program is an element of the NJII.

One of the inaugural grant recipients supported by the JP Morgan Chase Small Business Forward[SM] initiative is a Health IT Cluster Development program known as the NJIT/NJII Health IT Connections program. The multi-year Small Business Forward[SM] program was designed to boost small business networks that help growing enterprises within target industries. The

program connects entrepreneurs with critical resources to help their businesses to grow, create jobs, and strengthen communities.

The EDC has more than 90 hi-tech and life science start-up and graduate companies located in 100,000-plus square feet, with more than 800 employees. The EDC is already the largest hi-tech incubator in the region and is a logical resource for the Health IT Connections program, building on existing strengths.

THE GOAL OF THE PROGRAM IS TO HELP ENTREPRENEURS SHIFT FROM START-UP TO SCALE-UP PHASE

The Health IT Connections program targets growth stage Health IT entrepreneurs who have achieved initial market traction. Notably, participants enter the program with a developed product/service, existing customers, and trailing 12-month revenues (typically between US$250,000 and US$5 million). The goal of the program is to help these entrepreneurs shift from start-up to scale-up phase, with dramatic improvements in their revenue and employment growth rates.

Health IT at NJIT

With healthcare undergoing a massive transformation, healthcare information technology (IT) innovations are critically needed in order to reduce healthcare costs and improve healthcare outcomes. Through the strategic use of healthcare IT technology, existing investments in electronic health records (EHR), and related innovations, the country can revolutionize the way healthcare organizations deliver services.

Newark is a regional hub and New Jersey's largest city. The region is already a dynamic cluster for pharmaceutical and medical device technology and, together with the NYC region, is an important center for hospitals engaging in medical research and education. In addition, NJIT, which has the affiliation of more than 9,000 physician members of the regional extension center (NJ Hi-Tec), was awarded a US$23 million federal grant in 2010 to help primary care physicians adopt meaningful use of EHRs.

NJIT hosts the health-e-cITies network, which is designed to seamlessly integrate all regional healthcare participants, incorporating eight hospitals, primary care physicians, specialists, payers, clinical labs, pharmacies, public health systems, and patients. In 2015, NJIT was awarded a US$50 million grant from CMS (Center for Medicare and Medicaid Services) to facilitate practice transformation.

With these assets, the Health IT Connections program builds upon existing strengths and can integrate valuable innovations into a very receptive environment. Growth stage Health IT companies add critical mass to the establishment of a vibrant Health IT cluster in the region.

Health IT Connections Program

Selected Health IT entrepreneurs participate in an intensive structured learning program consisting of group classes and peer support activities. These are busy CEOs running operating businesses, so we need to offer them very valuable services to get them to spend time away from their businesses. They are provided specialized training on business model development and customer discovery to help them accelerate the commercialization of their technology and achieve their full potential for the facilitation of high growth.

The Health IT Connections leadership team recruits 10 to 15 companies each half-year (25/year) in cohorts that allow them to share and learn from their peers. While initially some are fearful of potential competitors, they discover that they are stronger together and often team up during their sessions so that they can jointly approach larger potential customers. Cohort companies are introduced to related and supporting industries offering specialized legal, marketing, accounting, and funding services.

As the cohorts progress, they are exposed to subject matter experts and provided with introductions to potential key partners/customers from regional hospitals, pharmaceutical, medical device, insurance, and other related areas. After the initial 12-week Growth Strategies sessions, the cohort companies join the full cluster where they interact with earlier cohorts and the broader community of medical and health IT professionals who attend these regular events.

Events focus on themes relevant to participants, allowing them to develop strategic partnerships with important customers and funders. In addition to regular showcase events, Health IT Connections conducts periodic connection match and peer networking functions to facilitate their ongoing engagement and to continue building their social capital. Over the last year, its cohort companies participated in 19 events throughout the region (nine at NJIT) with between 75 and 500 attendees.

Early Results

For the first two years (2014:H2–2016:H1), the Health IT Connections program attracted 50 growth-stage Health IT companies as members of the company's cohorts #1–#4. The figures below characterize them by number of employees and revenue when they joined.

The 50 cohort companies averaged 12 employees, US$1.04 million/year revenue, and were six years old when they joined the program. Their sector focus areas were:

- Cloud Services
- Data Analytics
- Mobile Communications
- Telehealth
- Patient Wellness
- Wearable Devices
- Software Consulting
- Medical Diagnostics
- Medication Adherence
- Education/Training
- Cyber Security

Since joining the program, the average annualized revenue growth rate was 45.8% and the annualized employee growth rate was 41.6%, for the reporting companies. These growth rates imply the creation of more than 300 new jobs and almost US$30 million in new revenue for the 50 participating cohort companies.

Figure 2: Employee Profile of Health IT Cohort Companies, 2014:H2–2016:H1

Source: Author analysis

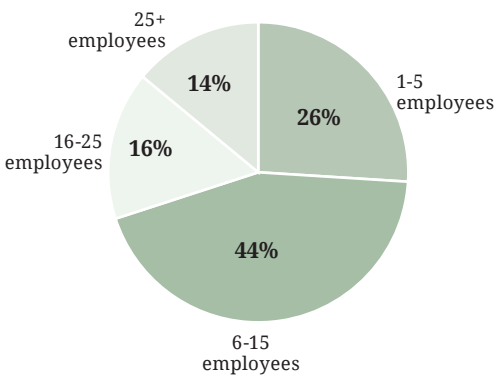


Figure 3: Revenue Profile of Health IT Cohort Companies, 2014:H2–2016:H1

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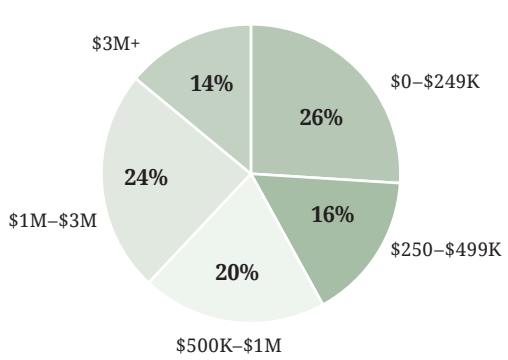

Conclusion

Policymakers and economic development professionals should seek to strengthen and expand nascent clusters within their cities as they seek to enhance economic and employment growth. They should look to their existing strengths and foster the development of hyper-local clusters within business incubator eco-systems to encourage the development of entrepreneurial firms. The small firms can help establish the critical mass needed to derive the benefits from being located near other firms with similar competitive strengths and needs.

The experience of Newark, NJ, where the New Jersey Institute of Technology teamed up with JP Morgan Chase to foster the burgeoning Health IT clusters in the region, demonstrates that the development of hyper-local clusters within a business incubator eco-system can enhance both revenue and employment growth for the participating firms, and strengthen urban areas by creating high-quality jobs.

FURTHER RESOURCES

Bollingtoft, A., & Ulhoi, J. P. (2005). The networked business incubator – leveraging entrepreneurial agency? Journal of Business Venturing, 20: 265–290.

Delgado, M., Porter, M. E., & Stern, S. (2014). Clusters, convergence, and economic performance. Research Policy, 43: 1785–1799.

Haltiwanger, J., Jarmin, R., & Miranda, J. (2009). Jobs created from business startups in the United States. Kauffman Business Dynamics Statistics Briefing, Kauffman.org.

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Global Corporate Venturing

NEWARK NJ, 2014–2016 IMPLEMENTATION OF A HEALTH IT CLUSTER

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Michael Ehrlich
Associate Professor and Co-Director of the NJ Innovation Acceleration Center, Martin Tuchman School of Management, New Jersey Institute of Technology

Inhabitants: 277,140

The Geographical Context

Newark is the largest city in New Jersey and the Essex County seat. It is a major logistics hub for air, rail, and roads. It is the second largest city within the NY Metropolitan Region (after NYC).

Relationship with Government

As an urban community that was hard hit by the deindustrialization and economic hollowing out of urban centers during the 1960s, the city has a robust infrastructure. to support a growing entrepreneurial ecosystem with extremely high levels of fiber-optic capacity.

Anchor Institutions

- New Jersey Institute of Technology, Rutgers, Rutgers Medical School, Essex County College, Seton Hall Law School, and other higher education institutions.
- JP Morgan Chase – Small Business Forward Initiative, Prudential Insurance, Panasonic U.S. HQ, PSE&G, Audible.com, and other major corporations.

Venture Statistics

Overall, Newark has declined since the 1950s when it was a major manufacturing, retail, and transportation hub. While the population has been relatively steady over the last 20 years, the Newark population is down over 35 percent from 1950. Per capita income in Newark is among the lowest for New Jersey and ranks 693rd out of 702 NJ communities at US$13,009 (2010 Census). More recently, Newark has attracted new investments, especially in the downtown area, and has begun to develop an entrepreneurial ecosystem. The Health IT Connections program supports and builds on this nascent ecosystem.

For the first two years, the Health IT Connections program recruited 50 growth-stage Health IT companies as members of the first four cohorts. The figures below characterize them by number of employees and revenue when they joined the program.

Across the 50 cohort companies, they had an average size of 12 employees, US$1.04 million/year revenue, and were six years old. Their sector focus areas were:

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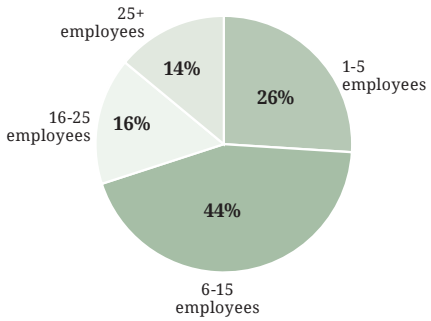

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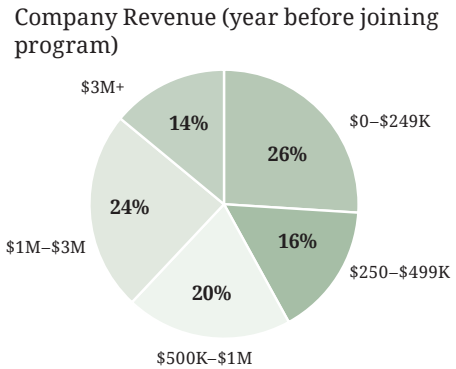

- Cloud Services
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- Software Consulting
- Medical Diagnostics
- Medication Adherence
- Education/Training
- Cyber Security

For the reporting companies, the average annualized revenue growth rate was 45.8% and the annualized employee growth rate was 41.6%.

Strengths

- Newark's infrastructure is highly developed with extensive transit, including mass transit options, and extensively developed but underutilized real estate assets.
- Newark has the highest density of known fiber optic capacity in the U.S.
- Proximity to New York City and international airports.

Weaknesses

- The reputation of Newark lags behind the reality and reflects the unrest from the 1960s.
- Schools and public safety are concerns.
- As a poor urban center, many residents have limited education and weak job skills.

Ecosystem Players

- The downtown area has many major corporations and law firms, including Prudential Insurance.
- The University Heights neighborhood is home to four universities – NJIT, Rutgers, Essex County College, and Rutgers Medical School – where the students and faculty represent largely untapped resources for the city.
- Recent entrepreneurial entrants include co-working spaces (= space and Fownders) as well as a new social venture fund (Newark Venture Partners).

Strategies Employed

- At NJIT, the New Jersey Innovation Institute and the Enterprise Development Center foster innovation and new venture formation.
- The NJ Innovation Acceleration Center manages the NSF I-Corps Site program and sponsors the student entrepreneurship club and Newark Innovation Acceleration Challenge business model competition.
- Rutgers houses the Center for Urban Entrepreneurship and Economic Development.
- Several of the new participants are establishing accelerators and training programs and creating new spaces for entrepreneurs, all of which can be considered new hyper-local cluster development activities.

Results

The region is developing an entrepreneurial ecosystem and attracting new resources as existing and new participants are able to promote the opportunities available for start-ups. New real estate developments by Prudential, NJIT, and other regional developers are filling the skyline. New start-up communities and co-working spaces are sprouting and supporting early-stage firms. The City of Newark has leveraged its infrastructure, especially fiber optic capacity, to establish Smart City Newark. New educational efforts are expanding technology education to Newark public school children who could be future employees of new tech-based businesses.

Lessons and Conclusions

- Policymakers and economic development professionals should strengthen and expand nascent clusters within their cities as they seek to enhance economic and employment growth.
- City managers should look to their existing strengths and foster the development of hyper-local clusters within business incubators to encourage the development of entrepreneurial firms.
- Small firms and incubators can help establish the critical mass needed to derive the cluster benefits from being located near other similar firms.
- The experience of Newark, NJ, where the New Jersey Institute of Technology has teamed up with JP Morgan Chase to develop a Health IT cluster, demonstrates that the development of hyper-local clusters within a business incubator can enhance both revenue and employment growth for the participating firms and strengthen urban areas.

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THE “TECH” OF TWO CITIES

WHY HONG KONG FAILED WHERE SHENZHEN SUCCEEDED

Horace Yeung
Assistant Professor,
University of Leicester

Flora Huang
Associate Professor,
University of Essex

Shenzhen Special Economic Zone is an experiment…we want it to succeed, but if it fails, it is still a valuable experience

— Deng Xiaoping, June 29, 1985

Hong Kong's prosperity and stability is closely associated with China's development strategy

— Deng Xiaoping, June 3, 1988

Introduction

Shenzhen used to be a tiny town of around 30,000 people, north of the then prosperous British colony, Hong Kong, in southern China. The story is certainly entirely different now that Shenzhen is comparable to, if it has not already outshone its once proud neighbor.

Shenzhen's Nanshan district, home to a huge hi-tech industrial park, is now China's richest, with a higher per capita GDP than even capitalist Hong Kong. This article will compare the two cities through the use of CIV City Cases. It will discuss whether the institutional differences can help to explain the respective growth stories of the cities. Afterwards, the article will consider the prospects of the Qianhai Shenzhen-Hong Kong Modern Service Industry Cooperation Zone, a national-level initiative to combine the core strengths of the two cities in an attempt to boost the existing technology center to a new level before a conclusion is drawn.

1. Institutional Differences Between Shenzhen and Hong Kong

Institutions are important for economic growth. The development of Hong Kong's institutions has a close connection with its historical status as a colony of the British Empire, even after the handover. Having a legal system inherited from England is widely regarded as one of Hong Kong's advantages.

The development of company law, which can facilitate the conduct of business, is a good example. Company law is important in two ways. First, it governs the corporate form which provides attractive features such as limited liability to shield the personal liability of investors, as well as the transferability of shares to give investors an exit right. Second, the law provides a clear allocation of rights and control to shareholders so that they are able to protect themselves by, for example, using their decision rights.

SHENZHEN IS COMPARABLE TO, IF IT HAS NOT ALREADY OUTSHONE ITS ONCE PROUD NEIGHBOR

Hong Kong is a clear winner in this regard. The genesis of the current framework was the Hong Kong Companies Ordinance of 1865 which mirrored the English Companies Act of 1862. It has closely followed the English model since then. In sharp contrast, China did not have a proper set of company laws until 1993. Unfortunately, the first company law was primarily aimed at state-owned enterprises but not private economic activities.

The law was generally highly restrictive; for example, it required all share transfers to take place through a securities exchange, which meant that a private non-market transfer between parties was not possible. Also, the law prohibited the directors of a company from transferring their own shares during their term of office, which effectively discouraged senior management of a company from having a financial interest in the company. The law was then amended several times to foster a more functional and friendly regime; for example, in 2013, the law

was revamped to streamline the registration formalities and relax the threshold for setting up a company.

In light of the recent legal reforms, it might be useful to refer to the World Bank's Doing Business Report 2016, which provides measures of business regulations for local companies in 189 economies, to see how China has fared against Hong Kong (see table below). It can be seen that Hong Kong's regime remains better than that of China in all but two important aspects of doing business.

Despite the fact that Hong Kong is still leading in a number of aspects, it is unfair to write off China's efforts in improving its institutional environment through various legal reforms. Poor investor protection may put off potential funders from investing in a venture. In this regard, positive changes in the regulatory framework were witnessed in the revisions to the Chinese Company Law in 2005; for example, companies are allowed to use cumulative voting, thereby empowering minority shareholders to appoint their representatives to the corporate boards.

Table 1: How Hong Kong and China Have Fared Respectively in Different Key Aspects of Doing Business.

Source: World Bank (2016), Doing Business Report

World Bank's Doing Business Ranking of 189 Economies

TOPICS	CHINA'S RANKING	HONG KONG'S RANKING
Starting a Business	136	4
Dealing with Construction Permits	176	7
Getting Electricity	92	9
Registering Property	43	59
Obtaining Credit	79	19
Protecting Minority Investors	134	1
Paying Taxes	132	4
Trading across Borders	96	47
Enforcing Contracts	7	22
Resolving Insolvency	55	26

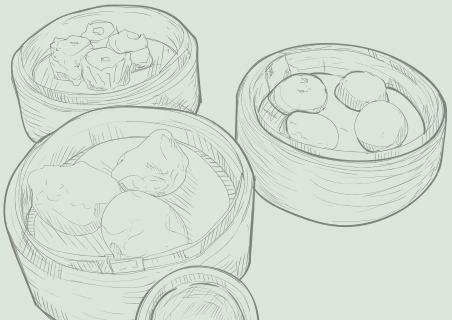
Also, a stricter duty of care is imposed on directors, supervisors, and senior management.

In the case of a dispute, shareholders have express rights to bring a legal action against corporate officers. Academic study has confirmed the significant upward movement in the level of shareholder protection made by China between 1995 and 2005. It is worth noting that law reforms may not necessarily lead to a better outcome (at least in the context of this article). One notable example will be the introduction of Labor Contract Law in 2008.

Following legal moves to enhance labor rights, the rising cost of China's famously cheap labor, the very factor that the country's economic boom was built on, appears to be irreversible. Such a change, which should have been welcomed by workers, means soaring business costs. The effect was immediate. In the first 10 months of 2008, 15,661 enterprises in Guangdong, the province where Shenzhen is located, closed their doors. Foxconn, Apple's supplier, which operates a mega-sized production base with 500,000 employees in Shenzhen, is now in the process of moving some production to India.

Indeed, spiraling business and living costs are the common problem facing the two cities. Hong Kong has been ranked globally as the least affordable city in which to buy a home, with average apartment prices at 19 times gross annual median income, the highest ever measured in the U.S.-based Demographia's survey in the past 11 years.

Likewise, in April 2016 homes in Shenzhen were sold at an average of RMB 49,259 per square meter (or US$690 a square foot), as much as the Rockridge neighborhood in Oakland in the U.S., a pricey part of the San Francisco Bay Area, where home prices average US$704 a square foot. The lack of affordable housing is causing talent and companies to leave or consider leaving for more affordable cities. Ren Zhengfei, founder of Huawei, warned that Shenzhen's housing prices could destroy the city's competitiveness.



2. Rise of the Once Humble Neighbor

In spite of a seemingly inferior institutional environment, it has not inhibited the rise of tech giants such as Huawei and Tencent, whose headquarters are in Shenzhen.

Founded by Ren Zhengfei in 1987, Huawei has grown from a small company with a turnover of just US$5,680 to a global company with a turnover of more than US$39 billion with a business presence in more than 170 countries and a staff of 170,000 in 2014. Huawei is a private business, wholly owned by its employees, with 82,471 employees owning shares in the company. According to the International Data Corporation, Huawei was the third-largest mobile phone manufacturer in the world in 2016, with 9.3 percent of market share, just behind Samsung (22.8%) and Apple (11.7%).

In the case of Tencent, it was founded in 1998 by Ma Huateng and others with the backing of Naspers, a South Africa-based multinational Internet and media group. In 2004, Tencent went public on the Hong Kong Stock Exchange. The company is a leading provider of Internet value-added services in China, and its headquarters is in the Nanshan District of Shenzhen. According to Barron's, in September 2016 Tencent became Asia's largest company by market capitalization.

Despite its success in attracting Tencent to list on its stock exchange, Hong Kong has still had a number of missed opportunities. The Hong Kong Stock Exchange introduced the Growth Enterprise Market (GEM) in November 1999 to provide fund-raising opportunities for growth companies. Companies' abilities to obtain credit are a fundamental factor as to whether they can continue to grow.

Accessing credit has been a significant obstacle for Chinese companies. For example, at the end of 2006, according to the World Bank (2008), smaller businesses which contributed some 60% of China's GDP, accounted for only 15% of outstanding credit, most of which came from banks. This demonstrates the urgent need to diversify the fund-raising channels for these companies. Hong Kong's GEM should have been well placed to capture Chinese businesses. China finally launched its own Growth Enterprise Board (GEB) in October 2009, almost 10 years later than Hong Kong, and quickly outshone its Hong Kong counterpart.

As of now, Shenzhen's GEB has 555 companies, with a total market capitalization of RMB 5,636 billion (US$818 billion), compared to Hong Kong's GEM which has 248 companies, with a combined market capitalization of HKD 289 billion (US$37 billion).

A further missed opportunity is DJI, a market leader in unmanned aerial systems. The founder of the company is Frank Wang, who developed an unmanned miniature helicopter during his studies at the Hong Kong University of Science and Technology. This academic project paved the way for his highly successful business. DJI was estimated to account for 70% of the drone market in 2015. It is fair to say that DJI indeed has roots in Hong Kong despite the fact that the company was founded in 2006 in Shenzhen and then succeeded there.

In the face of some early successes for tech start-ups in Shenzhen, the Hong Kong government started to introduce various policy initiatives to promote technology and innovation. This was in sharp contrast to the non-interventionist philosophy shown by the colonial government, as discussed in the CIV City Case following this article.

A major step was taken in 1999 when the government decided to proceed with the development of a Cyberport on the western side of Hong Kong Island. It was envisaged that upon full development, the Cyberport would accommodate about 130 companies of different sizes specializing in the application of advanced information technology. Simultaneously, a science park was established in Tai Po in the New Territories, with a view to further enhancing Hong Kong's technological infrastructure.

THE CENTRAL GOVERNMENT CLEARLY WANTS TO TAKE THE CITY TO THE NEXT LEVEL

In a 1999 policy address, then chief executive, Tung Chee-hwa, also foreshadowed other initiatives such as the establishment of a HKD 5 billion innovation and technology fund, the Applied Science and Technology Research Institute, and a growth enterprise market on the Hong Kong Stock Exchange.

After more than a decade of operation, former legislator Sin Chung-kai, who had represented the IT sector, reviewed the contribution of the Cyberport and the science park, remarking that "Both projects weren't failures, but I wouldn't say they were huge successes".

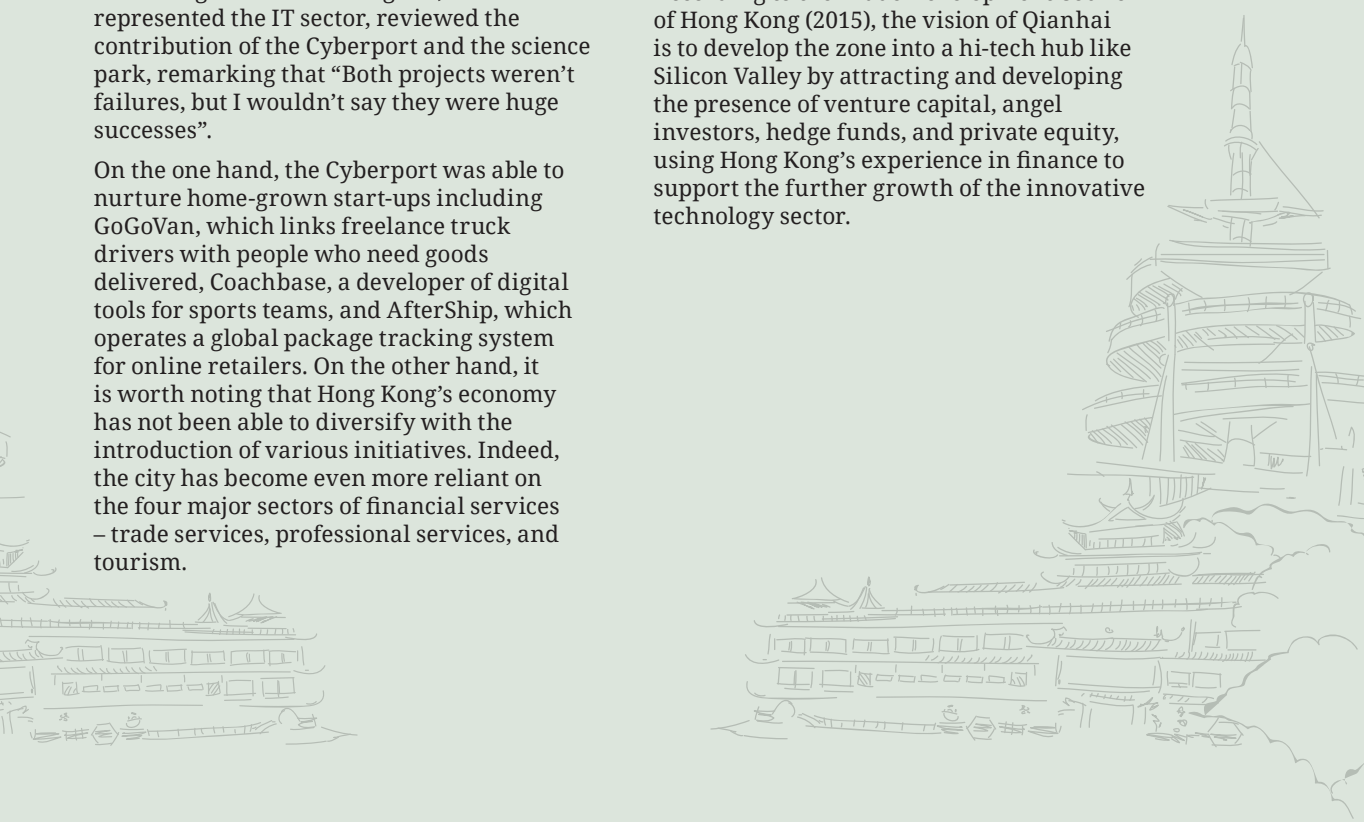
On the one hand, the Cyberport was able to nurture home-grown start-ups including GoGoVan, which links freelance truck drivers with people who need goods delivered, Coachbase, a developer of digital tools for sports teams, and AfterShip, which operates a global package tracking system for online retailers. On the other hand, it is worth noting that Hong Kong's economy has not been able to diversify with the introduction of various initiatives. Indeed, the city has become even more reliant on the four major sectors of financial services – trade services, professional services, and tourism.

3. Potential Synergy of the Two Cities

As discussed in Shenzhen's CIV City Case in this issue, nowadays the city largely owes its success to its Special Economic Zone status and as a symbol of the pioneer in the country's economic reform. The central government clearly wants to take the city to the next level by drawing on the institutional advantages of nearby Hong Kong.

The Qianhai Shenzhen–Hong Kong Modern Service Industry Cooperation Zone (hereafter "Qianhai"), covering an area of 15 square kilometers, is located in the western part of Shenzhen. The concept was first initiated in August 2010 when the Overall Development Plan for Qianhai was released. The State Council affirmed the plan by announcing 22 measures which cover seven main aspects, including finance, tax, law, talents, education, medical care, and telecommunications, for the development and opening up of Qianhai.

The development strategy is twofold. First, preferential policies are granted. Second, the state's intention is to take advantage of the more developed institutions in Hong Kong by forming a collaborative relationship. According to the Trade Development Council of Hong Kong (2015), the vision of Qianhai is to develop the zone into a hi-tech hub like Silicon Valley by attracting and developing the presence of venture capital, angel investors, hedge funds, and private equity, using Hong Kong's experience in finance to support the further growth of the innovative technology sector.



Conclusion

Institutions alone apparently cannot account for Shenzhen's rise. Hong Kong is superior to Shenzhen in terms of the ease to do business. Yet, the technology sector has thrived in Shenzhen but not in Hong Kong. One possible explanation is that talents are not mobile between Shenzhen and Hong Kong owing to border control. Shenzhen can easily draw on talent in a country of 1.3 billion people, but Hong Kong cannot. Shenzhen has arguably been one of the best destinations for budding entrepreneurs in China because Shenzhen is the most "special" among the Special Economic Zones, and Qianhai will be "more special than a Special Economic Zone". Qianhai seems to be a test of the mutually beneficial idea that one city has the innovation while another city has the capability to take it further.

FURTHER RESOURCES

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Shenzhen Stock Exchange: #HOV8165 *in CIV's History of Venture database*

HONG KONG, 1997–2016
A LACKLUSTER PEARL OF THE ORIENT

civ.global/hkg

Flora Huang
Associate Professor, University of Essex

Horace Yeung
Assistant Professor, University of Leicester

Inhabitants: 5 million (1979); 6.5 million (1997); 7.3 million (2015)

The Geographical Context

Hong Kong is located at the mouth of the Pearl River Delta on the coast of southern China, immediately south of Shenzhen. The boundary of Hong Kong has been largely unchanged since it was annexed by the British Empire during the Imperial China era. Addition of land has been achieved through reclamation.

Relationship with Government

On July 1, 1997, Hong Kong became a Special Administrative Region of China. Under the Basic Law of Hong Kong, the city enjoys a high degree of autonomy in accordance with the principle of "One Country, Two Systems." It possesses independent executive, legislative, and judicial powers, but matters such as foreign affairs and national defense remain the responsibility of the Chinese central government.

Hong Kong's legal system remains based on English common law. According to the Basic Law of Hong Kong, the socialist system and policies in China are not practiced in Hong Kong, and the city's capitalist system and way of life are to remain unchanged until 2047. The Law also stipulates that the laws previously in force in Hong Kong, including common law, rules of equity, ordinances, subordinate legislation, and customary law are maintained.

Anchor Institutions

- Financial markets with a long history. Trading in company shares can be traced back to about 1860. One of the largest banks in the world, HSBC, first opened its door for business in Hong Kong in 1865.
- Reliable government system. The World Bank's World Governance Indicators 2015 placed Hong Kong in the top 10 percent in terms of rule of law among 215 countries. Transparency International's Corruption Perception Index 2015 placed Hong Kong 18th out of 168 countries.
- A free port. No tariff is charged on import or export of goods. Further, Hong Kong's capital account is fully convertible, and there are no restrictions on foreign exchange dealings.

Venture Statistics

- GDP per capita in the city rose from HKD 22,860 in 1979 to HKD 211,592 in 1997 and HKD 328,117 in 2015 (The HKD has been pegged at a rate of around 7.8 per 1 USD since 1983).
- There were 474,517 companies in 1997; in 2015, the number rose to 1,288,666.
- Hong Kong is predominantly a service economy. This sector generated 92.7% of GDP in 2014, rising from 67.5% in 1980 and 84.4% in 1996.
- The number of patents granted rose from 2,619 in 1999 to 6,458 in 2015.

Strengths

- Role as regional center. Hong Kong is regarded as a premier commercial and financial center in the region; it is ranked first in the World Competitiveness Ranking 2016 and third in the Global Financial Centers Index of 2015.
- The legal system. Maintaining a legal system inherited from England is widely regarded as one of Hong Kong's advantages.
- Capitalist focus. Another possible explanation for Hong Kong's success is its determination to promote capitalism under colonial rule. Milton Friedman once referred to Hong Kong as the example of capitalism in action, as symbolized by its laissez-faire economic policy. Hong Kong has always tried to

foster a flexible and competitive private sector, and to retain a small government posture.

- The China factor. Owing to the city's geo-political proximity with China, the city's economy has taken advantage of the rise of the Chinese economy by performing roles such as financier, trading partner, middleman, and facilitator.

Weaknesses

- China's interventionist policy. It is believed that Hong Kong's competitive advantages have been slowly eroded under Chinese rule, which has elicited the following media commentaries: "The Death of Hong Kong"; "Is Hong Kong Dying?"; and "An Era in Hong Kong is Ending, Thanks to China's Tight Embrace." One observation is that the government has been becoming more interventionist since the handover, as opposed to its previous positive non-interventionist approach. For example, during the Asian financial crisis in 1998, Donald Tsang, then chief executive, led an unusual plan to buy 11% of the shares on the Hang Seng Index, paying for the move by drawing on foreign exchange reserves.
- Political tensions. The tension between pro-Beijing and pro-democracy groups in the city has increased, as exemplified by the Umbrella Revolution and a related Occupy Central movement in 2014.
- Uncertainty in the future. Political stability is obviously a concern to investors. Confidence in the city has not been helped by the uncertainty left behind by the fact that Hong Kong's special status will only last until 2047.

Ecosystem Players

As mentioned, the "positive non-interventionism" philosophy of the Hong Kong government means that it has not tried very hard to develop the technological sector. However, with the formation of the Innovation and Technology Bureau in November 2015 this is changing. The bureau is responsible for policy matters with a view to transforming Hong Kong into an innovation hub for technology.

Strategies Employed

Milton Friedman described Hong Kong in 1990 as the best example of a free market economy and famously said, "If you want to see capitalism in action, go to Hong Kong. "

Furthermore, family-controlled companies, which are common in Hong Kong, can make efficient decisions owing to a more personalized method of control, with less paperwork and fewer formalities. There is often family dominance in management largely based on personal trust. Frequent family contact limits discussions and negotiations in the organizational setting. This contact facilitates the tacit use of processes through the introduction of norms created by the family.

Results

Hong Kong remains an important center for trade, finance, and business in Asia, strategically located at the doorstep of China's huge and vibrant economy. However, its importance has been overshadowed by the rise of other Chinese cities, most notably Shenzhen and Shanghai in terms of the technology and financial sectors respectively.

Lessons and Conclusions

- Hong Kong has always had a versatile economy. Before the growth and dominance of its financial services sector, international trade had long been a defining characteristic of the Hong Kong economy. Beginning in the 1950s, exports of domestically produced light industrial products served as the engine of growth for nearly three decades. Nonetheless, since the late 1970s, the migration of factories to Mainland China has forced Hong Kong to transform into a service-oriented economy.
- The "One Country, Two Systems" principle, as laid down in the Hong Kong Basic Law, has enabled the city to maintain its institutional advantages after the handover. However, the city's future will largely hinge on how credible the Chinese state is in keeping its promises. The increasing discontent among citizens about the local political environment and the resulting civil unrest certainly cast doubt over the city's future.

SHENZHEN, 1979–2016
FROM LOW-TECH TO HI-TECH

civ.global/shzn

Flora Huang
Associate Professor, University of Essex
Horace Yeung
Assistant Professor, University of Leicester

Inhabitants: 30,000 (1979); 10 million (2016)

The Geographical Context

Shenzhen is a major city in Guangdong Province of southern China, located immediately north of Hong Kong. Its proximity to Hong Kong can explain the city's early rise which was highly successful in attracting investments from Hong Kong.

Relationship with Government

The city was designated as one of the first four Special Economic Zones in the late 1970s and early 1980s. These zones were established to encourage foreign citizens and overseas Chinese and their companies – especially those from Hong Kong and Macau – to open factories and set up enterprises and other establishments there. Preferential treatment was given to these investors.

Anchor Institutions

Shenzhen's Hi-Tech Park located in the Nanshan District has been home to tech giants such as Tencent (established in 1998), ZTE (established in 1985), and DJI (established in 2006).

Venture Statistics

- GDP per capita in the city rose from RMB 606 (around US$260) in 1979 to RMB 160,000 (around US$25,500) in 2015.
- There were only 501 enterprises in 1979; by 2014, the number had risen to 843,977.
- Secondary industries contributed only 20.5 percent of GDP in 1979, but rose to 50% in the 2000s, while tertiary industries contributed to another half of GDP. Here secondary industries refer to mining, manufacturing, production and supply of electric power, water and gas, and construction. Tertiary industries refer to all other industries not included in primary (mostly agricultural) or secondary industries.
- Number of patents granted rose from 160 in 1991 to 53,687 in 2014.

Strengths

- Excellent support from the central government. As part of China's national economic reform in 1978, Shenzhen's Special Economic Zone status had enabled it to gain a first mover advantage over other cities which were opened to overseas investment at a later time. In addition to being granted Special Economic Zone status, Shenzhen has enjoyed symbolic status as the pioneer in the country's economic reform and was famously visited by the legendary Chinese leader, Deng Xiaoping, as part of his Southern Excursion in 1992.
- Foreign investment incentives. The Special Economic Zone status provides foreigners with actual incentives to set up a business there. These include, for example, the preferential rate of income tax of 15%, notably lower than the rate of 20–40% outside the zone. Furthermore, raw and semi-processed materials, machinery and equipment, and other capital goods necessary for production that are imported by enterprises in the zone are exempt from import duties. Also, the lawful profit that an investor receives can be remitted abroad, despite the existence of currency control in China.

Weaknesses

- Inherent weaknesses of the Chinese economy. The city's development may have been hampered by some of China's weaknesses as a developing country. Corruption is still perceived as widespread in China, having been ranked 83rd out of 168 countries by Transparency International in its Corruption Perceptions Index 2015. President Xi Jinping's high profile anti-corruption campaign seeks to address this problem, but much remains to be done.

- Weak rule of law. Despite repeated attempts to encourage the government to update its laws – for example, the revision to the Chinese company law in 2005 and 2013 respectively – the country's rule of law is still perceived as weak, as exemplified by the World Bank Governance Indicators 2015 placing the country on the 44th percentile in this regard.
- Weak intellectual property rights protection. As indicated by the U.S. embassy in Beijing, despite stronger statutory protection following China's WTO accession, China "continues to be a haven for counterfeiters and pirates." Lax legal protection is not necessarily a disadvantage; for example, several tech giants in China have allegedly imitated their Western counterparts. Tencent's QQ messenger is believed to be an imitation of the Israeli service ICQ and Xiaomi is hailed as the "Apple of the East."
- Adverse effects of enhanced labor protection. After the introduction of the Labor Contract Law in 2007, the resulting rising cost of China's famously cheap labor immediately dented the labor intensive manufacturing sector in Guangdong Province.

Ecosystem Players

Since 2011, the Shenzhen Science and Technology Innovation Commission has played an influential role in strengthening the city's position as a key zone for innovation and technology in China. One notable effort is the "peacock plan," an incentive plan to lure overseas talents to bring their advanced ideas, techniques, and business to Shenzhen. From 2011–2015, 61 "peacock" teams were attracted to the city, benefiting successful hi-tech enterprises such as DJI.

Strategies Employed

Deng Xiaoping's vision of development was that some people and regions should get rich first so that they can provide "demonstration effects" for the rest of the country. This was evidenced by the Chinese government's determination to nurture Shenzhen and some other coastal cities such as Shanghai.

Shenzhen's Special Economic Zone status is one example of the central government's support to develop the city. Furthermore, the National Medium to Long-term Plan for Scientific and Technological Development (2006–2020) showed the central government's determination to strengthen the technology sector. The city's Twelfth Five-Year Economic Plan was accordingly tailored around the national goal to set out the necessary actions.

Results

The establishment of Special Economic Zones was meant to attract global foreign investment, but the reality was investors almost solely came from Hong Kong. Since the late 1970s, many Hong Kong manufacturers have relocated their labor-intensive production processes to China. Owing to the influx of capital and skills from Hong Kong, Shenzhen's economy has been well developed relative to the rest of China, and therefore has been able to attract talent from all over China.

Shenzhen's Nanshang district is home to 8,000 hi-tech companies. The district's per capita GDP reached RMB 308,700 in 2014, overtaking its neighbor Hong Kong, approaching the standard of Singapore, and ranking first among China's counties and districts. The city is the cradle of tech giants such as Tencent, Huawei, and ZTE.

Lessons and Conclusions

- Shenzhen has successfully evolved from a production base of light industrial products to a high value-added technology center, to avoid the adverse impact of the ever-increasing labor and other operational costs in China.
- The city has fully utilized its first mover advantage. It took advantage of the early investments brought into the country by Hong Kong's entrepreneurs as a result of its Special Economic Zone status. This significantly boosted the city's economy and its ability to attract talent.
- Shenzhen may be a lesson to other economies. The central government made a concerted effort to create the success of Shenzhen. It is a classic example of sheer decision and resources that created value. The city started with almost nothing, as opposed to Shanghai, its main rival city, which had been highly developed already before the Second World War.

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THE BUSINESS KIBBUTZ

THE CULTURE THAT LEADS THE JERUSALEM VENTURE ECOSYSTEM

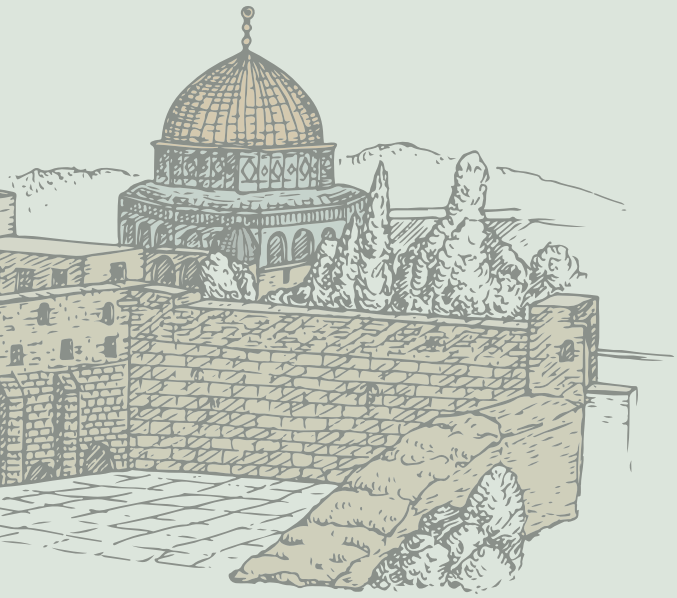
The ancient city today is not just rich in history, but is full of promise and creativity for the future.

— Time Magazine, April 28, 2015

Introduction

The surge of tech and start-up activity in Jerusalem, Israel's capital, in 2012-2016 has been studied by other ecosystems worldwide. Experts point to the unique "business kibbutz" culture in which hugely diverse populations work collaboratively to create a highly connected and supportive tech scene.

We argue that, somewhat hidden by the uniqueness of this ultra-complicated city, the standard ingredients for an innovation ecosystem have existed here for some time. But that, on its own, was not enough. It is what the tech leaders and the city government did with those building blocks that make Jerusalem's experience a highly relevant case study for other cities around the world.



1. Baseline

Jerusalem has always been a city of contradictions – a metropolis of 1.5 million people, the spiritual center of three faiths, the seat of Israel's government and leading academic institutes, and dramatically diverse populations.

One's first association of Jerusalem is not normally as a city with a thriving tech scene. And one's association with a kibbutz – the pre-statehood agricultural collective that grew out of the pioneering, often socialist bent of the early Zionists – is not normally that of a thriving business culture.

JERUSALEM HAS ALWAYS BEEN A CITY OF CONTRADICTIONS

Jerusalem's venture renaissance is particularly striking when you consider its initial baseline. Until 2012, the success story of the "Start-Up Nation," which saw Israel featured as the second largest tech center outside Silicon Valley, seemed to have skipped over the capital city. The city suffered from severe economic stagnation after a wave of violence in the early 2000s. And even when the security situation improved dramatically, Jerusalem continued to suffer from a chronic brain drain as the talented graduates of Jerusalem's leading universities left the city in search of high-paying tech jobs in the Tel Aviv area, where about 60 percent of the country's innovative companies are located.

Though not obvious in the center and in the better neighborhoods of the city, Jerusalem is also one of the poorest cities in the country. Its *haredi* (ultra-Orthodox) sector represents about 20% of the total population and the Israeli Arab sector represents more than 30%. With high unemployment in both communities, they have been portrayed historically as one of the core challenges for the city's economic development.

This is the baseline from which today's vibrant urban venture ecosystem sprang up.

2. Turnaround

Considering the starting point, the ramp-up of the Jerusalem tech scene in the past four years is impressive, and unlike other leading start-up cities around the world cannot be seen simply as a natural progression of the city's development.

Since 2012, the city has seen a marked increase in new start-ups being founded, high-impact accelerators launched, and VC funds established. More than 300 start-ups have been established in Jerusalem in the last three years, doubling the number of start-ups in the city; tech investments have increased almost fourfold – from US$70 million in 2012 to US$272 million in 2015 – and there has been an unprecedented surge in tech events all over the city, from only a handful a year to more than 350 in 2015.

This trend has also been noticed by the media. In 2015, Jerusalem was listed as #1 in a *Time Magazine* ranking of the five emerging tech hubs around the world. Jerusalem was also included in the Startup Compass "2015 Global Startup Ecosystem Ranking" as one the world's top 40 start-up cities, and among the top 20 in Europe.

3. Mapping the Ecosystem

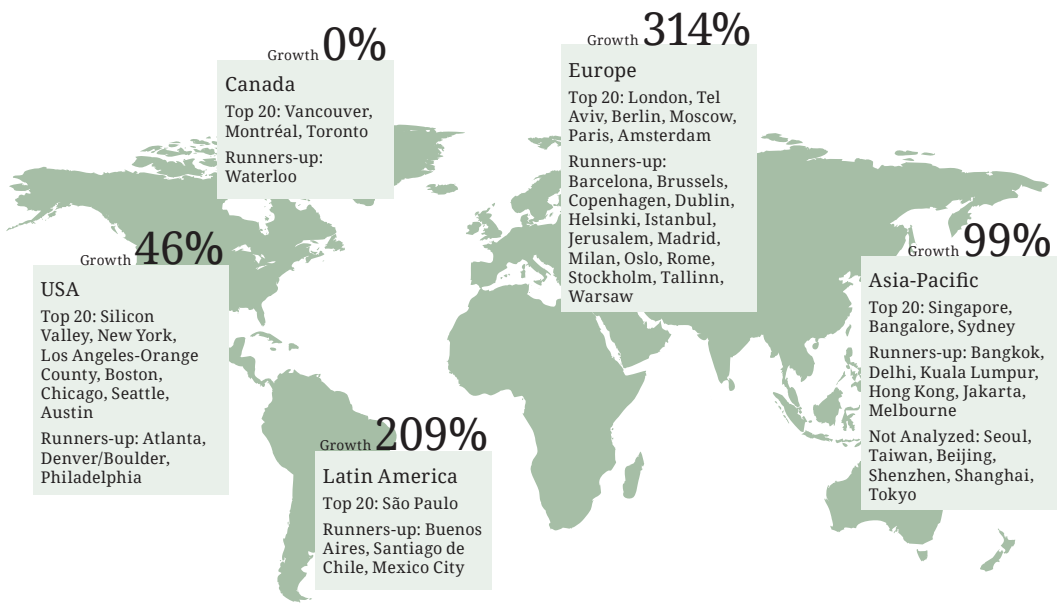
To really understand what happened, and what the unique contributing factors were, we have to look at the basic ingredients that existed in Jerusalem before all this took place.

To a visitor at that time, it might have seemed that most of the factors were actually already there. State government tax incentives for the tech sector had already existed for many years; Jerusalem had **the Hebrew University,** ranked 23rd in the worldwide list of academic institutions for the year 2015 (CWUR), and 67th according to Shanghai Ranking, and additional top notch academic institutes such as **Bezalel,** Israel's top art and design school, **Jerusalem College of Technology (JCT),** and **Azrieli College of Engineering (JCE)**, producing hundreds of talented engineers, designers, and software developers every year.

Yissum, The Hebrew University's TTO (Tech Transfer Office), was one of the earliest TTOs in the world, and became a pioneering model for other TTOs in universities around the world. Jerusalem had core facilities of global companies: **Teva Pharmaceuticals,** Israel's

Figure 1: Exit growth

Source: Start-Up Genome Report 2015



largest company, **IBM**, **Intel**, which opened its first semiconductor plant outside the U.S. in Jerusalem in 1985, and more.

There was no shortage of service providers which are crucial for the success of start-ups, including lawyers and patent attorneys, accountants, designers (50% of the design talent in Israel is trained in Jerusalem), and software development houses. The city also had a few tech investors, most notably JVP (Jerusalem Venture Partners), one of Israel's largest and most successful VCs, three government-backed technological incubators, and more.

THE TURNAROUND CAN FIRST BE SEEN IN 2012 WHEN THE CITY HAD ITS FIRST MAJOR "EXIT"

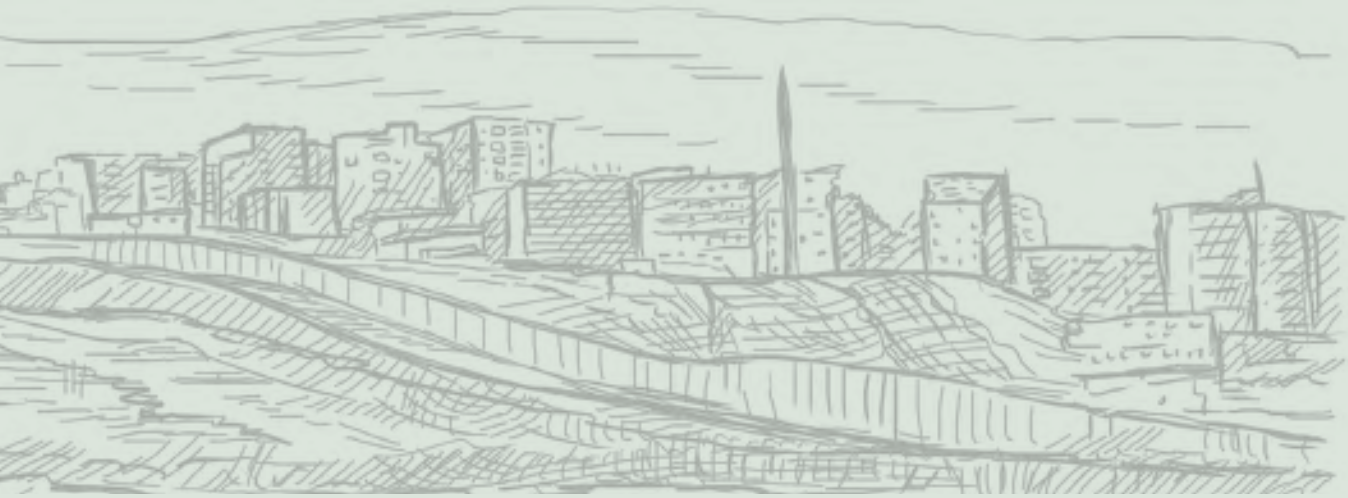
At a glance, there was a lot in Jerusalem already, but obviously, in order to ramp up, integral building blocks were still missing.

The turnaround can first be seen in 2012 when the city had its first major "exit." **NDS**, a large Jerusalem-based video and security technology company which was created by four JCT graduates, was acquired by another company which led to its purchase by the tech giant **Cisco** for US$5 billion. This was one of Israel's largest mergers and acquisitions (M&A) deals ever, and based on that acquisition, Cisco opened its R&D center in the city, employing more than 1,000 Jerusalemites as of 2016.

At about the same time, **Mobileye**, with its groundbreaking computer vision technology for automobiles, was co-founded by Amnon Shashua, a professor of computer science from the Hebrew University. Mobileye began to grow fast and went public in 2014, becoming the largest IPO in Israel's history. In 2016, the company was valued at more than US$9 billion and had close to 800 engineers in its headquarters in Har Hotzvim, the hi-tech industrial park in north-west Jerusalem.

When we say "scarce" in terms of VCs located here, we mean just that. Jerusalem Venture Partners has been around since the nineties, and is in fact a giant in its field, ranked annually among the best performing VCs in the world with US$1.3 billion assets under management since its inception. But apart from JVP and two smaller VC funds, Israel Seed Partners and Jerusalem Global Ventures (JGV), there were very few venture funding opportunities for these early-stage entrepreneurs, and seed capital was in short supply.

In 2012, OurCrowd, the first crowdfunded VC in Israel, came on the scene and was soon joined by two government-funded incubators. Later in 2012, and throughout 2013, start-up accelerators started to sprout up, most of which operate on a non-profit model. They became successful and continue to thrive. **Siftech**, the city's first accelerator, was started by Jerusalem-based students who wanted an early stage support vehicle for their young start-ups, and quickly gathered support from the municipality, VCs, and some philanthropists.



Following Siftech, the **AtoBe accelerator** was founded by a lecturer at the Azrieli School of Engineering, allowing its students, and other select Jerusalem companies, to have dedicated work space, along with mentoring and access to the college's advanced labs. In both cases, the government-sponsored Jerusalem Development Authority (JDA) offered financial support for these initiatives, thereby allowing them to thrive on a non-profit basis without the need to charge the entrepreneurs or to take any equity.

During 2014, two more accelerators were opened for specific sectors in the city: Hani Alami, an East Jerusalem businessman, created **JEST** for Arab East Jerusalem entrepreneurs, and Ben Wiener, a partner in Jumpspeed, a Jerusalem-focused venture fund, created **Yazam Balev**, a dedicated start-up program for haredi (ultra-Orthodox) entrepreneurs. The opening of these two accelerators reflected the commitment of the community to tap into and develop these two populations as potential sources of badly needed human capital.

WHAT MADE THE SYSTEM TAKE OFF TURNED OUT TO BE COMMUNITY AND LOCAL PRIDE

The very communities that had been seen for decades as being at the root of Jerusalem's challenges began to be seen as a source of solutions. This model may be applicable to other cities with minority communities to develop their innovation potential, thereby addressing human capital shortages.

Perhaps the crowning achievement came in 2016 when MassChallenge, dubbed the world's largest start-up accelerator, chose Jerusalem for its Israel location, and the third branch in the world after its headquarters in Boston, and its European center in London. MassChallenge's call for applicants for the first cohort of 48 in Jerusalem saw 550 applications from more than 35 countries. The fact that an internationally renowned tech accelerator chose Jerusalem as its headquarters helped put Jerusalem on the map of innovation, both nationally and globally.

4. Creating a Community

If the main building blocks were mostly in place by 2012, what was added that made the system take off turned out to be community and local pride. At the time, some companies had been hiding the fact that they were based in Jerusalem, as the association with Jerusalem was more one of conflict and religion than of tech and innovation.

The turning point was when a small group of young, ambitious, and visionary entrepreneurs saw the city's potential, saw what was glaringly missing, and didn't give up.

"It was when entrepreneurs, academics, funders, creatives, and government started to interact, started to identify critical connect-points, that this thing lit up," according to Elie Wurtman, the founder of PICO Ventures, a venture fund and one of the first co-working spaces for start-ups in town which opened in 2012.

The integrated tech community on which Jerusalem prides itself today was the result of numerous bottom-up initiatives as a highly energized group of tech leaders started to coalesce. These leaders formed an NGO that would later become the "tech evangelist network" for promoting Jerusalem's ecosystem.

MadeinJLM was founded in 2011 by two young but savvy entrepreneurs, Roy Munin and Uriel Shuraki, and our co-author, Hanan Brand. Their vision was for Jerusalem to become one of the top 20 start-up ecosystems in the world by 2020, a mission that seemed quixotic when the organization was founded. What they didn't realize when they assembled this all-volunteer network was that the seemingly mundane step of bringing together entrepreneurs would have such an impact so quickly.

MadeinJLM and others in the city concluded that what was missing was **branding and marketing** of the city's leading companies and of the ecosystem as a whole. The locally famous MadeinJLM logo, and the slogan "Jerusalem – 3000 years of innovation," captured both the historic significance of the city and its thriving ecosystem. This communal effort served to amplify Jerusalem's success story.

"We were determined to create a buzz that 'something interesting is happening in Jerusalem,'" reminisced Munin about the early days of the organization. This is a model applicable to many cities around the globe.

The entrepreneurs approached Jerusalem Mayor Nir Barkat to engage him in taking all this activity to the next level. Their appeal did not fall on deaf ears as Barkat himself was a successful hi-tech entrepreneur before entering public service. As co-founder of BRM and one of the first investors in the cyber security company CheckPoint, he is of the tech world, and brought that DNA with him to manage this complex city.

The young tech leaders worked hand-in-hand with the mayor and his economic team to re-shape the nature of the broad tax incentives and cash grants the city was offering for start-ups setting up and growing there.

One of the driving forces behind the changes was the JDA, a statutory corporation legally established in 1988 and tasked with promoting Jerusalem's economy. The JDA launched a hi-tech and entrepreneurship program, Jnext. Headed by co-author Helen Wexler, the goal of this program was to create a supportive environment for entrepreneurs in the city. The JDA assists companies in the city through financial incentives, infrastructure development, sponsoring tech events, and connecting companies with business delegations.

JDA's heads, Eyal Haimovsky and Itzik Ozer, concluded that a greater level of city government activism was required.

"Essentially, we had all of the ingredients for a tech powerhouse here all along, but mixing them together, through the combination of accelerators, community NGOs, and government initiatives, has promoted the success of the city as an emerging tech hub," says Ozer.

Another initiative by the JDA was created to serve as an entry portal into the city's flourishing biotech sector. Bio Jerusalem, headed by Shai Melcer, is today the epicenter of the more than 150 start-ups and innovative companies that make Jerusalem the largest biotech center in Israel. Melcer, like other advocates of the city's recent successes, points to the long-term impact of the research environment and the fact that the different players have learned how to collaborate.

For decades Hadassah Medical Center and The Hebrew University have worked together to create a powerhouse of biomedical research and advancements. Hadassah's Ein Kerem campus is home to world-class research, and the Jerusalem Bio-Park houses 12,000 square meters (129,167 square feet) of start-ups. These municipal programs have made Jerusalem the only city in Israel with centralized programs to support the local biotech ecosystem, while also providing the institutional connectivity that complements the grass roots initiatives.

But Melcer also notes the city's unique set of strengths and weaknesses: "It is, at the end of the day, the largest city in Israel, with the largest diversity of population, with the largest diversity of needs."

"...ENTREPRENEURS WANT TO LIVE 'WHERE THE ACTION IS'"

Building a community was critical. But no ecosystem can flourish without accurate and actionable data. In fact, it is almost impossible. Without gathering all of the data on the relevant players in the city – R&D centers, investors, office spaces, accelerators, start-ups, and service providers – all critical factors for the success of early-stage technology companies, it is almost impossible to understand what is really going on, to measure progress, and to assess what is still missing and what needs to be done.

More importantly, a database is essential in order to create connectivity between the members of the community, which is why one of MadeinJLM's first goals was to map the city's whole tech ecosystem. Collecting these data was a community-wide effort. It also allowed the creation of a popular crowd-sourced "jobs board" showing the most recent openings in scores of companies, and helping entrepreneurs in finding co-founders, mentors, partners, and even investors in the city itself.

More recently, a newly founded non-profit, Start-Up Nation Central, led in Jerusalem by our co-author Wendy Singer, has appeared on the scene. This organization taps into the globally strong brand name (inspired by the book) *Start-Up Nation*, and serves as a "global arm" for the Jerusalem ecosystem. In addition to attracting even more corporate and government traffic to the city, Start-Up Nation Central has launched a platform that maps out the entire Israeli ecosystem. Every innovative company and investor in Jerusalem is given global exposure through this highly trafficked platform.

5. The "Business Kibbutz"

Networking events and meetups have been an important tool for creating community, branding, and building momentum. According to a 2014 World Bank report on urban tech innovation, "...entrepreneurs want to live 'where the action is'... they look for conventional startup support, such as mentor networks or role models, but also for nightlife, meetups, social activities, and other potential for 'collisions' – a combination best provided by cities."

The surge in such events in Jerusalem (reaching some 350 events in 2015) was a strong indication that such a community was in formation.

A centralized event listing was another missing piece. Entrepreneurs needed to have a one-stop-shop where they could see all of the tech and networking events happening on a given day. The MadeinJLM website, launched in 2013, filled this role, helping groups and community leaders to connect to each other and reach a larger audience. The use of social media, mainly Facebook, but also Meetup, Twitter, Instagram, and blog platform Medium, helped to grow the circles and expand the community.

The notion of a "kibbutz" culture permeating Jerusalem's business scene comes up often. If one thinks of the idealistic pioneers who came to the land of Israel early in the 20th century, their goal wasn't just to settle the land, but to build a whole new kind of collective and idealistic society. In a traditional kibbutz, people live and work together on a non-competitive basis in order to build a better future.

We will hardly argue that there is no competition in the business and venture worlds of Jerusalem. But the shared sense of purpose and commitment to the success of the many is evident in many corners of this unique ecosystem.

As Stav Erez, one of the early "pioneers" of Jerusalem's tech sector, likes to explain, in most other cities, if an entrepreneur shares a big new idea, his/her colleagues will say, "Great idea, good luck," and wish them well. If a Jerusalem entrepreneur shares a big, new idea with fellow Jerusalemites, the more likely response is, "Great idea, what can I do to help?"

An illustration of how connecting the dots can have an impact was when representatives of one of world's largest chip manufacturers (Texas Instruments) and a leading European telecom company (Deutsche Telecom) met with Uri Adoni, a partner at JVP, Jerusalem's largest VC, to discuss potential collaboration on promoting new IoT (Internet of Things) start-ups.

THE NOTION OF A "KIBBUTZ" CULTURE PERMEATING JERUSALEM'S BUSINESS SCENE COMES UP OFTEN

Adoni had an idea, but instead of keeping it to himself, he called Oded Barel, managing director of the Siftech accelerator located within the JVP compound, and Ronel Mor, head of interactive media studies at the Visual Com department of Bezalel. Together, they devised a unique concept: an IoT and design course for students that would combine the design strengths of the school with the expertise of Texas Instruments on IoT sensors. In addition, Deutsche Telecom would help build the software components and the JDA would help with funding the course.

After pulling in key people to hammer out a proposal and curriculum, a course was born in just a few weeks. No matter that all this happened in July (2013) and the academic year was due to start a few months later, and such courses are normally proposed and built at least a year in advance. With classic Israeli disrespect for hierarchy and willingness to improvise, the course was offered and was a tremendous success.

What is noteworthy about this story, besides the Israeliness of the players, is that otherwise unconnected players came together to pull this off. The joining of key players, and their willingness to pool resources, were classic examples of the DNA of the Jerusalem ecosystem and its "business kibbutz" culture.

Conclusion

Jerusalem's Secret Sauce On the heels of the city's turn-around, there have been many internal debates regarding what is really "the secret sauce" of Jerusalem's tech ecosystem. While the rest of the world, and much of the rest of Israel for that matter, were viewing Jerusalem as a city of ancient stones and ancient problems, a unique, vibrant tech hub was born.

One aspect of the Jerusalem phenomenon that many point to is this inexplicable ability of Jerusalem tech types to both compete with one another and to simultaneously be supportive of one another. The tech leaders even called for one day each year ("Firgun Day," from the informal Hebrew term for genuine, unselfish delight in the accomplishment of another) when each person would find something to celebrate about his peer's (or competitor's) success, which went viral on social media channels.

Jerusalemite entrepreneurs understand that the full pie is larger than the sum of its parts, perhaps harking back to the kibbutz DNA, which is cooperative at its core. There are competing venture capital partners, start-ups, and even service providers all working together, all with their eyes on the larger pie.

Evidence of this is the very active WhatsApp group, comprised of some 150 leaders in the start-up community, exchanging information daily about business delegations, passing along investment tips, and sharing notes about upcoming events and important deals. Significantly, this cooperation spans the gaps between the city's diverse populations, including haredi Jews and Arabs.

And the story continues. In September 2016, Mayor Barkat hosted a cornerstone laying ceremony to launch his visionary plan for a massive "business quarter" at the entrance to Jerusalem. This new quarter will be adjacent to the terminal of the new rapid train, which will shrink travel time between Israel's main business center in Tel Aviv and Jerusalem to only 28 minutes.

Barkat likes to point out that every model that is tried and succeeds in Jerusalem, the toughest of cities, can be a trailblazer for any other city in the world. In a land of miracles, perhaps Jerusalem, its capital, is an innovation miracle.

FURTHER RESOURCES

The Ancient City of Jerusalem Is Seeing Rebirth as a Tech Hub https://www.entrepreneur.com/article/246468

Tel Aviv, Jerusalem among world's top tech cities http://www.timesofisrael.com/tel-aviv-jerusalem-among-worlds-top-tech-cities/

Hanan Brand: Jerusalem's venture success bodes well for other Israeli cities. http://www.geektime.com/2015/12/13/hanan-brand-jerusalems-venture-success-bodes-well-for-other-israeli-cities/

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Helen Wexler
Head of Jnext, Jerusalem Development Authority

Wendy Singer
Executive Director, Start-up Nation Central

Inhabitants: 801,000 (2012); 865,000 (2016). Metropolitan area: 1.5 million (2016)

The Geographical Context

The capital of Israel, Jerusalem, is best known as a religious and historic center, and one of the holiest cities for three religions. It is also a center of Israeli government and of academia. The financial and business center of the country is located 60 km away in the coastal city of Tel Aviv.

Relationship with Government

Jerusalem enjoys many government incentives for business creation. Additionally, the Municipality of Jerusalem is intent on encouraging technology companies to operate in the city. The national and municipal governments actively support many of the accelerators, hubs, and technology education programs.

Companies in the city can benefit from a 9 percent corporate tax rate, as compared to a 25% tax rate in Israel's center.

The Jerusalem Development Authority provides employment grants of up to US$120,000 for young tech companies. Most of the city's accelerators have received varying degrees of financial support.

Anchor Institutions

- The Hebrew University of Jerusalem, the city's major academic institution, is both a hotbed of R&D innovation and a source of skilled graduates. The university ranked 23rd in the list of academic institutions for the year 2015 (CWUR), and its Tech Transfer Office, Yissum, is one of the first and highest ranked TTOs in the world.
- Bezalel Academy of Arts and Design, Israel's top art and design school, produces a large percentage of Israel's design talent.
- Jerusalem College of Technology (JCT) and Azrieli College of Engineering (JCE), both sources of engineering and software development professionals.
- The Jerusalem Development Authority (JDA) was established in 1988 as a partnership between the government, the Municipality and the Ministry for Jerusalem and Diaspora Affairs.
- Jerusalem Venture Partners (JVP) is one of Israel's largest VC funds, with US$1.3 billion under management since its inception. The fund is ranked in the top-30 VCs in the world in terms of returns to investors.
- Ourcrowd, headquartered in Jerusalem, is the largest equity crowdfunding platform in the world, with 12,000 accredited investors who have invested US$300 million in more than 100 companies.

Venture Statistics

- More than 400 start-up companies, 200+ of which were founded in 2014 and 2015 alone.
- New start-ups opened in the city: 40 in 2012, 50 in 2013, 100 in 2014, 110 in 2015.
- Tech investments in Jerusalem: increased fourfold, from US$70 million in 2012 to US$272 million in 2015.
- Accelerators and start-up hubs: from 0 in 2012 to 14 in 2015.
- 15 active VC funds (including two government-backed tech incubators), tens of angel investors.

Strengths

- A strong community spirit, drawing diverse populations of entrepreneurs into a cohesive force committed to the city's advancement.
- A mayor – Nir Barkat – with a strong

entrepreneurial and VC background (BRM, CheckPoint) and a commitment to developing the local venture ecosystem.

- Presence of large hi-tech companies – Intel, Cisco, Teva, Mobileye, Johnson & Johnson, Medtronic, Merck, Kaspersky, IBM, and more – that have a strong impact on the city's tech scene.
- Strong sense of community and willingness to collaborate between competing organizations.

Weaknesses

- Shortage of highly experienced talent, mainly owing to departure of young professionals and university graduates from the city following the dot com bust and the second intifada commencing in 2000.
- Salaries generally 20% lower than in central Israel.
- Under-representation of the ultra-Orthodox (Haredi) and Israeli Arab communities in hi-tech.
- Start-up friendly office space in short supply.
- Lack of global branding of Jerusalem's tech sector and venture scene.

Ecosystem Players

- MadeinJLM, a nonprofit that connects and provides resources for the tech and start-up ecosystem in Jerusalem.
- Start-Up Nation Central (SNC), an Israel-based non-profit that connects corporates and governments from around the world with Israeli innovation, to solve their most pressing challenges. SNC has also launched multiple activities to help strengthen and grow Jerusalem's tech sector.
- MassChallenge, the world's largest start-up accelerator, chose Jerusalem as its Israeli location, and hosted 48 companies in its first cohort in 2016.
- Siftech, a non-profit accelerator that was established by The Hebrew University student union. Today it hosts early-stage entrepreneurs. Recently established a student-led venture fund.
- AtoBe – Israel's leading engineering focused accelerator, located in the Azrieli College of Engineering (JCE).
- HUStart – The Hebrew University's entrepreneurship program which includes a pre-venture accelerator.

Strategies Employed

- Significant branding of Jerusalem's ecosystem and venture scene within Israel.
- Launching numerous meetups and events that pull together the city's entrepreneurs and tech professionals .
- Establishing a communication forum for the ecosystem leaders.
- Restructuring grant conditions to be more flexible, entrepreneur-friendly and less bureaucratic.

Results

- The rapid rise of Jerusalem's start-up scene from 2012 is extraordinary on a global scale: in 2015, Jerusalem was listed as #1 in a *Time Magazine* ranking of emerging tech hubs in the world.
- Jerusalem was also included in the Startup Compass "2015 Global Startup Ecosystem Ranking," as one the world's top 40 start-up cities, and among the top 20 in Europe.
- The venture capital raised annually by Jerusalem companies quadrupled between 2012 and 2016.

Lessons and Conclusions

- The combination of bottom-up, grassroots activism by the entrepreneurial community with top-down activity from municipal and state government is a critical one. The grassroots movement "leads the way" by bringing its know-how as to what the ecosystem needs most.
- The nurturing of a culture of local patriotism in the venture community has been instrumental in making Jerusalem an attractive start-up location.
- Emphasis on the quality (over quantity) of the city's start-ups has resulted in a perception shift by venture capitalists in recognizing Jerusalem as a viable market.
- Local and national government can create structures that incentivize collaboration.
- The more connected the ecosystem is, the more it has a chance to succeed. In Jerusalem's case, it wasn't until NGOs started to connect the dots that the ecosystem really took off.

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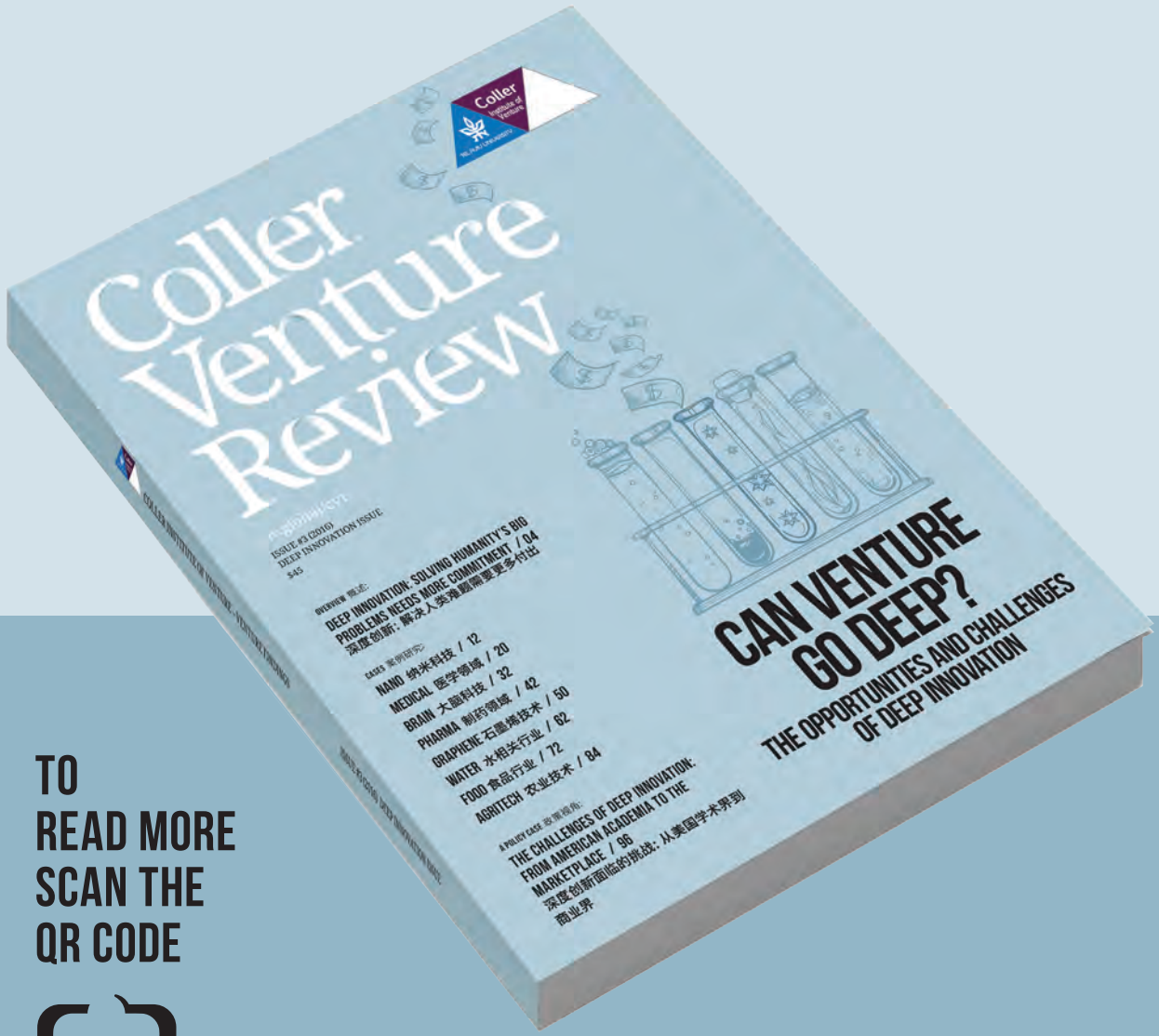

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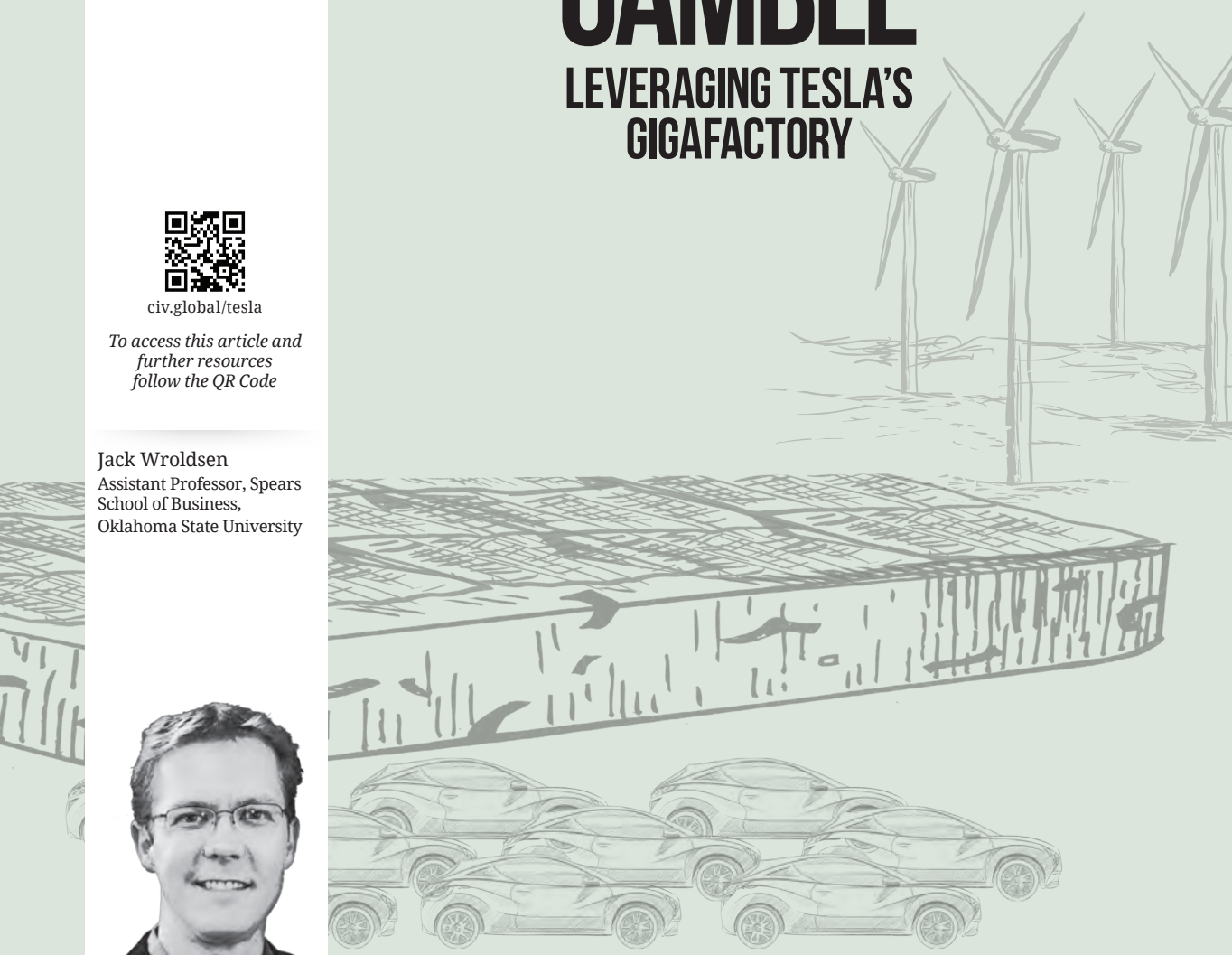


Introduction

Reno, Nevada, whose moniker is "The Biggest Little City in the World," is now home to what will soon be the largest building in the world, by footprint: Tesla's new Gigafactory, which produces lithium-ion batteries for Tesla's cutting-edge electric cars and home energy-storage systems. The Gigafactory, which should reach full capacity by 2018, is a strangely perfect match for a city that anxiously aspires to bigness, yet humbly acknowledges its smallness.

Tesla's enormous, robot-filled factory is housed in the largest industrial park in the world, which is also home to what should soon be the largest data center in the world. Despite Reno's claims to bigness, though, it is still just a small metropolitan area of approximately 500,000 inhabitants that is unlikely to appear on anyone's list of most recognizable cities. Appropriately then, Reno's economic and entrepreneurial development is a tale of contrasts – its achievements often overshadowed, Reno is nonetheless a city coming into its own.

Within Reno's contrasts lie the generalizable lessons for other cities grappling with urban revitalization and technological transformation: be true to yourself; seek growth that complements your natural place in the world; capitalize on inherent competitive advantages to attract momentum and rebrand a tarnished reputation. And with those priorities in place, then boldly shoot for the stars, or in Reno's case, woo the man who would colonize Mars.

Five key factors influence the development of Reno's emerging entrepreneurial ecosystem. First, Reno has undertaken a decades-long project to diversify its economy. Second, Nevada has established multiple policies to affirm a business-friendly climate. Third, Reno has exploited its geographical advantages to develop into a regional hub for logistics, manufacturing, and storage. Fourth, Reno aggressively pursued and won the Gigafactory, which serves not only to enhance Reno's industrial identity but especially to recast the city's image for a new generation of tech-savvy professionals. Finally, in keeping with Reno's new-found identity, the city has sought to revitalize its downtown and cultivate an entrepreneurial culture among urban start-ups and the University of Nevada.

1. Hitting Bottom

To appreciate Reno's resurgence, we must remember its struggles. The city's economic history has been turbulent, marked by extreme boom and bust cycles. Reno's silver boom of the late 1850s sparked enthusiasm and small fortunes, but not sustainability. Even in good times, the Nevada silver (and gold) rush was overshadowed by the more famous California gold rush just over the Sierra Nevada mountains. Next, in the 1930s, gambling (and easy divorces) put Reno on the map for all the wrong reasons. The city even boasted the largest casino in the world up to the 1950s, before the glamour of Las Vegas overshadowed Reno again, leaving it reeling as a backwater gaming destination.

Then, in the 1990s and early 2000s a housing boom energized Reno, fueled by the city's fortuitous location in the sun-belt with a pleasant, dry climate, alongside the majestic Sierras, and less than an hour from the world-renowned Lake Tahoe. But the corresponding housing crash of 2007 was brutal. As tourism and gambling money dried up during the Great Recession of 2007-2009, Reno's economy imploded. Unemployment reached almost 15 percent (up from less than 5%). Foreclosures dominated the landscape, and residential housing prices dropped nearly 60% from their 2006 peaks.

In 2011, Reno was ninth on a list of the "saddest cities," and in 2012, Reno placed second in a ranking of U.S. cities "most nearly destroyed by the recession" (first place went to Carson City, just 30 miles south of Reno). Moody's Ratings called Nevada's recession "the worst of any state."

Reno's dismal showing in such rankings is reflected in the national consciousness: "It's a dump," as comedian Amy Schumer put it when asked why she named Reno as the worst imaginable place to spend a weekend. Seth Meyers of *Saturday Night Live* also piled on, joking that "Reno, Nevada, finally killed itself." Among other slights in popular culture, the city was immortalized in the *Reno 911!* comedy series that portrayed Reno as a rundown, culturally debased locale.

2. Diversification

Now, however, Reno is on the upswing again, and this time seems different from past rebounds because Reno has embarked on a path of diversification designed to help the city weather future storms with more stability. Casinos and mining continue to be mainstays of the Reno economy, but efforts to broaden economic activities are progressing. The leadership mandate starts at the top: in 2011, the Nevada legislature elevated the importance of economic development activities by reorganizing them into the Governor's Office of Economic Development (GOED), which is led by a cabinet-level executive director empowered and funded to implement a state-wide strategy for diversifying Nevada's economy.

Within a government bureaucracy, the symbolic and practical value of increasing the authority and visibility of economic development initiatives cannot be understated, because they infuse the initiatives with legitimacy and instill a culture of cooperation that welcomes economic development at the highest levels of organizational and political power.

The GOED is known as "Diversify Nevada," and its activities target specific industries that are a natural fit for the state. Namely, top priorities include hi-tech manufacturing, logistics, warehousing, information technology, and aerospace, among others. The targeted industries build upon small but existing advantages that were rigorously analyzed through one of Diversify Nevada's first acts: an exhaustive third-party study titled "Unify, Regionalize, Diversify," which serves as a roadmap to the economic development activities likely to succeed in Nevada, given the state's particular strengths and weaknesses.

Where countless others have attempted to mimic Silicon Valley's start-up and venture capital ecosystem, Reno has charted its own unique path, one that supports the software and Internet innovation hotbed across the Sierras, but does not pretend to rival it. Instead, embracing its complementary position, Reno seeks to capitalize on its own competitive advantages to create its own economic clusters in support services and emerging industrial technologies. It is a strategy full of humility and realism, yet also brimming with potential and aspiration – the right combination of contrasts for the biggest little city in the world.

3. Business Climate

The Diversify Nevada vision is enhanced in Reno through an influential public/private partnership known as the Economic Development Agency of Western Nevada (EDAWN), which helps smooth the path for companies to do business in Reno. In Tesla's case, the path was so smooth that state officials first greeted Tesla executives with an already-issued permit to begin digging. Communicating a business-friendly attitude through actions, not just words, pays huge dividends: when Tesla's CEO, Elon Musk, ultimately announced that the Gigafactory would be built outside Reno, he said Nevada is "a real get-things-done state." No marketing campaign touting a business-friendly climate could ever speak more forcefully to other technology companies than an endorsement from a ground-breaking Silicon Valley innovator like Musk.

Fostering a business-friendly climate runs deep in Nevada; for example, the state prides itself on reducing or eliminating taxes. Not only is there no state income tax for individuals or corporations, there are also no inventory, franchise, inheritance, or estate taxes. Furthermore, Nevada offers property tax exemptions for numerous items (such as inventory held for distribution and materials used in manufacturing), as well as incentives and tax abatements for environmentally conscious construction, alternative energy businesses, and large-scale industrial projects. The state was even the first in the nation to authorize experimental self-driving cars.

Also, Nevada's corporate laws are management-friendly, and it is a "right-to-work" state (which supports Reno's burgeoning manufacturing sector by reducing the influence of labor unions). The state thus goes to great lengths to promote a business-friendly environment, which has been instrumental in helping Reno establish an emerging cluster of specialized industrial activity.

4. Regional Hub

Reno's diversifying economy is especially noteworthy in e-commerce distribution facilities, data centers, alternative energy, and manufacturing. Reno has succeeded in these areas not only due to government policies that enhance the business environment but also because of Reno's large amount of inexpensive land and the city's ideal location along western transport routes.

From mastodons to Native Americans, to western settlers, to the Transcontinental Railroad, and even to present-day air travel corridors, Reno has long been a heavily traversed gateway between the Pacific coast and the western United States. Not only does Reno offer easy access to the San Francisco Bay Area, but Reno is also within one-day's drive from all other major West Coast markets, such as Los Angeles and Seattle, and within a one- or two-day drive of all other western states, such as Colorado and Arizona.

But convenient access to markets is only part of the story. The other is the presence of a gargantuan industrial park known as the Tahoe-Reno Industrial Center (TRIC), which is said to be the largest in the world. Covering 107,000 acres, TRIC boasts 30,000 acres of developable land that is pre-approved for industrial and manufacturing uses. Five on-site power plants deliver electricity to TRIC businesses, and all TRIC sites have high-pressure gas, fiber optics, water, and sewer services. And TRIC is as business-friendly as can be: the county community development director says he's "the first one to tell you I don't like government. I don't like taxes. I don't like bureaucracy. We run as a business."

Initial grading permits are granted on the same day they're requested and building permits take only 30 days, which has helped generate momentum that the director describes as "almost unimaginable" and "unprecedented in my 40-year" career in development.

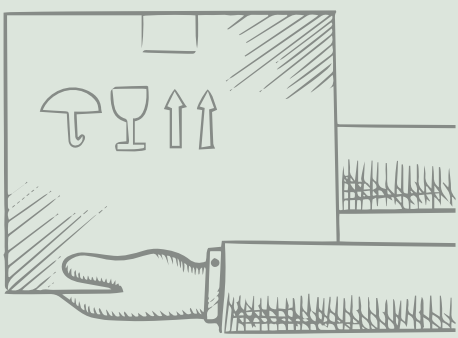
TRIC houses all kinds of industrial facilities. There are manufacturing plants for everything from diapers to machine guns, and foam packaging to petro-chemical refining. Distribution warehouses abound, for flowers, pet food, construction materials, and much more. Amazon has an enormous fulfillment center, as do Wal-Mart, Barnes & Noble, eBay, Zulily, and PetSmart. The American Red Cross, too, chose TRIC to house its West Coast disaster relief supplies.

Then there are the data centers. With an investment of US$1 billion in its TRIC location, Switch is building the largest colocation center in the world. Fueled by solar energy, the Reno location will complete Switch's fiber-optic circle known as the "SuperLoop" which connects San Francisco and Los Angeles to Switch's data centers in Reno and Las Vegas. Switch's anchor tenant at TRIC will be eBay, and eBay is also building its own data center next door, a separate US$230 million investment for which Nevada approved US$30 million in tax incentives.

THE STATE WAS THE FIRST IN THE NATION TO AUTHORIZE EXPERIMENTAL SELF-DRIVING CARS

But Apple was the first mover that marked the beginning of Reno's transformation into a data center hub. In 2012, Nevada approved US$89 million in tax incentives over 10 years for Apple to inaugurate a data center campus at the Reno Technology Park, powered by Apple's nearby solar farm. The initial project quickly reached capacity, so in 2015 Apple decided to begin work on doubling its data center presence in Reno. Following Apple's lead, RackSpace is seeking Nevada tax incentives to build a US$422 million data center next to Apple's campus.

The list goes on, but the conclusion is unmistakable: Reno is establishing a native industrial cluster due to a combination of its



natural advantages and its pro-development policies. Content not to imitate glitzier software and venture capital hubs, Reno is mindfully building a core of technology-oriented support businesses in relatively unexciting areas such as e-commerce fulfillment centers, warehouses, data centers, and manufacturing facilities. These activities pale in comparison with the current technological pinnacles of social media, mobile, or virtual reality, but well-designed development policies must complement a city's true identity and natural advantages, not strive to emulate others. Such policies create momentum that is self-reinforcing. They plant the seeds for organic growth and positive spillover effects. In Reno's case, the groundwork to becoming a hi-tech manufacturing cluster was laid well in advance of the largest prize to date: Tesla's Gigafactory.

5. The Tesla Effect

The US$5 billion Gigafactory, for all its fanfare, is not a singular economic development for Reno; it is the culmination of a decades-long strategic transformation from downtrodden gambling town into emerging technology center. The Gigafactory is expected to create up to 6,500 direct jobs over five years, and during the same period Reno expects more than 50,000 additional jobs from organic growth, company relocations, and ancillary services for the Gigafactory. The Gigafactory itself is massive: its footprint alone will be 10 million square feet—more than 100 football fields – and is it also two to four floors high. It is situated on a 1,000 acre parcel, and Tesla recently purchased nearly 2,000 additional acres in TRIC to accommodate even more future growth.

One of the key raw materials for Tesla's electric battery systems is lithium. Conveniently, the only operating lithium mine in the U.S. is in the Nevada desert, and worldwide, Nevada's lithium resources are second only to Chile's. Even Nevada's mining heritage is thus connected to its technological future, providing yet another example of how the best economic development policies stem from a city's natural advantages. The Gigafactory includes integrated production lines through which Panasonic will make and deliver battery cells to Tesla's manufacturing line, all under one roof.

An engineering marvel that Tesla's Elon Musk likens in importance to Henry Ford's assembly-line innovation, the Gigafactory is central to Tesla's ability to meet demand for its first mass-market automobile, the Model 3. Musk considers the Gigafactory itself "to be a product," deserving of even "more attention from creative problem-solving engineers than the product that it makes," because of mass-production efficiencies.

THE GIGAFACTORY PERFECTLY CAPTURES RENO'S EVOLUTION

The Gigafactory perfectly captures Reno's evolution: a solar-powered manufacturing facility and data center that combines cutting-edge robotics with old-fashioned mining to produce energy-saving batteries for innovative electric cars and home storage systems. Despite all its hi-tech components, though, the Gigafactory is still just a supply factory. Tesla cars are designed elsewhere (in Silicon Valley, of course), and Tesla's executive headquarters aren't leaving the Bay Area for Reno anytime soon. But the Gigafactory puts Reno on the map at the highest levels of technological innovation. The Gigafactory is not just a factory; it is the emblem of Reno's new-found legitimacy as an industrial technology leader.

The Gigafactory has "changed the trajectory of Nevada forever," proclaimed the state governor, with Tesla CEO Musk beaming alongside him. This is rebranding. This is impactful marketing. Don't just *tell* the world who you are; *show* everyone who you've become. That Musk would even set foot in Reno, much less make a multi-billion dollar investment into a cornerstone of his electric-powered vision, would have seemed laughable only a few years ago. But Musk's endorsement of Reno speaks volumes: the man who envisions settling another planet (Mars), who founded a rocket ship company (SpaceX), who open-sourced a revolutionary idea for ground transportation (the hyperloop), and who is attempting to disrupt both the automobile industry and the world's reliance on fossil fuels (Tesla and SolarCity), is now forever linked to Reno.

Musk describes the Gigafactory as "the most exciting factory in the world. If you can work

on any factory in the world, you'd want to work on this factory." And with that, the biggest little city in the world has officially launched a new era with a new claim to fame in industrial technology.

But image makeovers are not cheap, especially for cities in such dire straits as Reno was in a few years ago. To lure Tesla, Nevada approved a US$1.3 billion package of tax breaks and incentives over 20 years. Defenders of the deal point to the anticipated US$10 billion in direct investment and US$100 billion in economic activity, not to mention Tesla's US$37.5 million contribution to Nevada's K-12 education system. Detractors, though, argue Nevada is foolishly engaged in ephemeral "smoke-stack chasing" and paying between a reasonable US$55,000 per Gigafactory job to an exorbitant US$400,000 per job, while simultaneously sacrificing the tax base needed for infrastructure projects that Reno's growth demands.

But critics must not overlook a crucial point: one of the deal's primary benefits is to rehabilitate Reno's image. Today, when people think of Reno, they increasingly think of Tesla, surely one of the most innovative companies of recent years, and led by a CEO after whom the producers of the *Iron Man* movie franchise literally patterned the lead character. Not a bad association if the goal is to attract creative, tech-savvy young people. The Gigafactory may do more for Reno's momentum and reputation than any number of marketing dollars could ever achieve.

6. Startup Row

Today, Reno is primed for an entrepreneurial renaissance because the momentum from its industrial technology successes is spilling over. Cities are often tempted to start with programs designed to entice young creatives and entrepreneurs to downtown areas or new technology centers. The lessons from Reno are the opposite: start instead with your natural advantages, expand on your strengths, reach critical mass, and then entrepreneurs will follow.

The criticism du jour for Reno is that it is becoming Silicon Valley's back office. Data centers, e-commerce fulfillment centers, and manufacturing facilities don't provide many high-paying jobs, the criticism goes, and they certainly don't rival the synergies of software engineers gathered in a concentrated area. There's some truth to this

assessment, but you have to start somewhere. And it's best to start with reality and accept who you really are.

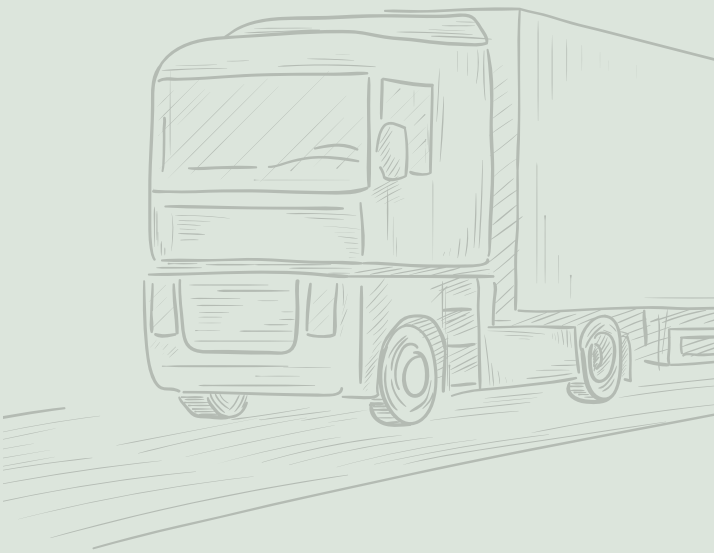
Due to Reno's willingness to embrace non-glamorous support services, logistics, storage, and manufacturing, the city now enjoys undeniable momentum and its own distinct identity. Additional challenges remain, of course, such as whether Reno's start-ups can raise significant venture capital funding, whether Reno can supply a workforce with better technical skills through improved STEM education, and whether the city can diversify its downtown with more corporate headquarters and professional offices alongside the still-dominant casinos. But having first succeeded in exploiting its native competitive advantages, Reno now carries momentum toward surmounting the remaining challenges.

A new vision of Reno is emerging, one in which its natural beauty and a re-energized downtown replace images of seedy casinos. The Truckee River descends from Lake Tahoe and traverses downtown Reno, and where they intersect, an entrepreneurial culture is taking root. Along the newly anointed "Start-up Row," dozens of start-ups have moved in on the banks of the Truckee, complete with Reno's own start-up accelerator/incubator and co-working spaces. In addition, small technology firms in areas such as cybersecurity, web-based commercial real estate services, and drone research and production are beginning to move their headquarters to Reno.

The Federal Aviation Administration (FAA) selected Nevada as one of six sites for testing commercial drones. In 2016, the University of Nevada, Reno (UNR) partnered with NASA to create a drone and virtual reality lab at a Reno airport. Already, a Nevada drone company became the first in the U.S. to complete a fully autonomous drone delivery to a customer's residence – a milestone that just a few years ago would have been unimaginable for Reno. But it is no longer outlandish to think Reno could develop into a drone technology hub, as multiple drone start-ups already operate in the city.

Last year, UNR unveiled a new "Innevation Center" in downtown Reno, with the third floor specifically devoted to research and industry collaboration on drone technologies. The rest of the building is used for all manner of entrepreneurial initiatives designed to build relationships among students, start-ups, investors, and mentors. The Innevation Center was sponsored by Switch, whose data-center investment is already spilling over to enhance the entrepreneurial ecosystem. Similarly, UNR also has begun offering a minor in Batteries and Energy Storage Technologies, developed in cooperation with Tesla.

Countless other urban development projects have taken root. The city renovated the riverfront area to create the Riverwalk path and a whitewater kayaking park on the Truckee, directly in front of Startup Row. Reno's minor league baseball stadium, also downtown on the banks of the Truckee, recently replaced several old buildings, and abandoned casinos are being repurposed into mixed-use lofts, office, and retail space. The casinos themselves are even consolidating and upgrading. Reno's urban renaissance also includes, of course, the requisite trendy coffee shops, breweries, farm-to-table restaurants, ethnic diners, yoga studios, and even a local food co-op.



BURNING MAN

The mystics have always needed the desert. Maybe Silicon Valley does, too. Burning Man was founded on Baker Beach in San Francisco in 1986, but by 1990 it was relocated to the Black Rock Desert north of Reno. Maybe creativity blooms in the desert. Maybe techies need space, or escape, or barrenness to disconnect from modernity and reconnect with humanity. Maybe the creative spirit craves the desert's blank canvas. Maybe the humbling sense of smallness that the harsh, austere desert inspires is paradoxically what arouses bold, imaginative ideas.

To the outside observer, Burning Man is a bizarre gathering – a temporary city constructed on an ancient 400 square-mile lake bed (the "playa") in a wind-swept, flat, and desolate land, where more than 50,000 people set up and share tent dwellings for a few days during the heat of summer in massive concentric circles around a 60-foot statue of a wooden man. Money is not allowed; clothing is optional. The culmination of the radically communal and artistic event is the burning of the wooden effigy. And then the "leave-no-trace" ethos takes over as the entire temporary city is completely dismantled until next year.

Reno enthusiastically welcomes hordes of Burners each year – a city obliged to openness and acceptance, perhaps the remnants of a libertarian bent instilled from Reno's earliest frontier days. Stores in Reno, even the local Wal-Marts, prepare their inventory for the Burners' arrival each year and tout their desert-survival products. The Reno airport rolls out the red carpet for the increase in air travelers. And throughout the year, Reno's Morris Burner Hostel caters to Burning Man aficionados while a local non-profit – The Generator – helps artists prepare for the festival all year long. The Generator offers 34,000 square feet of free workspace, free use of its industrial equipment and tools, and shared collective know-how, all in accordance with Burning Man's creative community ethic.

Complementing the communal spirit of The Generator, one of the anchors of Reno's start-up scene is a co-working accelerator known as The Collective. Local entrepreneurs are drawn to Reno's collaborative environment and pursue a common mission of revitalizing the city. In fact, when Popular Mechanics magazine named Reno as the eighth best start-up city in America in 2015, it highlighted the synergies between the "maker" culture at The Generator and the entrepreneurial mindset along Startup Row.

Among the faithful Burning Man participants are numerous Silicon Valley luminaries: Larry Page, Sergey Brin, Jeff Bezos, Mark Zuckerberg, Elon Musk, and countless more. They come to celebrate creativity, art, community, self-reliance, innovation, rebellion, self-expression, inclusion. It is, in the purest sense, an exaltation of the spirit of entrepreneurship. Musk says you can't fully grasp Silicon Valley if you haven't experienced Burning Man. And so, in ways both tangible and metaphysical, Reno and Silicon Valley are peculiarly inseparable.

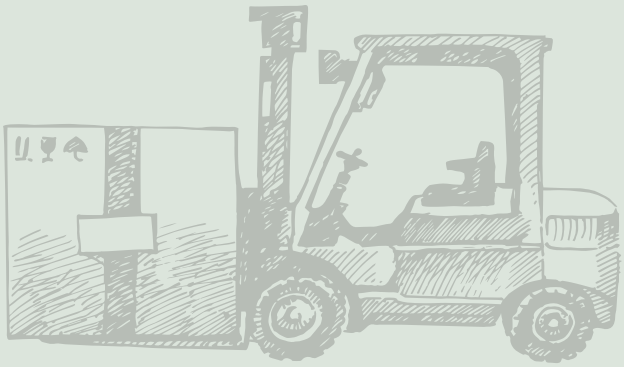
Photo credit: Billie Grace Ward (flickr)

Conclusion

Couple these urban amenities with Reno's enviable outdoor lifestyle, add in Nevada's customary openness to off-beat ideas (see Burning Man box), mix them with an unabashedly pro-business government and the state's flagship university, and you have quite the recipe for a thriving entrepreneurial ecosystem to take root.

But the key is momentum, which must grow organically. Reno's entrepreneurial revival started in the most unlikely of places: warehouses, manufacturing plants, distribution facilities, and data centers. These are not typical building blocks for entrepreneurship. But they fit Reno. They are Reno's competitive advantage. And that natural advantage has attracted big names such as Apple, Amazon, and Tesla, and sparked widespread enthusiasm for the prospects of an enduring renaissance in Reno.

With momentum finally on its side, Reno now girds itself for a home-grown transformation as entrepreneurs step to the forefront to write the next chapter.



FURTHER RESOURCES

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Northern Nevada Regional Growth Study, *2015-2019*. (2015). Economic Planning Indicator Committee (EPIC) Report.

The SILVER Spark for Nevada: Sustainable Innovation Leading a Vital Economic Renaissance. (2011). Nevada Institute of Renewable Energy Commercialization.

Lithium Ion Battery: #HOV8112 *in CIV's History of Venture database*

BEYOND Science Fiction

In 2015, SpaceX CEO Elon Musk launched the Hyperloop competition to create a new mode of transit that will take us beyond planes, trains and automobiles. The goal is to achieve commuter speeds of up to 1,200 km/hour.

Waterloop, a cross-faculty team of Waterloo students, took on the challenge. Their design was chosen from among hundreds to go to the next phase — building a prototype pod to be tested in California.

Following successful demonstration of their groundbreaking levitation system, the team is working hard to transport us into the future much faster than expected.

RENO, 2000–2016 REBRANDING A TARNISHED REPUTATION

Jack Wroldsen
Assistant Professor, Spears School of Business,
Oklahoma State University

civ.global/reno

Inhabitants: 185,000 (2000); 240,000, within a metropolitan area of 500,000 (2016). Nevada's second most populous region after Las Vegas.

The Geographical Context

- Reno's location along western transport routes helped the city gain a foothold as a distribution, logistics, and manufacturing center.
- Being near Silicon Valley attracted big-name technology companies such as Apple, Amazon, and Tesla, albeit for data center facilities, e-commerce distribution warehouses, and manufacturing plants.
- Reno serves as a gateway for outdoor enthusiasts, boasting the primary airport serving Lake Tahoe and resting at the base of the Sierra Nevada mountain range.

Relationship with Government

- Nevada government entities are extremely supportive of Reno's emerging venture ecosystem.
- Entrepreneurs and "Startup Row" are recognized and supported through grants, marketing, awards, start-up fairs, and even street signs.
- Specific initiatives are implemented to bring start-ups (hungry for inexpensive office space) to the revitalized downtown area to occupy previously abandoned buildings, and restoration of downtown riverfront areas makes the city more walkable and attractive.
- Nevada provides an overall business-friendly environment, such as no state income tax for companies or individuals, among numerous other tax-reducing policies. Large incentive packages are offered for technology companies to expand to Reno.

Anchor Institutions

- Governor's Office: The state's "Diversify Nevada" efforts are instrumental in encouraging technology companies to do business in Nevada, and on a local level, EDAWN (or Economic Development Authority of Western Nevada) is a public/private partnership focused on enhancing Reno's evolving venture landscape.
- Tesla's Gigafactory: The Gigafactory has infused Reno with unprecedented momentum for building a venture community, coupled with other large-scale industrial technology developments such as the Apple and Switch data centers.
- University of Nevada, Reno: With a new "Innevation Center" downtown designed to bring the venture community together, and with new programs to support Reno's emerging technology sectors (e.g., batteries and drones), the university is poised to enhance Reno's start-up ecosystem, along with community colleges that are increasingly rolling out programs to develop technical skills.

Venture Statistics

- In 2016, according to the Kauffman Foundation's annual study, Nevada ranked first among all U.S. states in start-up density per capita, and second in start-up activity, which is a per capita measure of several start-up indicators (such as rate of new entrepreneurs and opportunity share for start-up firms).
- Despite Reno's high per capita start-up density and activity rates, though, its historical venture capital financing rate has been low: from 2010 to 2015, Nevada start-ups averaged only six venture capital deals totaling approximately US$20 million each year, according to the National Venture Capital Association.

- In 2017, Nevada placed fifth in the country for having a favorable business tax climate, according to the Tax Foundation.

Strengths

- Existing success with large-scale industrial technology, which creates momentum and spill-over effects for new ventures to launch.
- One of six sites in the U.S. for government-approved experimental research on drone technologies.
- Business-friendly state with low taxes, near the economic engine of Silicon Valley, next to Lake Tahoe and the Sierra Nevada mountain range, with a growing and engaged university.

Weaknesses

- Boom and bust cycle: Throughout its history, Reno has risen and fallen with casinos, mining, and housing, creating an unstable economic base that is overly dependent on outside factors, especially tourism.
- Reputation: Reno has long been the brunt of jokes or parodies in popular culture, reinforcing its image as an undesirable, second-class city.

Ecosystem Players

- Entrepreneur groups: Startup Row, the Reno Collective, the Reno Generator, 1 Million Cups Reno, CUBE start-up incubator, Entrepreneurs Assembly incubator, and the Basement multi-use food incubator.
- University engagement: UNR's Innevation Center, UNR's Ozmen Center for Entrepreneurship, UNR's growing engineering programs, the Desert Research Institute, and local community colleges' technical-skills initiatives.
- Venture financing: Reno Angels, Sierra Angels, the Reno Accelerator Fund, Newbean Capital, EDAWN, and Battle Born Venture.

Strategies Employed

- Stay true to yourself: Start by attracting technology firms in non-glamorous fields that fit Reno's industrial identity (e.g., data centers, e-commerce fulfillment warehouses, manufacturing plants, and solar farms).
- Notch a big win: With an industrial technology base established, aggressively pursue a transformative project, such as Tesla's Gigafactory, which immediately rebrands Reno's reputation as a place for innovative companies to be.
- Capitalize on momentum: Building from the attention the Gigafactory generates, pursue urban revitalization to attract young professionals to the city center and integrate the university into Reno's emerging venture community.

Results

- Culture: Natives and transplants alike marvel at Reno's entrepreneurial momentum and urban transformation with sentiments like "Reno seems like Austin 20 years ago" or "Reno's restaurant scene resembles a small Chicago or New York." The change in mentality is perhaps the most meaningful result for the city.
- Jobs: Estimated 50,000 new jobs by 2020.
- Housing: Expected need for 9,000 new housing units per year for five years (6,000 new units is Reno's highest one-year total ever, which occurred in 2005 at the peak of the housing bubble).
- University of Nevada, Reno: New engineering and business buildings will extend the campus into a pedestrian-only "Innovation Alley" downtown.

Lessons and Conclusions

The primary lesson from Reno is to discover and enhance inherent virtues, not try to emulate others. Attempts to establish venture communities often pursue a familiar recipe of mixing venture capital funding with creative entrepreneurs, a vibrant university, and a network of support professionals – all great ingredients in the right context. But each context is unique, and Reno's entrepreneurial ecosystem is emerging from an atypical confluence of factors that fit Reno's identity as an industrial support center: manufacturing, warehousing, distribution, storage – a humble mix.

Success breeds success, though, no matter the industry. And as a result, Reno now has undeniable momentum toward building a home-grown venture community that it never could have achieved without first embracing its natural competitive advantages to rebrand its reputation as an industrial technology hub.

DEALING WITH POLITICAL CHANGE

ASSESSING LONDON'S POST-BREXIT COMPETITIVENESS

civ.global/brexit

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Eze Vidra
Chief Innovation Officer, Antidote

Introduction

With Brexit looming, the uncertainty about London's economic future is at its peak. The government's Tech City policy initiative, launched in 2010 by then prime minister David Cameron, led to a transformation of London. It marked the inception of London as a major venture hub, attracting founders from all over Europe and catapulting London into becoming a leading Fintech cluster.

But what happens next? Can London survive without being part of the single European Union market and without the free flow of talent?

CAN TECH CITY SURVIVE WITHOUT BEING PART OF THE SINGLE EUROPEAN UNION MARKET?

To offer some answers to these important questions, this article examines the durability of key components of London's Venture Fabric: availability of talent, access to capital across stages, and the density of network required to help start-ups scale. Insights are derived from primary data collected through a survey of 104 London-based entrepreneurs, asking how Brexit affects staffing, funding, and the vibrancy of the capital's venture network as of the fourth quarter of 2016. Findings were triangulated by interviewing leading members of the London venture ecosystem in October 2016.

The article provides a new and actionable understanding of the London venture community's ability to survive, or even thrive, in a post-Brexit context.

1. Before Brexit

I moved to London from San Francisco in 2008 to start my MBA at London Business School. As an active participant in the start-up ecosystem, the contrast between the two cities was evident to me. Silicon Valley is the undisputed center of activity for start-ups in the U.S. (and arguably, the world). Smart engineers from all over the world flock to the Valley to start and join some of the world's most exciting technology start-ups: Google, Facebook, Apple – just to name a few.

In London in 2008, in contrast to start-up-centric Silicon Valley, the career ambition for business school graduates was banking or consulting. While there was a small group of tech start-ups (Huddle, Moo, BetFair) at the time, there wasn't much of a community or cluster: there were very few start-up events worth attending, only a couple of co-working spaces, and just one start-up accelerator program (Seedcamp).

That year, the collapse of Lehman Brothers and the onset of the global financial crisis had a profound impact on London's economy. Financial services collapsed, triggering massive layoffs and, perhaps most importantly, a re-think of the source of London's sustainable competitiveness. It was clear that the United Kingdom needed a more diverse services economy and a broader set of industry expertise.

On November 4, 2010, prime minister David Cameron announced to a group of business leaders in East London the creation of "Tech City," a government initiative to turn a roundabout in Shoreditch, East London into a hub of venture activity:

"Right now, Silicon Valley is the leading place in the world for high-tech growth and innovation. But there's no reason why it has to be so predominant. Our ambition is to bring together the creativity and energy of Shoreditch and the incredible possibilities of the Olympic Park to help make East London one of the world's great technology centres. I want to show you how we can get there."

It represented a change of ambition in the U.K., as the government wanted to position London as more than a world financial center. The launch of Tech City was followed by a range of measures aimed at improving the climate for technology and entrepreneurship in the country.

Those policies included an Entrepreneur Visa to enable immigrants to set up their businesses in the U.K., tax breaks for start-up investors (Enterprise Investment Scheme, or EIS, and Seed Enterprise Investment Scheme, or SEIS), and courting of large multi-national companies to support this ambition. At the time, in 2010, there were about 85 start-up companies in the East London cluster.

Fast forward to March 31, 2012 when George Osborne, then the chancellor of the exchequer, gave a speech at the opening of Google Campus, a seven-story building dedicated to start-ups in the heart of "Silicon Roundabout." Google was the first tech giant to establish a presence in East London, and created what became a symbol and the heart of this new technology cluster.

LONDON BECAME AN ATTRACTIVE HUB FOR VENTURE INVESTMENT

I was the founding head of Campus, Google's first start-up campus globally. In our first year of operations, Campus hosted about 1,000 technology events and was home to more than 30,000 registered members. We facilitated mentorship programs, brought prominent speakers from the United States to share their knowledge and partnered with six accelerators and two co-working spaces in the first two years of operations. Something had clearly changed – London had the beginnings of a burgeoning hub of venture activity.

In 2011, 200 start-ups were recorded as being based in Tech City. By the end of 2012, according to Techcitymap.com, the number of digital businesses operating in Tech City grew to more than 1,000.

As of October 2016, there were 9,457 start-ups based in London, 156 co-working spaces with 2,100 available desks for rent, and 92 start-up accelerator programs. As of the beginning of 2017, the U.K. is the leading center of European entrepreneurship, with 40 percent of Europe's "Unicorns" (start-ups with a valuation of US$1 billion and above).

In addition to start-ups, London is the regional hub for most large technology multi-nationals including Google, Facebook, Microsoft, and Amazon and it is largely used as the European headquarters for the world's fastest growing tech companies such as Uber and Airbnb.

Of the total venture capital invested in Europe in 2015 (US$13.5 billion), about a third has been invested in the U.K. (US$3.6 billion). Of the total capital raised in the U.K. in 2015, 63% (US$2.28 billion) was raised in London. This represents about a 70% increase from the VC funding raised in 2014 (US$2.1 billion).

By 2015, London became an attractive hub for venture investment for several reasons: its density of network, talent flowing from Oxford, Cambridge, and other European hubs, and a formidable concentration of investors across stages. London became a global hub for Fintech and fashion, attracting founders from all over Europe to set up shop in the U.K., and venture capital followed.

Then, on June 23, 2016, 52% of the British voting population voted to leave the E.U. Brexit was born.

2. Brexit

London's venture ecosystem leaders were left reeling by the Brexit news, and are asking how Brexit – tough talk from politicians about disconnecting from the single market and restricting labor flows – affects London's competitiveness as a venture hub. Can London remain the European center for venture activity? Will venture capital earmarked for European funds continue to flow to British VCs and start-ups?

LONDON'S VENTURE ECOSYSTEM LEADERS WERE LEFT REELING BY THE BREXIT NEWS

With approximately 50% of the LP (Limited Partner) funding for London's venture capital funds coming from E.U. institutional sources such as the European Investment Fund (EIF), and a large percentage of the scientific funding coming from the E.U., will the U.K. tech ecosystem be able to thrive post-Brexit?

Research conducted by Tech City just after the vote gave some indication of the potential impact. The summary of the Tech City poll results in July 2016 shows the venture community is hoping for a "Soft Brexit," with the outcome of Brexit including the ability for European talent to continue to flow into London and the U.K.'s access to the Single Market:

- 70% of employers surveyed want to hear a clear message on E.U. residents' ability to live and work in the country.
- 85% want to see the government negotiate to remain part of the European Single Market.
- Just under a quarter (22%) expect to scale back their planned growth ambitions.

On January 6, 2017, the pound traded at US$1.23 (compared to US$1.539 in October 2015), flirting with breaking its own record after piercing a 35-year low over the summer. British GDP is stable and housing prices don't show a clear trend. However, regular announcements are made about companies, especially banks, relocating their headquarters to continental European capitals such as Amsterdam, Frankfurt, Luxembourg, and Paris in order to maintain their "Passporting." (According to the Financial Conduct Authority [FCA], if a U.K.-authorized firm wants to provide financial advice, set up a base, or run permitted activities in a European Economic Area [EEA] state, it needs to apply for a "passport.")

For those who hoped Brexit would never materialize, hopes were dashed as new U.K. Prime Minister Theresa May announced that Article 50 would be triggered in March 2017. These intentions to deliver on the Brexit vote, coupled with harsh political rhetoric from British and European politicians about the terms of Brexit, have shaken the confidence of what was an energetic venture ecosystem.

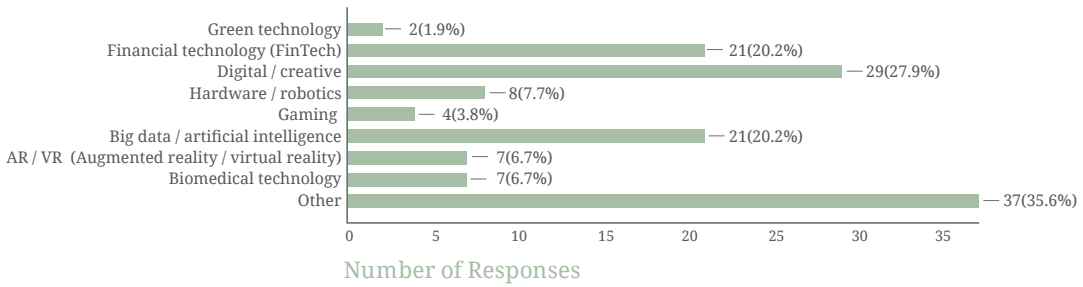
3. New Evidence of the Impact of Brexit on London's Venture Ecosystem

Exploring what the venture ecosystem was thinking toward the end of 2016, in October 2016 I surveyed 104 members of the London start-up community and interviewed key leaders of the community. Here is a summary of the profiles of the respondents to my survey:

- Positions in the ecosystem:
  - 41.3% of respondents were company founders or CEOs
  - 20.2% were start-up team members
  - 10.3% were investors.
- 51% of respondents were British citizens, followed by 29.8% European.

The survey respondents' distribution of sectors, as illustrated in Figure 1 below, is a good reflection of the U.K.'s start-up activity.

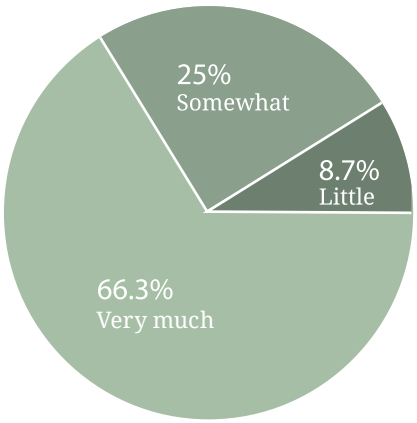
Figure 1: Distribution of Survey Respondents by Sector (104 responses)
Source: Author analysis



Top-level results
While the effect of Brexit hasn't yet been fully felt, the majority (66.3%) of respondents expressed that it would "very much" have an impact on London's start-up ecosystem.

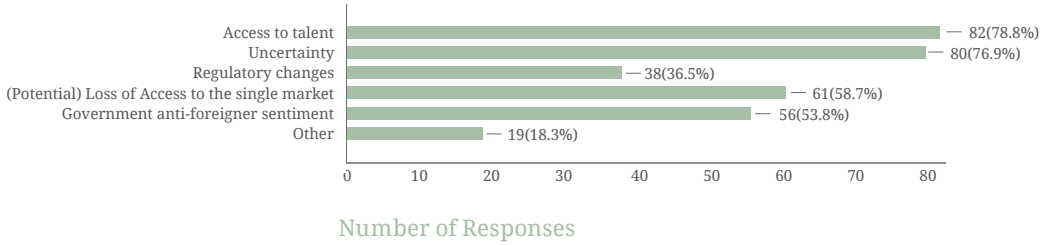
Not a single respondent said that Brexit would have no impact, and fewer than 10% felt that the impact would be "little".

Figure 2: Survey Responses: How Much Does Brexit Affect London's Ecosystem? (104 responses)
Source: Author analysis



To understand the areas in which the impact was felt, I asked them to select all relevant answers.

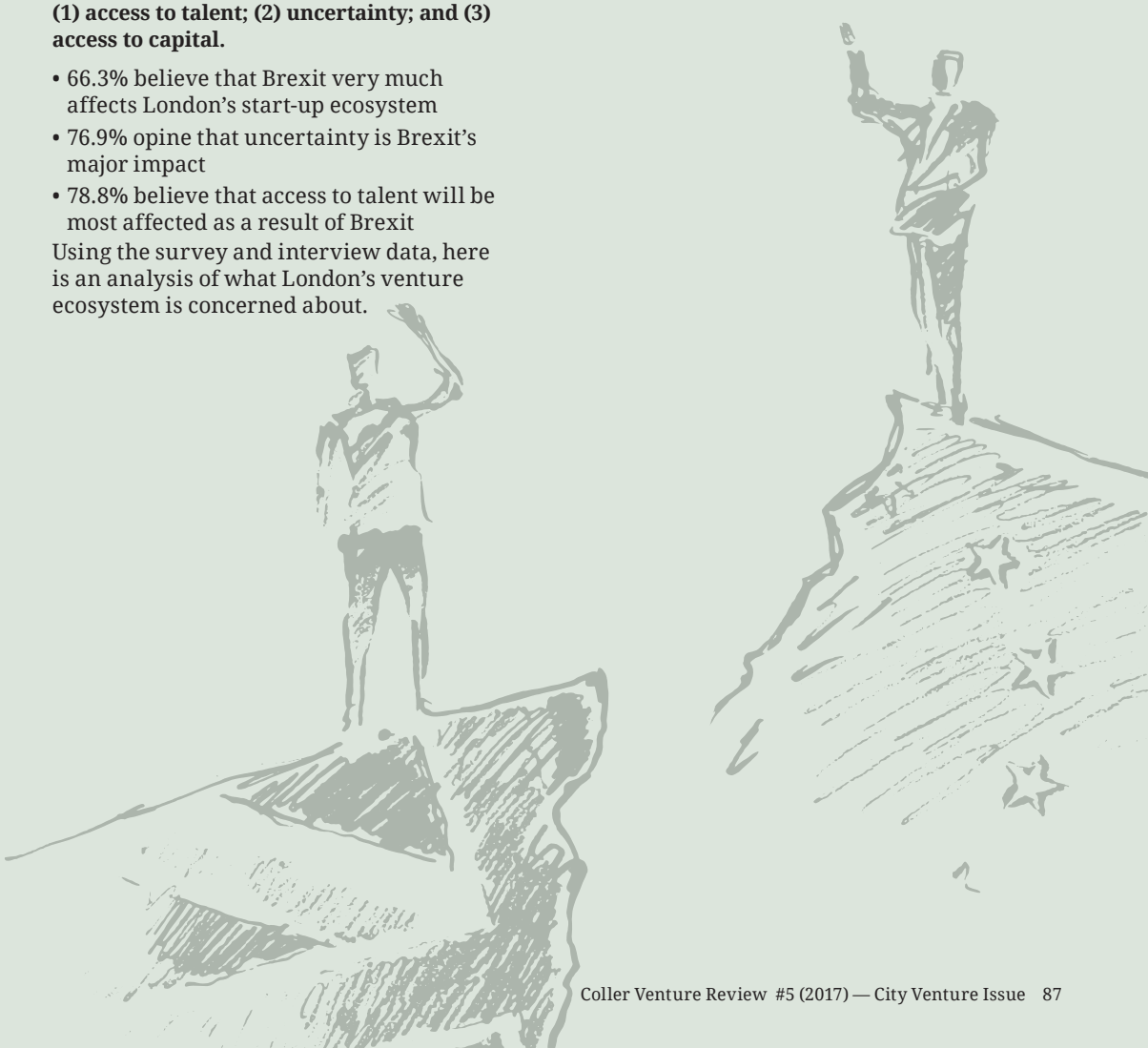
Figure 3: Survey Responses: Which Aspects of Brexit Most Affect Entrepreneurship in London? (104 responses)
Source: Author analysis



As figure 3 shows, the survey results pointed to three critical aspects in which Brexit is affecting the London venture ecosystem. The concerns primarily manifest in terms of: **(1) access to talent; (2) uncertainty; and (3) access to capital.**

- 66.3% believe that Brexit very much affects London's start-up ecosystem
- 76.9% opine that uncertainty is Brexit's major impact
- 78.8% believe that access to talent will be most affected as a result of Brexit

Using the survey and interview data, here is an analysis of what London's venture ecosystem is concerned about.



4. Analysis

Access to talent

Free movement between the U.K. and the E.U. made London the top tech talent pool in Europe. There are approximately 1.56 million jobs in the digital tech sector in the U.K. alone. The sector is creating jobs almost three times faster than the traditional economy, but the supply of specialist skills employees is not growing as fast as the demand. Start-ups compete on talent with each other, as well as large companies, so hiring international talent is essential for growth. This concern has been consistent from before the referendum, and prompted a group of fast-growing start-ups to publish an open letter in October 2016 urging the government to ensure that access to talent is preserved post-Brexit.

AS "HARD BREXIT" LOOMS, THE UNCERTAINTY BEGS A HIGH PRICE

Supporting comments from respondents:

- "For a start-up, the team is very important. Sometimes we need the best in a particular field, sometimes we need affordable team members. Very rarely all these people happen to live in the same place. I moved from Madrid to London to start my tech business. If the U.K. weren't part of the E.U., I would have never considered it. I would have chosen California or Germany, both of which are great start-up ecosystems and part of a great community (U.S./E.U.) from which you can find your team members."
- "Risk of access to talent diminishing, risk of not being somewhere talent wants to live."

In an interview with Gerard Grech, CEO of Tech City UK, he confirmed this was indeed the key challenge: "The government has a challenge – squaring the business need (foreign talent and certainty) with a political situation where some people are disenfranchised."

Another factor related to access to talent is the rise of anti-immigration sentiment. Police statistics have shown a sharp rise in Islamophobic, anti-Semitic, and political discourse in the U.K. particularly focusing on immigration. This affects not only the inflow of new talent but also foreign employees who are currently working in the tech sector. Respondents expressed concern about the environment and its impact on talent:

- "If the government goes down the anti-immigrant route, how are start-ups supposed to hire the talents they need? If Britain loses access to the single market, why would U.S. companies be starting European operations in London? The ecosystem is likely to shrink because of Brexit, which will hurt the ecosystem."
- "The unique selling point of London is its diversity, along with ease of access to a single market and a great pool of talents. Post-Brexit U.K. seems to be heading towards taking this out and sends a strong message that Europeans are not welcome."

Uncertainty can be debilitating

Will immigrants be asked to leave? Will the pound continue to fall? These are just some of the questions on people's minds, and while there has been a lot of analysis the answer is that nobody knows for sure. As "Hard Brexit" is being portended by the current administration, the uncertainty begs a high price.

Regarding this survey, respondents said things like:

- "Uncertainty leads to missed opportunities, decisions being made and so forth that have immediate effects. So, even though we have no idea what will happen, things are happening already in that vacuum."
- "Uncertainty – we were to set up a U.K.-based HQ, but decided not to and go straight to Delaware, due to Brexit. In medical devices, regulations and market access are key and the E.U. is segregated enough."

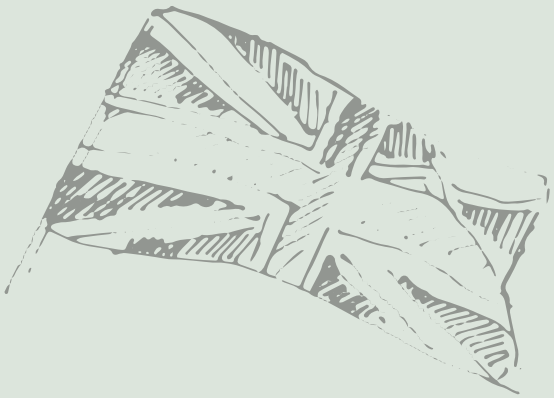
That said, some respondents maintained a cautious optimism:

- "Too soon to say since I think it highly likely it will not affect the ability to recruit from overseas talented people nor access to the European market. I think the possible side effects are overblown. Global trade deals and a weaker sterling

could in fact boost investment in the U.K."

- "Positive side: will create massive disruption of ecosystems, which always creates opportunities for savvy entrepreneurs. Negatives: will decrease cash available for investment, will decrease diversity of staff which will lead to less diversity of ideas and approaches to problem-solving, which will lead to under-performing businesses that will be slower to adapt to markets/competition."

The government maintains that with Brexit must come opportunities for growth, as it will free the U.K. from the regulatory "shackles" of the E.U. — so far it hasn't played out that way. And, London's venture community is not comforted by that sentiment.



Access to capital worries VCs and start-ups

The access to capital risk is shared by investors and entrepreneurs. The main concern when it comes to availability of venture funding is LP drawdown, as approximately 50% of European venture funding originates from public sources, namely the European Investment Bank (EIB).

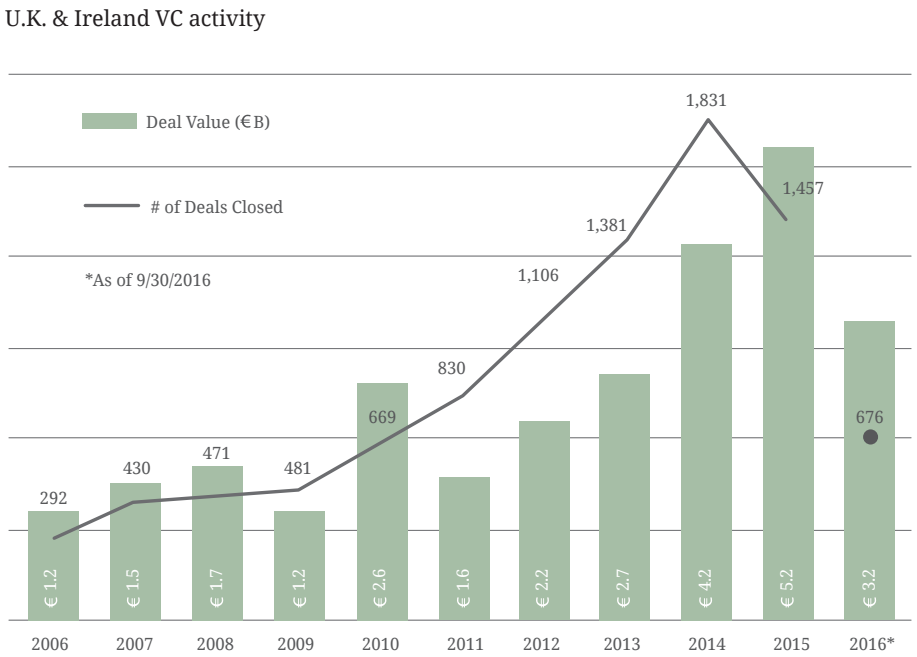
One respondent noted in the survey:

- "Quite a few of my funds' LPs operate out of London. After the vote, they are either moving operations or holding off on new deployments."

Looking at the current investment levels in the U.K., Brexit has yet to make a big impact. U.K. start-ups raised US$830 million in venture capital funding in Q3 2016, compared to US$653 million in the previous quarter, but 36% less than in the same period last year, according to data from Dealroom Research Group.

So, while investment levels remain solid, the concerns about the real impact of Brexit remain, with immigration being the leading factor. Just over half the founders of U.K. tech start-ups in 2015 were of British nationality, according to a study undertaken by Balderton Capital.

Figure 4: U.K. and Ireland VC Activity Over Time
Source: Pitchbook's 3Q 2016 European Venture Industry Report



The fear is that the government's tone of "Hard Brexit" may undermine years of effort of building London's tech ecosystem, in particular for Fintech, London's strongest cluster. Losing the single market access will mean losing "passporting," a critical regulatory framework for cross-border transactions.

LOOKING AT THE CURRENT INVESTMENT LEVELS IN THE U.K., BREXIT HAS YET TO MAKE A BIG IMPACT

That may mean that activity in this space may shift to Amsterdam, Berlin, and Stockholm.

As respondents noted, start-ups are more vulnerable to these risks:

- "Uncertainty on E.U. passporting of financial services, costs to access the European market, access to Eastern European coding talent. This can be stomached by large corporates; start-ups have no idea how it will impact their fundraising and could face running out of money earlier than expected."
- "Particularly in Fintech, the market uncertainty has affected start-ups the most. They don't have the financial stability of incumbents to work through turbulent conditions and there has been a lack of funding due to these uncertainties in markets these start-ups are entering."

Conclusion

The tech sector was largely in favor of remaining in the E.U., and the news about Brexit was received almost in disbelief. With "Hard Brexit" looming, some start-ups and investors are proceeding with caution while others are leveraging the opportunity to speed up internationalization and diversify their risk. Uncertainty hints that it will be a bumpy road ahead.

For other European start-up hubs, such as Amsterdam and Berlin, this may seem like a golden opportunity, but it will be hard to replicate London's density of network, diversity of talent, and concentration of capital in the short term.

Gerard Grech, CEO of Tech City, commented: "I've spoken to CEOs who looked at Amsterdam and Berlin – when they take everything into consideration – tax, labor laws, etc., the regulatory environment is so much better in the U.K. compared to other places. For now they're staying put."

For the U.K. government, the message from entrepreneurs is clear: they must create the right regulatory environment to ensure that tech continues to be at the forefront post-Brexit. The U.K. government should consider the following policy recommendations:

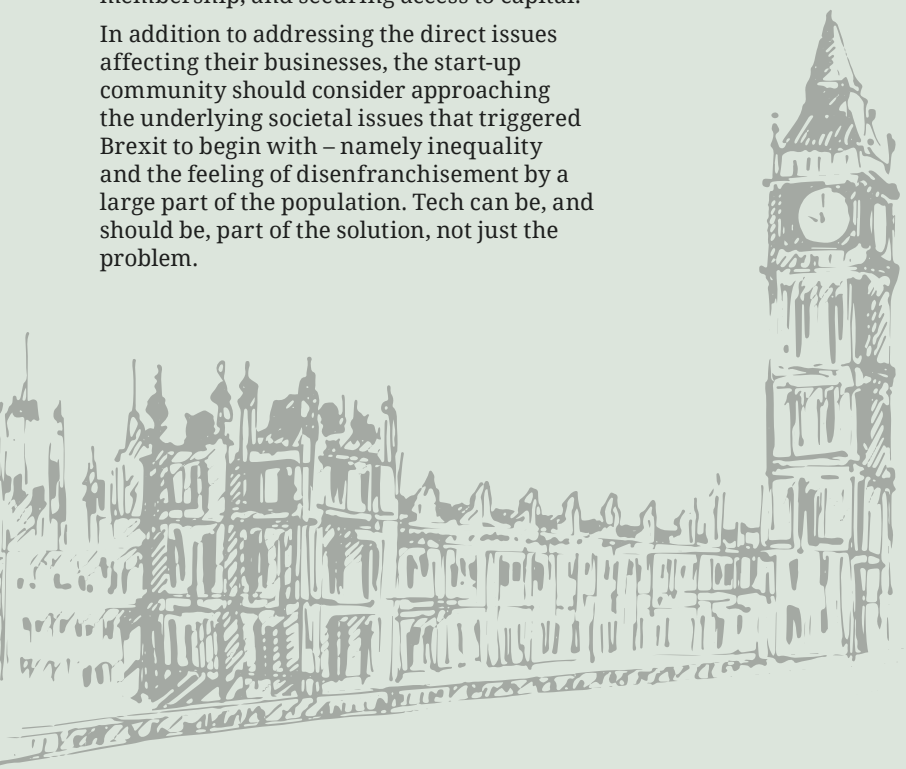
1. Secure access to international talent, with a focus on technical talent. The entrepreneur visa that is currently in place is not flexible enough to cover software engineers, designers, and QA testers, roles that are in high demand and can't be fully filled with U.K.-only talent.

2. Empower start-ups to conduct international business – losing access to the single E.U. market poses challenges to all transactional start-ups, particularly in Fintech. Settling "passporting" is essential.
3. Ensure access to capital across stages – Brexit is slowing the direct rate of investments, but more importantly it could really dry up a major source of LP capital into the funds. The government must act to ensure there is enough venture capital to support the growth of the tech industry.

TECH CAN BE, AND SHOULD BE, PART OF THE SOLUTION, NOT JUST THE PROBLEM

Looking to the future, the onus is on the tech community to organize itself and educate the administration as quickly as possible on the need to keep the U.K. at the forefront of tech. This includes work visas for international talent, the regulatory framework to conduct cross-border business in lieu of single market membership, and securing access to capital.

In addition to addressing the direct issues affecting their businesses, the start-up community should consider approaching the underlying societal issues that triggered Brexit to begin with – namely inequality and the feeling of disenfranchisement by a large part of the population. Tech can be, and should be, part of the solution, not just the problem.



FURTHER RESOURCES

Prime Minister David Cameron announces East London 'Tech City' https://www.gov.uk/government/news/pm-announces-east-london-tech-city

UK tech sector raises $3.6bn in venture capital in 2015 https://www.ft.com/content/fad8a17a-b38e-11e5-b147-e5e5bba42e51

Cause for Optimism as UK Tech Rises to Brexit Challenge http://www.techcityuk.com/blog/2016/07/tech-reaction-to-brexit/

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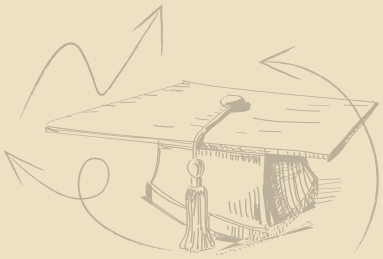

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Robert Huggins
Professor and Director of Research, School of Geography and Planning, Cardiff University

KEY FACTORS OF CITY SUCCESS

HOW CAPITAL, INSTITUTIONS, AND PSYCHO-CULTURAL BEHAVIOR PROMOTE ECONOMIC GROWTH

Introduction

A perennial question in the field of urban development is why some cities are better able to foster innovation and ventures than others. A myriad of factors relating to the availability of investment and resources, the skills of the workforce, the availability and capability of entrepreneurs and other agents of innovation, as well as the cooperation and collaboration achieved through ecosystems are all offered as explanatory factors. Undoubtedly, each is likely to matter, however there is little understanding of how these factors are related or connected.

In response to this, this article examines in a systemic manner both the structural and behavioral determinants of the innovation and growth capability and capacity of firms within cities.

THE APPROACH ADOPTED HERE ECHOES THE NOTION OF CITIES AS "SCHUMPETERIAN HUBS"

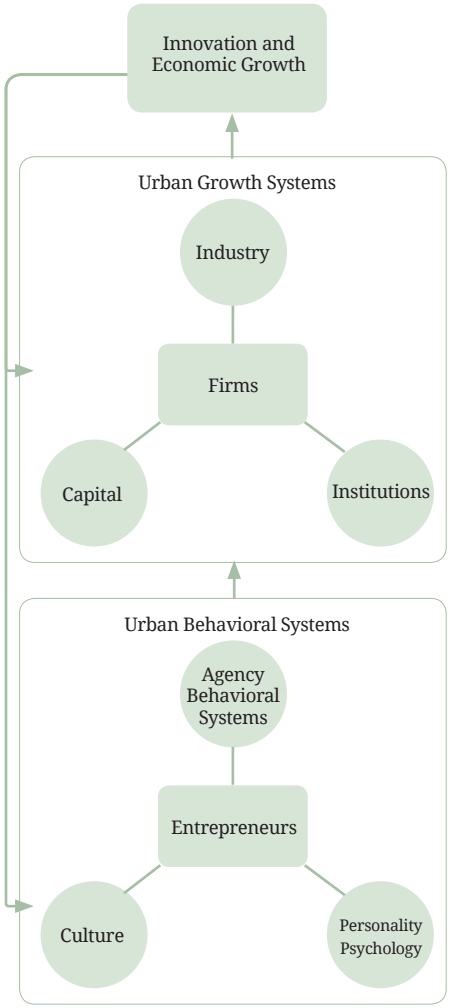
From the structural perspective, cities are portrayed as urban growth systems whereby the availability of a range of capital forms and the quality of institutions play a key role in promoting firm level innovation and growth. However, this capital and associated institutions may lack effectiveness unless a city contains significant numbers of individuals, especially entrepreneurs, with the behavioral, cultural, and personality traits that allow them to act as agents of innovation within their respective cities.

These more behavioral aspects can be considered to underpin the functioning of city growth systems and key behavioral traits within cities, namely socio-spatial culture and personality psychology. Clearly, behavioral action will result in a range of activities, and from the perspective of innovation it is important to pinpoint actions in the form of human agency that may impact on the development outcomes of a particular city.

In general, the approach adopted here echoes the notion of cities as "Schumpeterian hubs" for recombining capital in order to generate innovation. The article argues, however, that merely investing in such capital may not be enough to secure innovation and high rates of economic growth. In particular, investing in knowledge alone may not necessarily lead to improved innovation and growth.

In summary, the overall model the author presents is illustrated by Figure 1, which highlights the inter-connection of urban growth systems and urban behavioral systems as the drivers of innovation within a city.

Figure 1: The Determinants of City Innovation and Economic Growth: The Inter-Connection of Urban Growth Systems and Behavioral Systems
Source: Author analysis



1. Capital

Innovation (or endogenous) growth models make clear that economic growth is considered to be driven by technological change arising from intentional investment decisions made by profit-maximizing agents (principally firms) with the stock of human and knowledge capital – and investments in such capital – determining the rate of growth.

INSTITUTIONS RELATE TO INCENTIVES AND CONSTRAINTS CONCERNING THE ORGANIZATION OF PRODUCTION

Knowledge capital refers to the cumulative stock of information and skills concerned with connecting new ideas with commercial values, developing new products and processes, and, as a result, doing business in a new way. Therefore, whereas innovation is a process, knowledge consists of the recipes and ingredients to be processed.

Figure 2 shows the relationship between R&D expenditure and Gross Domestic Product (GDP) per capita across more than 500 cities and regions across the globe, indicating a strong and positive correlation between investment in innovation and knowledge capital and long-term economic growth capacity at the city and regional level.

2. Institutions

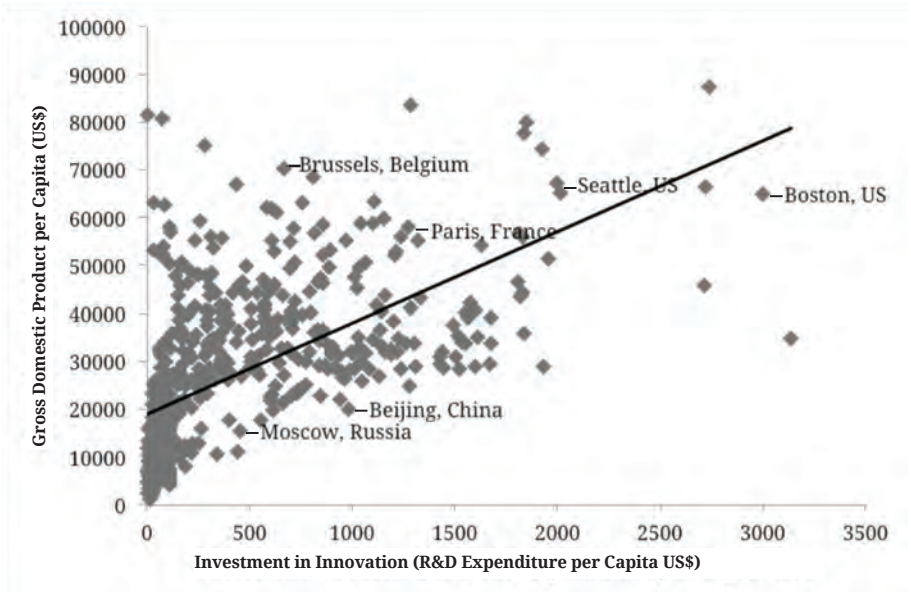
Alongside the innovation model of growth, an emerging field of economic study has sought to cut into the growth debate at a different level by placing the concept of institutions as the central source for understanding growth differentials. In this sense, institutions relate to the incentives and constraints concerning the organization of production.

Within this institutional paradigm, the prevailing view is that differences in "the rules of the game" across economic systems are a key driver of growth differentials, with more efficient institutions facilitating the development of the conditions that allow the forms of capital accumulation associated with innovation-led growth to flourish.

While some of these institutions are fixed across nations – such as law, regulation, and property rights – others may be subject to city-level differentiation. In this sense, city-

Figure 2: Relationship between Investment in Innovation (R&D Expenditure per Capita in US$) and GDP per Capita across 546 Cities and Regions (2009/2010)

Source: Based on Huggins, R., Izushi, H., Prokop, D. & Thompson, P. (2014). The Global Competitiveness of Regions. Routledge.



level institutions can be considered to consist of the underlying rules of the game relating to factors such as the incentives to save and invest; embracing competition, innovation, and technological development; engaging in education and learning; engaging in entrepreneurship; and participating in networks, along with the presence and structure of property ownership and the provision of public services.

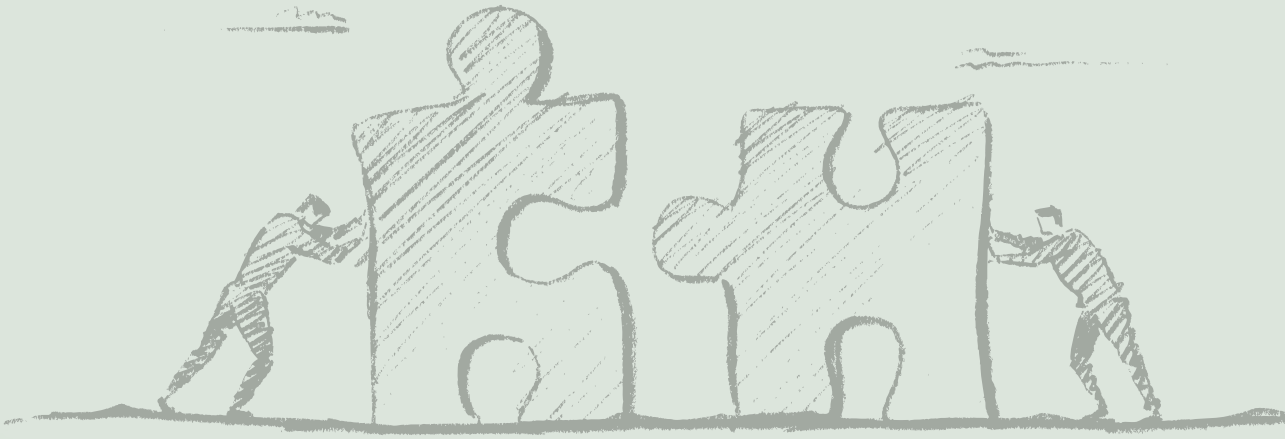
3. Urban Growth Systems

Recent work on urban development has sought to develop a more transparent link between institutional and capital accumulation theories of growth, whereby city economies are conceptualized as growth systems through which different forms of institutions are associated with different forms of capital accumulation. Building on the existing acknowledgment that both capital and institutional factors influence innovation and growth, three dynamics are considered to be at play within cities: (1) firm-level growth dynamics; (2) inter-firm-level growth dynamics; and (3) city-level growth dynamics.

Although each growth dynamic will help shape and determine rates of economic growth, the firm level is clearly central with regard to the dynamics of knowledge creation. Firms are dependent on the role of human capital, in the form of the skills base of a city, and knowledge capital, in the form of the technology and research expertise available for innovation, and, therefore, the learning and innovation institutions that constrain or incentivize the accumulation of these forms of capital.

In the case of human capital, learning institutions, such as intra-regional and inter-regional labor markets, create incentives and constraints as to the type of human capital formed in a particular city, as well as conventions in relation to workforce development and city education systems. Institutions in the form of labor markets enable human capital, in the form of skilled and talented individuals, to take advantage of the benefits of specialization, encouraging economic growth.

With regard to knowledge capital, there is a need to consider innovation institutions in the form of the incentives for and constraints on creating and/or embracing new technology, as well as conventions in relation to the financing of innovation and norms regarding the restriction or freedom of ideas. For example, where innovative opportunity exploitation is encouraged through greater rewards (e.g., lower effective tax rates) or at the very least are not discouraged (as might be the case where high administrative burdens are present), the marginal latent innovator is more likely to pursue innovation opportunities. Less formal institutions in the shape of the nature of competition are also likely to play an equal, if not stronger role in shaping the knowledge capital capacity of a city.



Alongside firm-level dynamics, it is increasingly argued that the inter-firm level has grown in importance, as it is the flow and diffusion of created knowledge that will determine long-run rates of innovation. Inter-firm level growth dynamics concern the transactions and interactions across economic agents, with the effectiveness of firms to enter and successfully compete in their respective markets being likely to rely on the accumulation of entrepreneurship capital, referring to the capacity of a city to generate entrepreneurial activity, whereby entrepreneurs are alert to market opportunities and subsequently contribute to economic growth.

In this conceptualization, entrepreneurship capital encompasses not only the available entrepreneurial talent that allows firms to operate in high value and tradable markets, but also the capability to access the finance entrepreneurs may need to invest in the resources required to engage in these markets. Entrepreneurial institutions come in the form of the incentives and constraints to engaging in entrepreneurial activity, including property rights, tax codes, social insurance systems, labor market legislation, competition policy, trade policies, capital market regulation, and the enforcement of contracts and law and order.

Alongside markets, recent research has identified the role of both inter- and intra-city networks as a type of capital shaping urban growth processes, i.e., network capital, in the form of investments firms make in cooperation and collaborative relationships with other firms and organizations in order to gain access to economically beneficial knowledge. In this case, the capital value of networks within and across cities is likely to be regulated by a series of "associational institutions" in the form of conventions with regard to inter-organizational collaboration and cooperation, especially associational business behavior and the norms of trust and collective action.

Figure 3 shows the relationship between network capital (a composite measure based on the frequency of accessing knowledge multiplied by the value of this knowledge) and Gross Value Added (GVA) per Capita across cities and localities in the U.K. As can be seen, higher levels of available network capital and high rates of economic output appear to go hand-in-hand.

Cities are considered to be key locations for high rates of network formation due to the high density of actors and high frequency of human interactions. An institutional perspective on these networks and flows suggests that firms are incentivized to engage in networked activity through the availability of formal associational institutions such as chambers of commerce, business and trade associations, as well as more informal institutions in the form of the geographic clustering of firms within which

Figure 3: Relationship between Network Capital and GVA per Capita across Cities and Local Areas of the U.K., 2013
Source: Huggins, R. and Thompson, P. (2014). "Networks, Knowledge and Regional Growth: An Empirical Analysis"

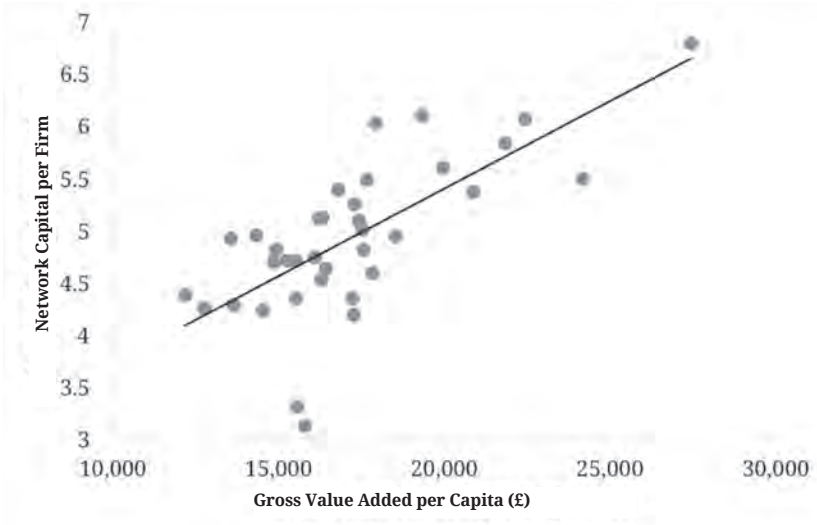


Figure 4: Knowledge Networks in London and the North East of England (Based on Links between Universities and Firms and Other Organizations)

Source: Huggins, R., and Prokop, D. (2016). "Network structure and regional innovation: A study of university–industry ties"

London

North East of England

○ Firms and other organizations in the region

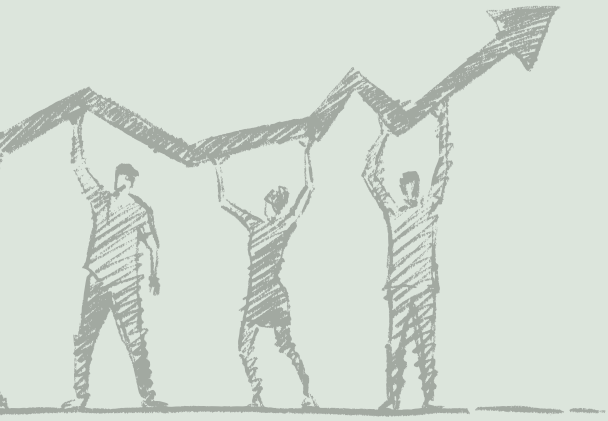
◉ Universities outside the region

● Universities in the region

networked cooperation and collaboration is fostered through embedded institutional norms and customs.

Figure 4 illustrates the knowledge networks that exist between firms and other organizations with universities in London and the North East of England (i.e., principally the city of Newcastle-upon-Tyne and it surrounds).

In the innovation rich and high growth city of London, it is clear that the level of network ties is far denser than the relatively sparse and fragmented ties found in the less innovative and more economically peripheral North East. This is, perhaps, unsurprising given the greater number of businesses that are located in London. However, it does mean that even when controlling for size, firms in London are far more centrally positioned in these knowledge networks compared with counterpart firms in relatively low growth regions such as the North East.



4. Behavioral Urban Systems

As indicated earlier, explanations of innovation and growth differences across cities are generally rooted in factors based on the structure, dynamics, and organization of firms, industries, and capital. Based on thinking from behavioral economics, however, contemporary theories are increasingly moving toward addressing the role of individual and collective behavior in determining innovation and growth outcomes across cities.

Behavioral economics concerns the integration of psychological theories of behavior as a means of explaining economic action. Such theories have increasingly shown the limits of rational-choice theories in explaining economic, as well as social, action, and the underlying decision-making processes of individuals in determining such action.

Drawing on Herbert Simon's notion of "bounded rationality," behavioral economics suggests that the minds of individuals are required to be understood in terms of the environmental context in which they have

evolved, resulting in restrictions to human information processing, due to limits in knowledge and computational capacity. Therefore, the "city" itself may act as an important contextual factor influencing behavior.

Similarly, the rise in importance given to cultural values in urban development theory has led to the emergence of a "new sociology of development" that entwines the role of geography with factors relating to individual and collective behavior. Therefore, if we are to fully explore differences in innovation and growth across cities, there is a need to understand how these differences stem from the behavior of human agents. From this psychological perspective it is instructive to draw on the Five-Factor Theory of Personality – the Big Five traits – to explain differences in behavior across cities, consisting of: (1) openness; (2) conscientiousness; (3) extraversion; (4) agreeableness; and (5) neuroticism (emotional stability).

TOGETHER, CULTURE AND PERSONALITY PSYCHOLOGY FORM THE PSYCHO-CULTURAL BEHAVIOR OF A CITY

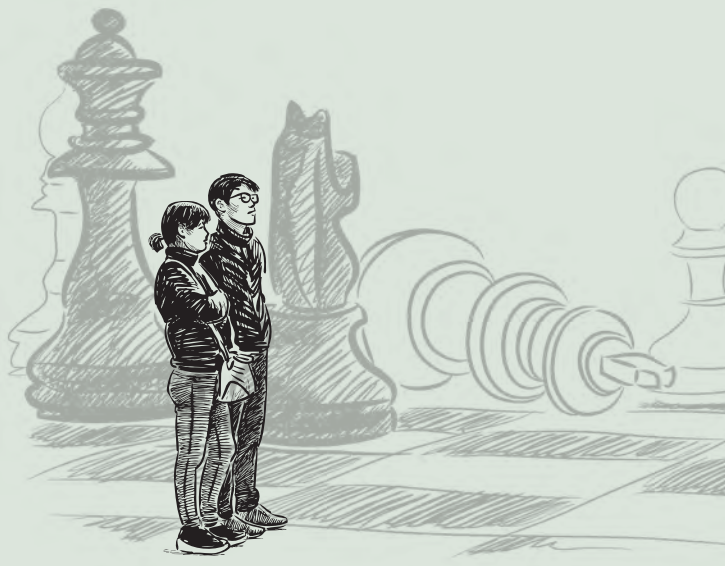
Alongside these personality psychologies, the concept of culture generally refers to the way in which people behave, often as a result of their background and group affiliation. Rather than concerning individual behavior, it relates to shared systems of meaning within and across ascribed and acquired social groups, in this case within cities. Piers Thompson and I have established a model of socio-spatial (or "community") culture whereby five component factors are argued to be of principal importance in the context of cities, namely: (1) engagement with education and work; (2) social cohesion; (3) femininity and caring attitudes; (4) adherence to social rules; and (5) collective action.

Both personality and cultural traits have been found to be factors influencing rates of entrepreneurship, innovation, and growth across cities. In particular, individualism, diversity, and more masculine cultures have been found to be associated with these outcomes. Furthermore, a group of studies inspired by Richard Florida has found that open tolerant cities grow faster, reflecting the attraction of both conventional human capital and a greater presence of the creative class.

Unlike cultural norms, which are formed at the group level, personality traits are based on the individual, and where a city has a relatively larger proportion of particular types of personality present, this will affect innovation and growth. Using a cluster analysis approach, Jason Rentfrow and colleagues have identified three psychological profiles of regions – friendly and conventional, relaxed and creative, temperamental and uninhibited – covering the U.S. states. They find that in terms of economic prosperity a positive link exists with openness and extraversion, while conscientiousness displays a negative association.

5. Psycho-Cultural Behavior and Agency

Together, culture and personality psychology form the psycho-cultural behavior of a city. Emerging research I have undertaken with Piers Thompson and Martin Obschonka, suggests that it is the co-evolution of cultural and personality traits that may best explain the role of behavior on city-level growth, innovation, and entrepreneurship. As an example, Figure 5 shows that across cities and localities in the U.K., places portraying behavior that is both psychologically



extravert and culturally engaged in work and education tend to experience higher rates of GVA per Capita. Conversely, cities and localities with high rates of agreeable and socially cohesive behavior are generally less economically growth oriented (Figure 6).

In summary, culture and personality traits underlie the reasoning why individuals, or collectives of individuals, ultimately behave in particular ways, which, in the long-term, influence factors such as the development and growth of cities. In other words, macro-level outcomes are retraceable to individual decision-making agents, which suggests a link between the extent to which individual agents are motivated to achieve and the ensuing rates of development of the cities in which these individuals operate. In this sense, to be an agent is to intentionally make things happen by one's actions.

From the perspective of urban development it is necessary to identify the types of agent, agency, and action that are likely to achieve desired (or undesired) results and outcomes. A starting point is to consider three meta-forms of localized agency that clearly impact

Figure 5: Relationship between Extravert and Engaged Psycho-Cultural Behavior and GVA per Capita across Cities and Local Areas of the U.K.

Source: Huggins, R. and Thompson, P. (2016). "The Behavioural Foundations of Urban and Regional Development: Culture, Psychology and Agency"

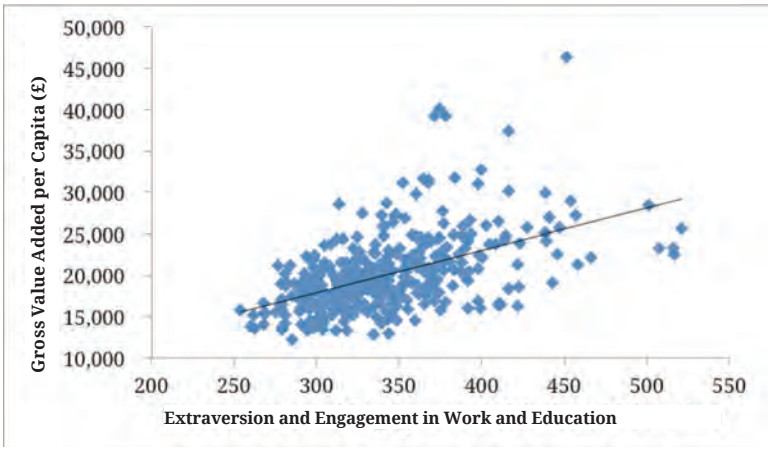
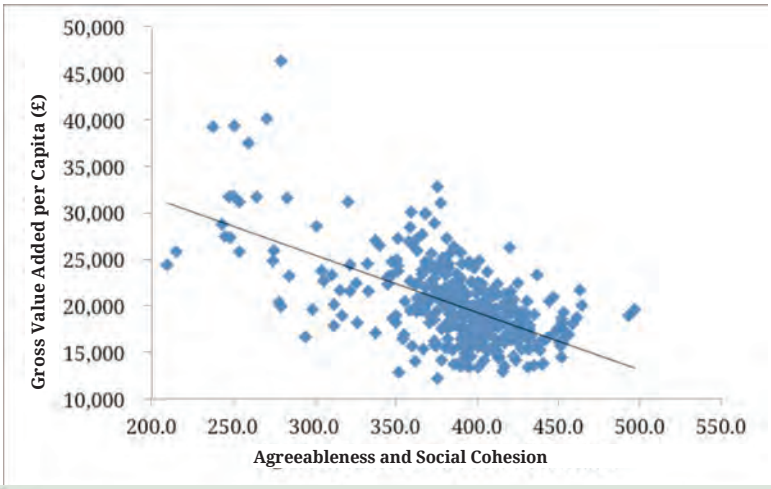


Figure 6: Relationship between Agreeable and Socially Cohesive Psycho-Cultural Behavior and GVA per Capita across Cities and Local Areas of the U.K.

Source: Huggins, R. and Thompson, P. (2016) "The Behavioural Foundations of Urban and Regional Development: Culture, Psychology and Agency"



on urban and development outcomes: entrepreneurial agency, political agency, and labor agency. Although all three will influence the growth and development of a city, entrepreneurial agency is likely to be most important in terms of innovation-led growth.

Entrepreneurs are increasingly depicted as agents of economic and social change that develop communities, often enacting a collective identity that facilitates and shapes development. Studies have repeatedly found that autonomy and independence, rather than pecuniary reasons, are cited as motivations for engaging in entrepreneurial activities. Furthermore, the opportunity to use the creative side of our personalities may also feature in motivations for business ownership.

However, while the creation of a new business is an accurate description of one of the many outcomes of entrepreneurial activity, entrepreneurship encompasses far more than business start-ups. It derives from the creative power of the human mind, and is characterized as a behavioral characteristic of individuals expressed through innovative attributes, flexibility, and adaptability to change.

Conclusion: So What Can Be Done?

The above suggests that a range of behavioral, institutional, and capital factors shape the capacity and capability of firms within cities to innovate. Institutions and capital form the city growth systems within which ventures operate and evolve, while the behavioral systems of cities will help shape the type and nature of entrepreneurs, as well as the ventures they establish and the forms of innovation they engage in. While institutions can be considered to be the rules of the game governing growth processes, cultural and psychological traits encompass the extent to which such rules are adhered to, as well as the way in which they foster future institutional change.

This meshing of theoretical approaches indicates that harnessing the determinants of innovation-led growth in a positive and constructive manner clearly involves significant challenges for city policymakers and other economic development stakeholders. Nevertheless, cities will continue to act as laboratories for entrepreneurship and innovation, and future policymaking would do well to recognize that increasing the stock of associated intangible capital alone may not produce significant increases in economic growth unless high-quality institutions are in place. Also, by identifying the connection between types of institutions and forms of "growth capital," it is possible to consider distinct varieties in the economic growth systems and models at play across cities.

VENTURES SHOULD BE ENCOURAGED TO SOURCE THE MOST RELEVANT KNOWLEDGE WHEREVER IT IS LOCATED

This suggests a number of recommendations for future policy that can be said to operate at the nexus of city innovation and entrepreneurship policymaking. In particular, city growth systems are likely to benefit from public intervention that stimulates network capital formation principally focused on network building and brokering, cluster development, innovation system development, cooperation, and mobility. Alongside this, intervention may also be required to bolster other parts of the growth system, especially access to human capital (e.g., business support and advice), financial capital (e.g., risk capital, loans, or subsidies), or physical capital (e.g., incubators, research, and technology centers).

In cities with lagging rates of innovation, entrepreneurial firms are likely to face barriers in accessing such knowledge, especially through networks within their own cities. In particular, if entrepreneurs within a city are unable to assimilate knowledge from their internal base with that accessible from other organizations, there is a potential role for intervention in the form of innovation policies that act as an "emulsifier," allowing different types of knowledge to be more effectively combined.

Ventures should also be further encouraged to source the most relevant knowledge

wherever it is located. For some years, urban and regional innovation policy has focused on the cluster model of development, which has led to there being little concern from policymakers with supporting more global connections. Policy initiatives, therefore, should widen their city and regional focus and embrace more spatially open and connected network systems.

The focus on knowledge capital as a key driver of innovation has meant that for many years the assertion of intellectual property has been seen as the key means by which firms are able to protect their knowledge. However, due to increasing problems of asserting rights in many sectors (e.g., services) and the cost and time implications of patenting and licensing agreements, this is not an option for all entrepreneurial and innovative firms, especially as larger firms are adopting open innovation strategies.

To an extent, the traditional intellectual property support available to firms is likely to become less relevant as open innovation and open sourcing become ever more prevalent business practices, and new policy initiatives are required to support new ventures in ensuring they are equitably treated when establishing networks and strategic alliances with more powerful and well-established firms.

Conversely, perhaps, to intervening in city growth systems, engineering psycho-cultural behavior is a more sensitive endeavor and is not something city policymakers can achieve overnight. In reality, a mix of policies seeking to influence both behavior and entrepreneurship are likely to be required to facilitate entrepreneurially driven economic development, with the need for each form of intervention to be mutually compatible. Without such compatibility, success is likely to be limited. Examples of some cities that are positively implementing some of this policy thinking over a number of years include Zurich (Switzerland), Munich (Germany), Vancouver (Canada) and Richmond (United States).

FURTHER RESOURCES

Huggins, R., & Thompson, P. (2016). Socio-spatial culture and entrepreneurship: Some theoretical and empirical observations. *Economic Geography*, 92 (3): 269–300.

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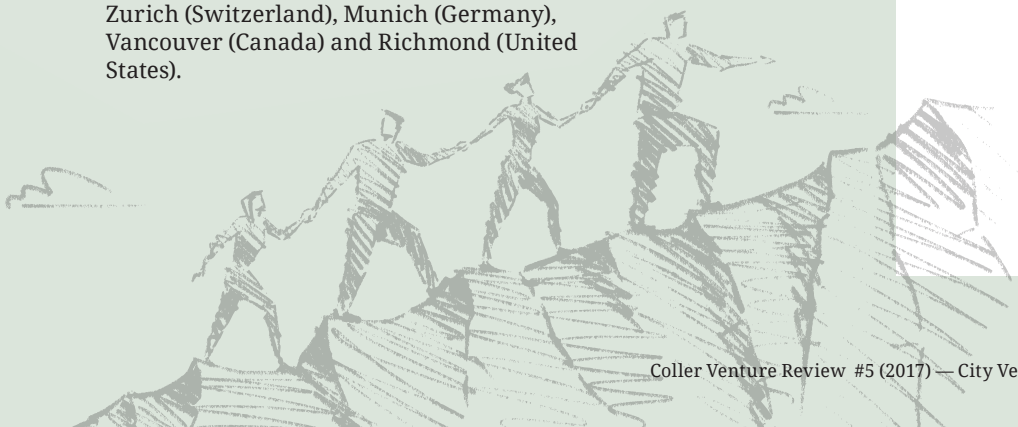


CIV CITY CASES
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I

In this issue we present eleven CIV City Cases, each devoted to a single city. These describe, in a standard format, the experience of each city in developing its venture ecosystem, with special attention to the strengths and weaknesses, key factors and institutions that affect the city's success. They conclude with lessons – both good and cautionary – that can inform other cities as they evolve their strategy.

The eleven CIV City Cases included were mostly written by authors residing in those cities, thereby trading objectivity for first-hand experience. The selection was determined by responses to our call for papers; we expect to extend it in future, and therefore invite submission of more cases. If you have intimate knowledge of the venture ecosystem story of your city, please contact us at CityCase@civ.global to discuss converting it into a new CIV City Case.

SHANGHAI, 1999–2016 THE ROAD TO VENTURE AND INNOVATION

civ.global/shanghai

Zhao Jinshi
Associate Professor, School of Finance and Business, Shanghai Normal University

Li Tingting
Master's degree candidate, School of Finance and Business, Shanghai Normal University

Cao Wenjing
Undergraduate, School of Finance and Business, Shanghai Normal University

Xue Lili
Master's degree candidate, School of Finance and Business, Shanghai Normal University

Inhabitants: 14.7 million (1999); 24 million (2016)

The Geographical Context

Shanghai is located in the Yangtze River delta economic center. Adjacent to several deep-water harbors, it has advantages in terms of superior location and convenient traffic. With well-developed connecting channels as the basis, Shanghai radiates all around, promoting links and collaboration among cities and accelerating economic development in surrounding areas.

Relationship with Government

Shanghai VC companies operate in accordance with the laws and regulations of the central government. The development of Shanghai VCs is extensively affected by both the central and local government. The government has implemented policies about the development of VCs and reduced the required investment threshold. For example:

- In 2006, the State Council implemented the outline of the National Program for Long- and Medium-Term Scientific and Technological Development, indicating that development of VCs should be promoted.
- In 2015, Shanghai's municipal government highlighted, in the Guidelines of Improving Technology and Finance Innovation, that developing technology start-ups would facilitate angel investment and venture capital actively.

For more on the Chinese VC market, see *Growing the Venture Dragon: China*, civ.global/vdra

Anchor Institutions

The following three venture capital firms have invested in Internet retailing, healthcare, information technology, and clean technology, among others. All of them have a large influence over Shanghai's VC industry because of their distinguished investment strategy and lucrative profits. Most of the companies they have invested in are located in Shanghai.

- Shanghai Venture Capital Co., Ltd., established in 1999, is a state-owned VC of US$1.7 billion which has invested in more than 160 start-ups. The purpose of the company is not only to accelerate the transformation of hi-tech achievements but also to enhance the level of traditional industries.
- Qiming Venture Capital, founded in Shanghai in 2006, manages US$2.7 billion through five U.S. dollar funds and four CNY (Chinese Yuan) funds. Qiming has invested in 160 innovative companies across China. More than 30 of these companies have influential brands such as Hexing Electrical Co. Ltd, listed on the Shanghai Stock Exchange, and Jiayuan.com International Ltd., listed on NASDAQ.
- Shanghai Jiaotong University Venture Investment Limited, established in 2000 by Shanghai Jiaotong University and local government. The university introduced the concept of venture capital at the early stage in Shanghai and uses this VC firm to contribute and practice its theory of VC. The fund focuses on hi-tech projects in Shanghai Jiaotong University Science and Technology Park and Shanghai science and technology intensive areas.

Venture Statistics

From 2001 to 2016, the number of tech investments in Shanghai totaled 4,044; 3,188 new VCs were established, and total investments reached more than US$32.2 billion (at the USD/ CNY exchange rate of October 2016).

Strengths

Venture capitals in Shanghai benefit from a mature financial environment where different kinds of intermediaries such as accounting firms, law firms, bonding companies, and evaluation organizations are well developed. Shanghai has been making efforts to become an entrepreneurial city and a hub of innovation through its huge supply of skilled labor (4.76 million in 2016), low taxation, a growing consumer market, and attractive investment policies that will maximize the strengths of the parties concerned, encouraging large numbers of people from surrounding cities to move to Shanghai and start businesses. These conditions have not only given a strong boost to Shanghai's economic development but have also created favorable conditions for VCs to seek opportunities in Shanghai.

Weaknesses

- Innovative activities grow sluggishly in Shanghai due to the restrictions of the central government. Some advanced innovations will be banned because they introduce uncertainty into China, which is considered to affect the current regime and interest groups.
- Additionally, VCs face a challenging situation as IPOs have been suspended several times in China, which has had a substantial negative influence on private VCs which don't have a comprehensive exit mechanism.

Ecosystem Players

- Hi-tech start-ups
- VC institutions
- Local government
- Shanghai equity trading center
- The intermediaries

Strategies Employed

The strategies employed by Shanghai are to learn from entrepreneurial cities such as Shenzhen, and as long as these cities' innovative activities obtain the central government's permission, similar innovation activities will be actively promoted by the Shanghai government. In this way, the risk and uncertainty of government policy will be reduced, as well as the cost of innovation.

Results

As a result of the strategies employed, VCs in Shanghai have developed rapidly in recent years, promoting the development of start-ups in this city. Between 2001 and 2016, the number of newly founded companies grew by 15 percent, investment events grew by 20%, while the investment fund increased by 128.21%.

Lessons and Conclusions

- Nowadays, state-owned VCs have no crowding-out effect on private VCs. The way state-owned VCs work has undergone a complete transformation in recent years, and many start-ups have gained considerably from the positive policies.
- Considering the restrictions placed by the central government, the follow-up strategy employed by Shanghai would be a good one to emulate by other cities that prefer not to take risks. Not only would it reduce the risk and uncertainty of central government policy, but it would also cut the cost of innovation for those cities.

TURIN, 2000–2016
THE BLOOMING OF AN ENTREPRENEURIAL ECOSYSTEM

civ.global/torino

Federico Caviggioli
Assistant Professor, Politecnico di Torino

Elisa Ughetto
Associate Professor, Politecnico di Torino

Inhabitants: 910,000 (2000); 891,000 (2016)

The Geographical Context

Turin is the administrative, industrial, and commercial capital of the Piedmont Region of Italy. The geographical location is propitious: it is a landmark on the Mediterranean corridor of the Trans-European Transport Network and less than one hour by high speed train from Milan. It is the core of the regional network of technological clusters and scientific parks that have been promoted by the regional government with the funding support of the European Union (EU).

Relationship with Government

- Turin's entrepreneurial ecosystem emerged in the early 2000s after the First Strategic Plan was signed. The plan was developed following a systemic and participative approach involving local public actors such as the City of Turin, the Piedmont Region, Turin's Chamber of Commerce, and Politecnico di Torino (a leading public university in technical/scientific research). While the first phase of the Strategic Plan was devoted to urban requalification, the second phase was aimed at spurring a process of cultural and industrial renewal.
- Today, important actions to promote entrepreneurship and to support the local economy are taken by the regional government through its financial company Finpiemonte SpA. Città Metropolitana, the institution governing the metropolitan area, is responsible for urban planning while the Chamber of Commerce provides supportive services to new ventures. Such governmental institutions are well connected within the ecosystem's network.

Anchor Institutions

- With the launch of the Strategic Plan in 2000, an ecosystem of multiple actors (institutional, industrial, and cultural) defined a concerted strategy to guide the transformation of Turin into an innovative and attractive city.
- Turin's first incubator, I3P, played the role of anchor organization in this process. Founded as a non-profit consortium constituted by Politecnico di Torino, the City of Turin, the Chamber of Commerce, and Turin's Province, it acted as a catalyst, which was pivotal to the transformation of the local economy and the spawning of entrepreneurship.

Venture Statistics

- Turin is one of the most entrepreneurial and innovative cities in Italy, counting 300 innovative start-ups between 2012 and 2016 out of a total of 6,433 in Italy. In 2015, Turin ranked fourth among the Italian provinces, after Rome, Milan, and Naples, in terms of new firms created and third, after Milan and Rome, in terms of innovative start-ups.
- Turin is second, after Milan, in terms of total patent applications to the European Patent Office (EPO) (195 new filings in 2012, Eurostat).

Strengths

- The city's industrial system. Originally centered around the FIAT automaker, the industrial setting of the city has progressively evolved toward a multi-firm system of emerging businesses, today only partially linked to local automotive production.
- The cultural side of the city represents today an important element of its economic renewal. Following many initiatives originated by the main players involved in the Strategic Plan, Turin became one of the top 10 Italian cities for international tourism (2007–2012).

Weaknesses

- Reluctance of the industrial system to allow a cultural entrepreneurial change and to abandon the traditional innovation models based on the centralization of competences and resources. The entrepreneurial ecosystem is also not sufficiently open and attractive for external players.
- Access to finance: 21 percent of local innovative firms report having been denied bank credit and 71% rely exclusively on internal financial resources. The financial system lies on the margin of the ecosystem and venture capital funds are still negligible sources of financing for new ventures, which are often forced to relocate abroad.
- Only few institutions, without a clear position in the ecosystem, focus on the later stages of ventures' life cycles. It follows that limited actions are taken to sustain the successful exploitation and commercialization of ventures' innovative ideas and products.

Ecosystem Players

- Governmental institutions: the City of Turin, the Piedmont Region, the Chamber of Commerce, Città Metropolitana and Finpiemonte.
- Local universities: Politecnico di Torino and Università degli Studi di Torino, with their incubators, I3P and 2i3T.
- Other institutions in the field of education and research: Fondazione Human+, Istituto Superiore Mario Boella, Istituto Europeo Design.
- Players supporting entrepreneurship: associations, community, and co-working institutions (e.g., Talent Garden Torino, Toolbox, Top-Ix, YES4TO), business and innovation centers, accelerators, and science parks (42 Accelerator, Bioindustry Park, Sella Lab, Environment Park, CSP, Fondazione Torino Wireless, Social Fare), and trade associations (e.g., API, Ascom, CNA).
- Financial investors (venture capital funds, business angels, banks): Unicredit, Intesa Sanpaolo, Innogest, Club degli Investitori, Euroventures.

Strategies Employed

Turin's ecosystem has promoted actions aimed at stimulating innovation (through the creation of technological clusters [e.g., Innovation Poles], science parks, and business incubators) or at developing education and traineeship for entrepreneurs. New programs to channel financial resources to start-ups have also been promoted by banks (e.g., Unicredit, Intesa Sanpaolo) and business angel networks (Club degli Investitori).

Results

- In 2000, an ecosystem of multiple actors (institutional, industrial, and cultural) converged on the Strategic Plan to guide the transformation of Turin from a manufacturing into an innovative and attractive city. Several players joined along the way and created a dense network of institutions working to stimulate the birth of entrepreneurial activities.
- Turin is now a fertile ground for a large number of start-ups (5% of the national total) and patenting activities are rising.
- The network of actors is particularly concentrated in supporting the early phases of start-ups' life cycle, currently disregarding the later stages.
- Industrial and financial actors are still largely missing in the ecosystem, although important investments have been started by keystone players (Centro Ricerche Fiat, General Motors, Avio, and Intesa Sanpaolo).

Lessons and Conclusions

Generalizing from the case of Turin, a city should:

- promote the collaboration and involvement of several institutional, industrial, and cultural actors around a common vision in order to create a supportive ground for innovative ventures;
- involve players actively supporting the entire life cycle needs of new ventures;
- actively mobilize financial capital by attracting private equity and informal risk capital;
- implement actions to overcome path dependencies affecting institutions in order to spur them to reshape their role.

DÜSSELDORF, 2010–2016
REDEFINING LOCAL COMPETITIVENESS

civ.global/ddorf

Monika Hauck
Doctoral Researcher, WHU – Otto Beisheim School of Management

Arjan Tupan
Board Member, StartupDorf / Independent Consultant

Inhabitants: 588,000 (2010); 628,000 (2015)

The Geographical Context

Düsseldorf is the capital of the German federal state North Rhine-Westphalia, which for centuries has been a center of economic activity. It is located in the heart of the most populous and economically active German state, and is very well connected to the rest of Germany and the world via road, water (the river Rhine), and air. It is claimed by the city that 31 percent of the European Union (EU) population lives within a 500 km radius of the city and that 50% of EU purchasing power is generated there.

Relationship with Government

The government of Düsseldorf has a long history of supporting economic activity. In 2001, the Go-DUS or the Gründungsnetzwerk (founding network) was established and has been vital in supporting newly founded companies. However, venture-backed, digital start-ups did not feel supported or understood by this network.

Under Mayor Thomas Geisel, elected in 2014, the focus of the city expanded to the start-up scene, which focuses on new businesses that are digital, employ new business models, and are often backed by venture capital due to their need for fast scalability. The mayor set a goal for Düsseldorf to become an international start-up metropolis and placed start-up support at the top of his political agenda.

Anchor Institutions

- Heinrich Heine University Düsseldorf is well-known in the field of natural sciences and has been vital to Germany's biotechnology industry. Together with the Life Science Centre, it supports start-ups and established companies by offering laboratory and office space and business counselling.
- One of the largest and best-known travel sites in Europe, Trivago, was founded in Düsseldorf in 2005 and has been a pioneer and a standard bearer on the digital start-up scene.

Venture Statistics

Today, the city has the highest per capita number of new business registrations in Germany (430 per 100,000 inhabitants in 2015). However, the focus and success of Düsseldorf companies have mainly been in traditional businesses and sectors.

Strengths

The city:

- Is located in Europe's most populous region;
- Has a diversified and expansive corporate landscape and hosts the headquarters of major national and international corporations;
- Has the second highest purchasing power index in Germany;
- Offers relatively low rents and high availability of office and industrial spaces;
- Is an attractive university location with 22 universities and academies, and the WHU – Otto Beisheim School of Management MBA campus since 2012;
- In 2015 was ranked sixth on the Mercer City Ranking List which compares quality of life worldwide.

Weaknesses

- Düsseldorf retains a conservative image that is less appealing to young talent.
- Relative economic prosperity has led to complacency with regard to innovation in the economic development of the city.
- The city does not have a leading technology university, which creates a gap in the talent pool.

Ecosystem Players

- Initially, the start-up ecosystem was started by rebellious grassroots movements. A key role was played by the first co-working space in Düsseldorf, GarageBilk, founded in 2010. This rapidly became a place where start-ups and creatives met, worked, and grew their community.
- In 2012, the first start-up incubator, 1stMover, was founded and focused on mobile solutions; it also connected established corporations to the innovative start-ups.
- StartupDorf, the local start-up association founded in 2013, also became an important driver in fostering and building a start-up-minded community in the city.
- Two corporations headquartered in Düsseldorf have played an important role: E.ON launched an accelerator called :agile in 2013, and Metro Group initiated regular Innovation in Retail meetups. These activities have inspired other Düsseldorf-based corporations to extend their venture-related activities into their backyard as well.

Strategies Employed

- The Startup Initiative task force, initiated by the city, engaged more than 100 actors, ranging from start-ups to established multinationals, and from grassroots movements to academic institutions in a series of workshops. This helped the city to develop a start-up strategy of matching the needs and desires of its existing actors, and playing on the strengths and filling in the gaps of the local ecosystem.
- A Startup Unit was established within the Economic Development Department of the city at the end of 2015, specifically aimed at interacting with start-ups and the surrounding ecosystem.
- In spring 2016, the first major joint activity of the city and the existing ecosystem was the organization of the inaugural "Startup Week Düsseldorf," which included around 40 events and attracted more than 2,600 participants.
- When the state of Nordrhein-Westphalia announced it would award five locations the title of Digital Hub, with the promise of significant investment attached, the city once again showed its strength by convincing ecosystem players and established corporations to join forces. Düsseldorf successfully applied and now has that Digital Hub status.
- In summary, the strategy of the city of Düsseldorf was to first identify local strengths and weaknesses, connect relevant players and, finally, support independent efforts and raise awareness.

Results

It turns out that city involvement was a great addition to the local ecosystem. First, events where local founders can network, learn, compete, and strengthen ties have increased significantly. Second, it brought in another active co-working space, Startplatz, with its Rheinland Pitch contest and its grand finale with more than 800 participants. This also proved the need for space, confirmed by the massive expansion of co-working spaces like the GarageBilk move into Factory Campus and Gewächshaus Düsseldorf into Super7000. Finally, the active involvement of the mayor himself and the ensuing increased media attention started a kind of social movement, which manifested in the mobilization of people and a cultural change.

Lessons and Conclusions

Düsseldorf offers an interesting case study of a wealthy region taking an active role to adapt to the changing environment. It showed that with a clear strategy and open attitude to listen and learn, the city government could indeed give positive impetus and foster change.

What other cities can learn from Düsseldorf is not to simply copy other places, but rather to focus on their own strengths and weaknesses and learn from their own experiences. By building on local strengths, such as the presence of many large domestic and international corporations and a high degree of entrepreneurial spirit, Düsseldorf is building a strong ecosystem with a focus on strengthening and expanding existing industries.

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BERLIN, 2010–2016
HOW BERLIN ROSE TO BECOME EUROPE'S START-UP HUB

civ.global/berlin

Maxi Knust
Founder of Fempreneur and Co-Publisher of Female Founders Book

Inhabitants: 3.46 million (2010); 3.65 million (2016)

The Geographical Context

- Central & booming: Berlin serves as a gateway that connects Eastern and Western Europe. Between 2012 and 2014 a total of 135,000 newly registered "Berliners" settled in the city.
- Recruiting talents more easily: As a member of the European Union (EU), Germany, and especially the start-up ecosystem of Berlin, benefits from access to Europe's highly educated talent pool.

Relationship with Government

- Grants program by the federal government: To improve the entrepreneurial environment at universities and research institutes, the German Federal Ministry for Economic Affairs and Energy (BMWi) developed the EXIST start-up grants program.
- Start-ups expect a better understanding of specific needs: Only 5.5 percent of German founders attribute good start-up understanding to policy makers. Every fifth start-up expects politicians to reduce regulatory and bureaucratic hurdles, followed by tax reductions and assistance in raising capital.

Anchor Institutions

- Universities with entrepreneurship programs: Technical University of Berlin, Free University of Berlin, Humboldt University of Berlin.
- Established companies: Siemens, Mercedes-Benz, Amazon, Fujitsu, Google, and Microsoft have subsidiaries in Berlin, between them employing 25,000 people.
- Accelerators and incubators: Team Europe, MCube Incubator, Project A Ventures, Rocket Internet, Rheingau Founders, YouIsNow – incubator by Scout24 Portals, Hubraum – incubator and accelerator by Deutsche Telekom, Metro Accelerator powered by Techstars.
- Start-up campus: Since its opening in 2014, Factory Berlin has brought together such innovative start-ups and mature tech companies as 6Wunderkinder, Soundcloud, Twitter, UBER, and Zendesk. These companies cooperate as business incubators for other new ventures, a model that Factory Berlin calls "organic acceleration."

Venture Statistics

- Growing number of start-ups and jobs: In the space of four years, start-ups in Berlin have tripled, from 270 start-ups in 2012 to 620 start-ups at the beginning of 2016. The number of employees increased from 6,700 in 2012 to 13,200 in 2016. Berlin-based start-ups were the fifth-largest employer in the city.
- Number one in venture capital investments: In 2015, Berlin start-ups raised around €2.145 billion in venture capital and, subsequently, Berlin became number one in Europe in venture capital investments.
- Becoming a major global player: Berlin moved from position #15 to position #9 on the start-up ecosystem index in the Global Startup Ecosystem Report 2015, and was rated as the ecosystem with the highest growth index.
- Start-up scene brings strong economic growth to Berlin: In 2014, the GDP of Germany's capital increased by 4.4% compared with 2013, while Germany's GDP grew by only 1.7%.

Strengths

- Berlin is a melting pot: Berlin is diverse, with people from more than 180 countries, with around 15% not holding German citizenship. Most people in the start-up scene speak English.
- Creativity: A strong creative scene has

resulted in a soaring inflow of national and international tech talent.

- Berlin is affordable: Though rents have increased in the last few years, life is still well affordable compared to other global venture hotspots. In addition, highly qualified talent can be recruited for quite low wages, thus making it easier to set up a start-up team.
- Berlin is attractive to founders: "Startup Heatmap Europe" named Berlin as top city when founders were asked where they would start up if they could begin all over again.

Weaknesses

- Rigid regulatory investment environment: Experts argue that the rigid regulatory investment environment, as well as a weak local exit market, are curbing Berlin's growth. As a consequence, it remains a challenge to raise late-stage funding in Berlin.
- Bureaucracy: The length of time it takes to process documents due to understaffed public institutions in Berlin and bureaucratic hurdles are seen by founders as obstacles that should be reduced in order to promote start-up growth.

Ecosystem Players

- Rocket Internet: The largest incubator in Berlin, which was founded in 2007 and had a €6.5 billion initial public offering in October 2014, one of the largest in Europe. In 2016, Rocket Internet was valued at €6 billion. Start-ups such as Zalando and HelloFresh have emerged successfully from the incubator.
- Holtzbrinck Ventures: One of the most active and oldest German VCs, it has supported more than 100 companies, such as Delivery Hero, Groupon, and Audible. The VC is also one of the regular investors in Rocket Internet and, in the run to Rocket's IPO in 2014, it became a direct shareholder.
- Delivery Hero: In 2015, the top VC-financed start-up in Germany (€586 million) was the Berlin-based start-up Delivery Hero.

Strategies Employed

- Increased opportunities to network: Events which help entrepreneurs to connect and network, such as Tech Open Air, Noah, Heureka, Startup Safari, as well as a variety of meetups, are hosted in Berlin.
- Connecting research and city development: In 2016 the Berlin senate signed an agreement with Fraunhofer Institute for founding the Digital Networking Center of Excellence, where research will be performed on solutions to a variety of practical problems relevant to the City.
- Large funding for early-stage and growth start-ups: In 2015, Holtzbrinck Ventures launched its sixth and largest fund with €285 million and invests between €500,000 and €40 million per company.

Results

- Highest start-up rate in Germany: 121 new businesses were founded per 10,000 residents in Berlin in 2013 (average in Germany: 76).
- Highest self-employment rate: Berlin also has the highest percentage of self-employed people in Germany with 13.6 % in 2013 (average in Germany: 10.7%).
- Berlin is the leading state in IT start-ups: Two-thirds of the invested capital went to start-ups in the information and communications industry, with a focus on Internet and mobile services, software, and e-commerce.

Lessons and Conclusions

- More political support is needed: Though Berlin politicians promoted the start-up scene throughout 2015, making several visits to Tel Aviv and New York City in order to strengthen ties of cooperation, the start-up ecosystem still needs more support by government and policy makers. An organization that is actively supported by the Senate of Berlin to push through initiatives, to define targets for the different parties involved, and to ensure that targets are actually met, is essential for further growth.
- Berlin's venture ecosystems are maturing: Successful IPOs and exits have helped to build the confidence of investors that Berlin's start-up ecosystem is gaining in maturity and the balance between ideas and capital is falling into place. The growing interest of Germany's established corporations in the start-up scene and the influx of venture capital are an indicator that Berlin's boom is not just temporary.

TEL AVIV, 2010–2016
THE START-UP CITY OF THE START-UP NATION

civ.global/tlv

Hila Oren
CEO, Tel Aviv Foundation

Inhabitants: 404,300 (2010); 422,000 (2014)

The Geographical Context

Tel Aviv is at the heart of the Greater Tel Aviv area, the center of mass of financial, cultural, and business activity within Israel. The city supports the smaller cities that surround it – which themselves contain start-ups and related institutions – and is an epicenter for more distant cities, from Nazareth in the north to Beer Sheba in the south.

Israel itself, the "Start-up Nation," is an island of innovation: its geopolitical reality means that any trip to another country requires air travel. And Tel Aviv is the gateway to this island, with proximity to the main international airport, access to capital, and many venture accelerators.

Relationship with Government

This is an ongoing relationship, with constant bilateral feedback and collaboration. The Israeli government is well known for its efforts to support venture, and its programs – such as YOZMA (1993), which offered attractive tax incentives and investment matching – were the basis on which Tel Aviv's growth was founded; The municipality came on board later, around 2010, when it understood that start-ups were its unique selling point, and started investing in the urban venture ecosystem.

A key factor is the existence of countless partnerships between the public and private sectors, which drive the ecosystem's evolution.

Anchor Institutions

- Tel Aviv University, the country's largest, with more than 30,000 students. In addition to creating knowledge leading to new ventures, the university is home to StarTAU, the university's Entrepreneurship Center, providing entrepreneurs and students of entrepreneurship with the practical and professional guidance they need to start a successful business venture.
- Afeka college and Tel Aviv-Jaffa Academic College, both playing active roles in promoting the teaching and incubation of innovation.
- The Office of the Chief Scientist in Israel's Ministry of Economy and Industry is active in supporting the venture ecosystem, for example through its "Invest in Israel" initiative which facilitates foreign direct investment.
- Startup Nation Central, a non-profit which connects companies and countries to the people and technologies in Israel that can solve their challenges. It maintains a comprehensive database which provides data and connectivity to more than 4,500 Israeli companies across dozens of industries, and acts to connect these companies to potential clients and investors and to grow the ecosystem as a whole.

Venture Statistics

- Tel Aviv has 1,450 start-up companies (out of 2,800 in the greater Tel Aviv area), equaling one start-up per 290 residents – the highest per capita figure in the world (2016 data).
- Annual hi-tech exit transactions: US$4.605 billion in 2015.
- 84 Accelerators, co-working spaces, and innovation centers.
- More than 100 tech-related meetups every month.

Strengths

- Human capital – a large presence of talented young people, many trained in the Israel Defense Force's technological units.

- The Israeli cultural characteristics of "*chutzpah*," risk taking, and improvisation.
- Tel Aviv's connectivity with other cities across the country.
- A government policy encouraging start-ups.
- The "non-stop city" milieu, which is attractive to creative young people.

Weaknesses

- Small size of the country, market, population, and ecosystem.
- Limited available capital compared to the metropolises of other countries.
- The relative weakness of Israelis in marketing and product design.
- Government policy of not issuing visas for start-up talent from outside the country.

Ecosystem Players

- Tel Aviv Global, a city-owned company with the mission to promote the innovation (or start-up) ecosystem in Tel Aviv.
- IATI – the Israel Advanced Technology Industries organization.
- DLD (Digital Life Design) Innovation annual events.
- Atidim Ltd., a Beta Site for Smart Cities innovation.
- Innovation hubs – SOSA, WeWork, and many more.

Strategies Employed

- The Tel Aviv Municipality has integrated the innovation agenda into its own organization by setting up an innovation program within the municipality itself which provides training to city employees.
- In 2011, the municipality created a meeting place for the innovation ecosystem. Named The Library, it offers co-working office facilities, hosts networking events, and provides professional infrastructure for young technological visionaries.
- Tel Aviv has deployed free WiFi access across the entire city.
- There are special reduced city taxes for start-ups, notably a 50 percent tax discount for software firms.
- The city's data are made available to developers in app development competitions. This includes all GIS data layers related to city planning – roads, schools, lighting, and many more (personal data, of course, are not shared). Also available are real-time traffic data, which are shared with navigation app companies, allowing them to improve the apps for the benefit of the city's drivers.

Results

Recent years have shown exuberant growth:

- Annual hi-tech exit transactions rose from US$550 million to US$4.6 billion between 2012 and 2015.
- The number of accelerators, co-working spaces and innovation centers rose 58% between 2014 and 2016.
- In 2015-2016, Tel Aviv received unprecedented exposure from the worldwide hi-tech industry, other city governments, and academia, and is seeing a veritable pilgrimage of people eager to learn and emulate the ecosystem. Tel Aviv was an early success, and now many cities worldwide are catching up.

Lessons and Conclusions

- Local culture and image plays a crucial role. A municipality needs to provide an environment that will entice young entrepreneurs to locate their ventures to the city because it is the kind of place they want to live in, thus creating a growing momentum for even more people to ride this wave.
- The city government must understand what the citizens need, remove obstacles, and facilitate growth of the ecosystem.
- Adopt a collaborative attitude, involving the public and private sectors.
- Openness to the world is key – the city government must make becoming a global city, and being perceived as one, a top priority.

NEWS IN BRIEF

POLICY

HISTORY OF VENTURE

DEEP INNOVATION

UNIVERSITY VENTURE

CITY VENTURE

FINANCIAL MODELS

CIV NEWS

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The US VC Market Stalls Facing Uncertainty Due to Coming Elections

大选在即，不确定性侵袭美国风投市场

While the outcome of the U.S. presidential elections, to be held on November 8, is still unknown, it is clear that the U.S. markets respond badly to such states of uncertainty. Even when the election favorite appears to be quite clear, in today's media climate everything can change in mere minutes.

For markets seeking continuity, the departure of a two-term president creates a problem. According to a report by Merrill Lynch, the S&P-500 index has dropped an average of 2.8 percent in presidential election years that did not include a sitting president seeking reelection. In the years when a president sought reelection, the S&P-500 averaged returns of 12.6%.

Indeed, the U.S. markets have experienced a decline in total deals...

PUBLISHED
30 OCTOBER 2016

How Can Smart Capital Stimulate Ideas?

"智慧投资人"如何能够激发创意？

Ideas are very important in the process of innovation, but they would usually come to nothing without proper funding. Prof. Jörg Rocholl, president of ESMT Berlin, states: "Most of these ideas need a lot of capital… that needs to be raised in order to test trial phases, for example, and in order to do the marketing and the launching of the products." ESMT Berlin, a leading German business school, is well-known for its connections with industry and VC funds, and operates the German Tech Entrepreneurship Center under its auspices. CIV will host its Research Award Ceremony and Cocktail in ESMT Berlin on Friday, September 16, 2016.

However, do the investors really know how to estimate the potential of presented ideas? According...

PUBLISHED
12 SEPTEMBER 2016

London's Start-Ups Seek Relocation to Berlin Following Brexit

英国脱欧，伦敦初创企业试图迁往柏林

London's start-ups have already made inquiries about moving to Berlin since the Brexit referendum, stated Berlin Partner, a German business development group.

"The most concrete inquiries are coming from London financial technology firms, which are considering a move to Berlin so as not to lose access to the European single market," said Stefan Franzke, Berlin Partner director, at a news conference on Monday.

Over the course of the past week, Berlin's senate has approached hundreds of London-based businesses to persuade them to switch their operations to Berlin. Unless they do so, warned the letter received... by these companies, they will lose the money from the European Investment Fund once Britain leaves...

PUBLISHED
18 JULY 2016

Chinese VCs Have Switched to RMB – How Does That Affect Their Performance?

中国风投基金转向人民币——这将如何影响风投基金表现？

China's VC industry has funds that are denominated in RMB as well as USD-denominated funds. The difference between RMB and USD is not only one of currency exposure – the currency denomination of Chinese VC funds has significant implications on how the VC fund is managed.

This editorial maps the rise of RMB-denominated funds, and outlines the differences between RMB and USD funds. In its second part, I will identify avenues for regulatory form to improve the governance of RMB-denominated funds.

It is important that Chinese regulators get this right: if China's RMB funds are to act as a source of "smart money" for its burgeoning hi-tech sector, as VC funds do in Silicon Valley, they need...

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09 JULY 2016

NZVIF Stops Investing Taxpayers' Money: Mission Accomplished or Incomplete?

新西兰创业投资基金停止用纳税人的钱投资：任务已经完成还是尚未结束？

NZVIF, a New Zealand government fund-of-funds, announced a transition to a "self-sustaining commercial model" after 14 years of investing taxpayers' money in venture capital. Established in 2002 by the NZ government, NZVIF has so far invested $162 million in 213 companies through privately run venture funds. NZVIF was never likely to make a profit, as its investment terms in private funds were deliberately favorable for the private investors. Thus, with a return on investment of a mere $0.93 to the dollar, it was losing taxpayers' money. Richard Dellabarca, a former investment banker, has been appointed as the new executive director for the fund-of-funds, aiming to take it into the...

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The World's First Computer Start-Up

全球首家计算机初创企业

Konrad Zuse (1910–1995) was a young civil engineer in 1935 when he decided to develop his Z1 computing machine. This consisted of 30,000 flat sheet metal parts cut by hand. Everything was mechanical: the memory, the processor… an entire computer made from a ton (literally) of interlocking metal parts. Check out this animation to get the idea.

And what a computer it was! The Z1 used Boolean logic and binary floating point numbers. Today, every computer does, but in 1938 it was unheard of. Its successor, the Z3 (1941), was the first programmable, Turing-complete automatic computer. And although these machines did not store program instructions in memory, Zuse also anticipated the stored program concept in two patent applications...

PUBLISHED
26 OCTOBER 2016

A Key Management Lesson From the 19th Century

来自十九世纪关于公司管理的重要一课

A letter was sent in 1843 by Ada Lovelace to the inventor Charles Babbage. Babbage had been working for years on his vision of a mechanical programmable computer, the "Analytical Engine." He was also driving the project into the ground by exceeding budget and time estimates, quarrelling with his chief engineer, and irritating the government whose funding he sought. A genius he may have been, but he had terrible management skills.

Ada Lovelace, then 27, had been assisting the 51-year-old Babbage for some years, but was despairing because of the setbacks to the project. Having excellent PR skills, she wanted to save the project by taking on the management and external relations and putting Babbage to work as what we'd call today a CTO...

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31 MAY 2016

Understanding the Past to Invent the Future

理解历史，创造未来

In a speech at a commencement ceremony in 2005, which has since become a classic, Steve Jobs told the graduates of Stanford University about the feeling he had when he was fired from Apple. “I felt that I had let the previous generation of entrepreneurs down,” he said. “That I had dropped the baton as it was being passed to me.” Jobs considered himself a relay runner in a chain, picking up the symbolic baton of innovation from David Packard and Robert Noyce. Noyce, a co-founder of Fairchild Semiconductor, one of the first technologic start-ups in San Jose, established Intel after leaving Fairchild in the late 1960s, while his former co-workers created Intel’s competitors, National and AMD.

In his recent monograph on the history of Silicon Valley, Leslie...

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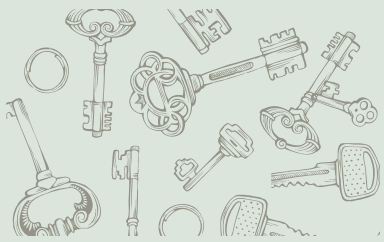
26 MAY 2016

History of Venture Database Visualization

风投历史数据库可视化

The Coller Institute of Venture at Tel Aviv University launched a project aiming to make its History of Venture database accessible to the public in an interactive online visualization. The database in question explores key events in the history of innovation and venture in the past 100 years (1914 to 2014). It is a valuable research tool for the study of the venture ecosystem, but its current presentation is limited to a text-based format suited to the academic researcher. We intend to deploy later this year an interactive application that will make it inviting and enlightening to the public at large by allowing web users to visualize and navigate the contents of the database in an informative...



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04 MAY 2016

CIV’s History of Venture Timeline at CIV2015HK

科勒风投研究院风历史数据库大事年表将在研究 2015年会发放

The Coller Institute of Venture History of Venture (CIVHOV) database is at the core of the institute’s History research strand (other strands being Deep Innovation, University Venture, and Policy), which is led by Prof. Eli Talmor. Arguably, it is the first effort in venture research that aims to build and maintain a database of key related events. The study of history in itself is valuable in any domain, if only because of the adage, “Those who fail to learn from history are doomed to repeat it.” Certainly in an evolving field like venture, history can provide ideas, lessons, and caveats. Prof. Eli Talmor’s article, Key Insights from a Century of Venture, published in the History Issue of...

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The Venture Ecosystem — Global, Messy and Fast

创业生态系统——全球化、凌乱化、快速化

It took Intel, established in 1968, 27 years to reach a value of $150 billion; Oracle (1977) reached it in 14 years; Google (1998) needed only three years; while Facebook (2004) made it in a mere 18 months. Nowadays, new start-ups are funded with tens of millions after 6 months of existence, and Unicorns like Viber ($900 million), Oculus VR ($2bn.) and WhatsApp ($19bn.) are acquired faster than ever.

However, while major VCs are more willing than ever to invest large sums in new ideas, founders often prefer using other, competing sources of funding, leaving VCs with second-tier investments and lower potential returns. In addition, the competition is no longer bound by location, and entrepreneurs can move quickly to find the best place for their...

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05 DECEMBER 2016

CIMIT – Crossing the Chasm from Academia to Medical Innovation

医学与创新技术融合中心(CIMIT)——连接学术界与医学创新的鸿沟

The healthcare field is facing major crises, including the aging of the population, the need to increase access for all to the best standard of care, and societal imperatives to contain healthcare-related costs. Unfortunately, there are many challenges to innovation in this domain, where researchers tend to work in siloed laboratories, without the entrepreneurial acumen and collaborative paradigms needed to implement their ideas.

CIMIT, the Consortia for Improving Medicine with Innovation and Technology, is a Boston-based co-operative of universities and hospitals founded in 1998 by the Massachusetts General Hospital, Brigham and Women's Hospital, MIT, and the Draper Laboratories, with a mission to improve patient care...

CIMIT®
Center for Integration of Medicine & Innovative Technology

PUBLISHED
10 OCTOBER 2016

VCs or Angels – Who's More Important for New Ventures?

风险投资和天使投资——孰对新的创业公司更重要?

An angel investor is an experienced person willing to invest in early-stage businesses, whereas a venture capitalist is a company or business rather than an individual.

So who invests more, angels or VCs? Prof. Sophie Manigart of the Vlerick Business School in Belgium explains: "It depends on what you're talking about; if you're talking money wise, then obviously venture capital investors have deep pockets and they invest more money. If you're talking about interaction and time, then business angels are also extremely important. They work very closely with the ventures that they invest in."

Prof. Manigart spoke at the Deep Innovation workshop held by CIV in 2014. In her interview, she said that venture capitalists were needed to support deep innovation...

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04 OCTOBER 2016

Are Mistakes an Inseparable Part of Innovation?

错误是创新不可分割的一部分吗?

"When you create something in an area where people haven't headed before, you get a lot of freedom, certainly freedom to innovate, and also freedom to make mistakes," says John Porter, chairman of SinoCare Group, China. According to him, new ideas and start-ups are tricky in the sense that they mean exploring new territories – places that no person has gone before – and therefore it is not unusual to encounter many obstacles. In retrospect, these obstacles and bumps may seem like a very natural part of a progression. However, in the early stages of a new company, every small mistake can have a huge influence and could even risk bringing the company to its end.

So how does one get around these obstacles and avoid failure? Porter believes the key is having a plan...

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25 SEPTEMBER 2016

TAU Brain Scholar Wins $50,000 Alzheimer Research Award

特拉维夫大学大脑科学研究者荣膺5万美元阿尔茨海默病研究奖

Prof. Inna Slutsky, head of the Slutsky lab at the TAU Sackler School of Medicine, is the first Israeli researcher to win the prestigious MetLife Foundation Award for Alzheimer Research.

The $50,000 award was presented last week at the Alzheimer's Association International Conference in Toronto where Slutsky was named the most promising investigator.

Prof. Slutsky's research explores the primary mechanisms initiating synaptic and network dysfunctions in Alzheimer's disease. In a recent study published earlier this year in Neuron, a group of researchers led by her explored the IGF-1 receptor and its role in the development of Alzheimer's.

The presence of IGF (Insulin-like...

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De-Know-Polization

知识去垄断

Let us begin with a fundamental observation of the "de-monopolization" of knowledge, a.k.a. "de-know-polization." Until the end of the 20th century, universities were the societal leaders in the creation, transfer, and usage of knowledge. Today, however, this historical role is fundamentally changing.

Most universities are no longer the best place to do research and teach. Their societal service as hubs of knowledge and innovation can be done more effectively elsewhere. What used to be their natural monopoly is currently under attack.

De-know-polization is both a cause for and a response to the disruption of this old monopoly, arising from globalization and digitization. As de-know-polization reveals itself, university leaders will need to take...

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25 OCTOBER 2016

Bridging the Innovation Gap Between Industry and Academia

缩小产业界与学术界之间的创新差异

Numerous gaps are created when industry and academia try to work together. To understand what causes these gaps from the industry point of view, and how they can be reduced, we spoke to Dr. Liat Hayardeni from the Research Department at Teva Pharmaceuticals.

According to Hayardeni, the gap is created because often scientists are led by their research, while industry has a different set of eyes and sees the commercial potential beside science, and what might be needed in the market. She believes that there should be a person or company that helps the scientists and guides them to do research that has an opportunity to be later translated into industry. Hayardeni spoke at the Deep Innovation Workshop held by CIV.

The gap between industry and...

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18 OCTOBER 2016

CIV2017HK – 5 Reasons to Attend and a Special Discount

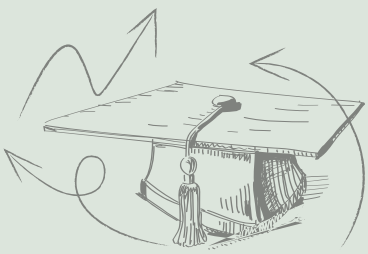
参加2017高校创业视野研讨会的五大理由

If you feel that something's wrong with your university (and trust us, you're not alone…), here are five reasons why you should book a flight to Hong Kong:

1. Universities are no longer the sanctuaries of knowledge they used to be. Students sleep through boring lectures, hate your teaching style, and use Wikipedia as a scientific reference – and that's not even the worst-case scenario.

2. You're a distinguished professor, but your kids would rather start a company (and then another one), than waste four years in outdated college coursework. And even the taxpayers are no longer willing to pay for your travel budget and your kids' liberal arts degrees.

3. You're struggling to secure university funding for a couple...



PUBLISHED
26 SEPTEMBER 2016

Can China's Government Funding Boost Its Universities into Top Ranks?

中国政府的投资是否能够推动中国大学跻身世界前列?

In a plan released recently, the Chinese government envisions its higher education sector rising to world-class levels, and it is eager to improve the international ranking of its universities.

Over the past two decades, the government has been generously funding some of the top universities, with the top institutions receiving billions of dollars. According to a report in the South China Morning Post, in 2014 Tsinghua University received US$2.6 billion in funding, while Peking University received US$1.9 billion. The effort seems to be paying off at least with these two Beijing-based institutions, which made it to the 58th (Tsinghua) and 71st (Peking) places in the worldwide ARWU (Shanghai) rankings.

Why should governments invest...

PUBLISHED
11 SEPTEMBER 2016

One Stroke, Many Colors – University Venture at IIT Madras

画一笔，添多彩——印度理工学院马德拉斯分校的高校创业

Why does the India Institute of Technology in Madras succeed at UniVenture? Because it takes an inclusive, holistic approach.

The authors tell us that this success requires interaction with a wide range of stakeholders, each with their set of expectations:

- Current students – want more practical venture education
- Faculty and staff – want the capacity to engage in venture
- Corporations – want more collaboration
- Alumni – want to contribute expertise and capital
- The government – provides tax incentives and expects outcomes that support national needs...

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Venture Accelerators Build Smart Cities from Scratch

创业孵化器从零开始建立智能城市

"We want to build cities," wrote Adora Cheung and Sam Altman of Y Combinator in a recent press release. The startup accelerator that nurtured AirBnB and Dropbox is embarking on a new project – building a city for humans.

The accelerator's nonprofit arm, YC Research, aims to produce a prototype city, while planning everything – from a 90% reduction in housing expenses to a simplification of the municipal code of laws. The project, currently collecting applications, would become a showcase for new urban policy ideas.

In this rather interesting endeavor, YC follows a path paved by Alphabet (formerly Google, Inc.) a mere two months ago, when it announced that it planned to acquire lands inside cities and establish futuristic...

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28 JUNE 2016

How Did Hong Kong Become the Most Competitive Economy in the World?

香港如何成为全球最具竞争力经济体？

According to an annual report recently published by renowned Swiss business school IMD, the U.S. has surrendered its status as the most competitive economy in the world to none other than Hong Kong. The U.S. is only ranked third on the list, while Switzerland, the IMD home country, came second. And while overcoming the U.S. in competitiveness is an enormous achievement for Hong Kong's economy, it is no less important to note the slide of Hong Kong's closest competitor, Singapore, one position down to the fourth place on the list. In fact, Singapore succeeded in surpassing Hong Kong on the list only once, in 2014.

What is it, then, that makes Hong Kong's economy so competitive? According to Bloomberg, Singapore's stricter rules regarding hiring...

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Staying on the City Growth Treadmill

跟上城市发展“跑步机”的节奏

The ecosystem of businesses that fuel the GDP of any city has to continue to innovate and grow to remain competitive and essential to the global ecosystems in which they operate. The city can be viewed as a treadmill of businesses all running at the right pace to remain in their positions. Some move faster and grow in importance, while others slow down and risk falling off the treadmill only to fall into the depths of liquidation. City leaders need to develop a clear image of their current portfolio of businesses on this treadmill to identify the strategies they need to drive to ensure the continued growth of the region.

The businesses can be grouped into five broad categories that allow the city's interventions to have maximum impact...

PUBLISHED
03 JUNE 2016

If You Can't Beat Them...

假如你无法击败他们...

The market constantly introduces innovation in the urban space, especially when it comes to tourism. Companies like AirBnB, Uber, and others promoting the new sharing economy are changing the way travelers consume products, while constantly challenging the city infrastructure. While formerly a city could control zones and locations of hotels, identity of cab drivers, and health codes in restaurants, new models break all these assumptions and create challenges for cities trying to protect residents and traditional businesses from these changes. But should they!?

The immediate response of cities facing the rising objection of hotels, cab companies, and restaurants is to fight such innovations....

PUBLISHED
23 MAY 2016

Global Cities Render National Borders Obsolete

全球城市淘汰国界

"Cities, not nations, are the key players in a global 'systems change' taking place in the world today," says Parag Khanna, a leading strategist and a Senior Research Fellow at the Lee Kuan Yew School of Public Policy at the National University of Singapore in an interview with *The Atlantic*. In his newly published book, *Connectography*, Khanna outlines the deep changes in our current perception of geography. In the age of hyperconnectivity, physical borders and locations matter less – global communications and supply chains are much more important, shifting the focus of national security and military forces to their protection. And while geographical borders are effectively erased, a new stratum of "global cities" arises – and some of these, boasting a...

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NEWS IN BRIEF

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How Can PE Secure the Future of Japanese Elderly?

私募股权投资将如何保障日本老年人的未来?

According to recent census data (June 2016), the number of elderly people in Japan has increased while the average family has shrunk in size. The number of people aged 65 or older accounts for 26.7% of Japan's population, with a 40% surge in the number of people living in elderly welfare facilities.

Over the past five years, many Japanese baby-boomers ("dankai no sedai") have entered this age category, and the aging of the Japanese population is due to continue as fewer children are being born, while representatives of the second baby-boom are aging as well.

These data present a challenge to Japan's public pension funds, requiring them to employ creative solutions in order to support the aging population. Japan's GPIF, the...

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21 NOVEMBER 2016

Private Equity Isn't All Bad

私募股权基金并非全盘皆“差”

Private equity funds help companies to expand overseas through takeovers, according to recent research soon to be published in the Strategic Management Journal.

Private equity funds often receive criticism for cynically extracting value from companies to the disadvantage of investors. Recent examples include the Dick Smith and Myer IPOs, and the aborted Guvera IPO and its associated financial woes.

This raises the question of what exactly private equity funds do to create value. One way is by using their experience and connections to help facilitate companies' international expansions. This could occur through cross-border IPOs, but it can also occur through overseas investments.

Cross-border takeovers are a...

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12 OCTOBER 2016

Has African Economic Growth Stalled?

非洲经济发展已止步不前?

In the latest World Economic Outlook published on October 4, 2016 by the International Monetary Fund, it has lowered its growth forecast for the U.S. and other advanced economies as a whole to 1.6% from the 2.2% predicted in July. IMF is warning that Brexit and rising protectionism are dragging on a world economy. However, a rebound in emerging and developing economies, which the IMF now expects to grow as a group by 4.2% this year, could offset downward trends in advanced economies and make the global economy grow at 3.1% this year.

For Sub-Saharan Africa this latest report paints a highly mixed picture. Last year, the region's average growth rate was 3.4%, yet for 2016 the IMF predicts a meager growth rate of 1.4%, and for 2017 a slight rebound to 2.9%. Sub-Saharan...

PUBLISHED
05 OCTOBER 2016

US SEC Allows Crowdfunding of Start-Ups

美国证券交易委员会允许初创公司众筹

Ordinary Americans will from now on be able to invest online in companies they believe in, following the Securities and Exchange Commission approval of a new set of rules for the JOBS (Jump-start Our Business Start-ups) Act signed by President Barack Obama four years ago. Until recently, only accredited investors – those with an annual income exceeding $200,000 or a net worth of at least $1 million – could have invested in most deals advertised on numerous investment portals appearing within the past few years.

From now on, U.S.-based start-up companies will be allowed to raise up to $1 million a year via crowdfunding, albeit with rigorous limitations – allowing individuals with income lower than $100,000/year to only invest up to $2,000 in crowdfunding. In addition, the regulatory burden...

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20 MAY 2016

Guest Post: Gary Dushnitsky on Crowdfunding in Europe

客座文章: 加里·杜希尼茨基谈欧洲众筹

Since 2011, the number of crowdfunding platforms (and the amount of capital raised for projects posted on these platforms), has grown exponentially. While the crowdfunding phenomenon has attracted considerable attention, existing research predominantly reflects a U.S.-centric perspective. Europe is an interesting context in which to study the evolution of the crowdfunding industry because of its heterogeneity. The creation and viability of crowdfunding platforms in Europe is highly dependent on country-level characteristics such as population, national entrepreneurial rates, and the presence of platforms operated by incumbent financial organizations such as large banks. Interestingly, lending-based platforms follow a different set of logic and trends, with cultural and legal...

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新闻摘要

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CIV at the UCY C4E 2nd Innovation and Entrepreneurship Forum

科勒风投研究院参与主办塞浦路斯大学企业家精神中心的第二届创新与企业家精神论坛

The 2nd Innovation and Entrepreneurship Forum, organised by the University of Cyprus's Centre for Entrepreneurship in cooperation with the Coller Institute of Venture and PwC Cyprus, was held with great success.

The two-day forum, which took place on 30 November and 1 December 2016, focused on the rapidly changing 21st-century venture ecosystem and the need for the academic community to continuously adapt to the new state of affairs. The forum featured keynote lectures by Nava Swersky-Sofer (Managing Director, IDC Beyond, Israel), Nathan Zeldes (Managing Editor, Coller Venture Review), Dr. Vladi Dvoyris (Director of Venture Community, CIV) and Marcia Trillidou (Scientific Officer, Research Promotion Foundation Cyprus). Analysing the nature of this change...

PUBLISHED
03 DECEMBER 2016

CIV at the Deans Forum of the Chinese National Normal Universities

科勒风投研究院出席中国全国师范大学经济与管理学院（商学院）院长论坛

Dr. Vladi Dvoyris, director of Venture Community at the Coller Institute of Venture, participated in the Deans Forum of National Normal Universities held in Shanghai on November 11–12, 2016. The forum was part of the 3rd Annual Conference of Urban Development and Industrial Economics of China, and was co-hosted by Shanghai Normal University and the Shanghai Municipal Economic Research Association of Urban Development.

Among other foreign representatives, the forum hosted Udi Aharoni, manager of Executive Education at the Coller School of Management, and scholars in management and education from universities in France and the U.S.

For CIV, the forum was an opportunity to present our recent...

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17 NOVEMBER 2016

CIV 2016 Research Award Ceremony Held at ESMT Berlin

科勒风投研究院2016研究奖颁奖典礼在欧洲管理和技术学院（柏林）举办

On September 16, 2016, the CIV 2016 Research Award was presented in a ceremony held at ESMT Berlin, a leading school of management in the center of Berlin, Germany. The monumental building housing ESMT was, until 1990, the seat of the East German government, and today, completely renovated, it has transformed into one of the best business schools in Europe.

The 2016 Research Award winner, Miguel de Oliveira Tavares-Gärtner, a Ph.D. candidate from the School of Economics at the University of Porto, Portugal, presented his award-winning paper. Additional presentations were given by Monika Hauck (WHU – Otto Beisheim School of Management, Vallendar), 2015 CIV Research Grant winner, and by Prof. Yesha Sivan, CIV executive director, who presented the mission, vision...

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17 SEPTEMBER 2016

Introducing Coller Venture Review 2017 Catalog

科勒风投评述——2017文章概览》简介

In the 2017 Coller Venture Review Catalog, you will find the abstracts of 34 articles dealing with the evolving nature of the global venture ecosystem – with direct reference to full versions available to our members online free of charge.

Our research is organized into strands, each addressing a particular aspect of venture. Every issue is dedicated to one such strand, as listed to the right of the table of contents of the catalog.

In the catalog, you will find a diversity of articles, some of which address localized or industry-specific matters, while others present a global point of view. Some present successes and others, failures; some originate in well-developed economies, and some in emerging ones, across five continents. The common thrust of all the articles is actionable knowledge...

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21 AUGUST 2016

2016 CIV Awards – Winners

科勒风投研究院2016研究奖——获奖者

Tel Aviv, Israel – CIV's research awards aim to encourage and celebrate academic research in the field of venture with the goal of making a significant contribution to understanding and shaping the venture ecosystem. These awards and the Institute may provide the winners with a unique platform to discuss and disseminate their work, including participation in our future events.

On August 15, 2016, CIV awarded one Grand Prize, and two Runner-up awards. We hereby announce the winners as follows...

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15 AUGUST 2016

rachel (usa) | class of 2014
company innovator: microsoft

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