WATERLOO STARTUP ECOSYSTEM REPORT

The David vs. Goliath of Startup Ecosystems

The Startup Ecosystem Report Series
Compass.co (formerly Startup Genome)
with the support of Crunchbase

COMPASS

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Contents

Note:
For short we use "Waterloo" to indicate "Waterloo Region". All data in U.S. dollars.

About Compass.co

(formerly Startup Genome)

We came together for one reason:

To radically improve the success rate of businesses.

With 34,000 signups, Compass is the leading solution for automated management reports and benchmarks for small and medium-sized online businesses.

Compass is made for executives who seek insights on how to improve their ROI without having to rely on analysts or consultants. Compass automatically prepares best-practice reports and benchmarks for your weekly and monthly business meetings.

You get your first interactive report in less than two minutes after signing up. Simply connect the tools you use to manage your business and Compass will create your tailored report.

Why we built Compass:

In our research as part of the Startup Genome Project on the success and failure of young firms, we found that most businesses fail not because of competition, but rather due to self-destruction. In other words, they fail because they execute on the wrong things.

In our search for scalable solutions to this problem we learned that peer benchmarks and industry data is one of the most effective ways to help businesses focus on executing what matters most.

Executive Summary

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Canada's Waterloo Region solidly ranks among the top 25 startup ecosystems in the world, boasting approximately 1,100 startups for a population of about half a million people—the second highest startup density in the world after the global leader, Silicon Valley. How can this region be so productive and effective at developing innovative technologies and startups? What can small- and medium-sized ecosystems learn from this real life story of David versus Goliath?

Waterloo's top technical talent, deep sense of community, and the unmatched cooperation and coordination between stakeholders are the pillars of its success. If it can help its startups close the funding gap, especially at the seed stage, take steps towards an integration with the Toronto ecosystem, and solve the challenge—shared with almost all non-U.S. ecosystems—of rapidly scaling U.S. sales, Waterloo can become an international success story.

The Waterloo Region has developed a global reputation for producing top-tier technical talent—and many would say the very best. This has led to the development of a disproportionately high number of innovative technology and tech startups, along with the establishment of R&D centers by some of the world's largest tech companies, namely Google. This feat can be attributed to the region's institutions of higher education, especially the University of Waterloo.

The University's co-op program, with its students graduating with up to two years of work experience, is one of a kind. In combination with a strong entrepreneurial mindset, its graduates are the second most frequently hired in Silicon Valley, behind Stanford.

The ecosystem's performance is also due to Communitech, an innovation center that acts as active coordinator of the ecosystem. It offers accelerator programs, space for startups and other organizations to locate incubators, and informal and formal mentorship programs. Its existence would not be possible without the government of Ontario and its knowledgeable and proactive policymakers who keep its region at the cutting edge of startup ecosystem policies, ever ready to fund new initiatives while letting the private sector lead.

The Waterloo Region has many achievements to be proud of, yet its Performance Index falls short of the world's top 20[1] for both Ecosystem Value and Output (number of startups). Also, its Growth Index of 2.4 is only slightly above the global average of 2.35 (on a 10-point scale with Berlin, the world's fastest growing ecosystem, at 10).

Why are these metrics important? Research conducted for the Global Startup Ecosystem Ranking 2015[1] has established that bigger is better when it comes to startup ecosystems. More startups, resources and experience lead to higher startup performance and the generation of larger exits. These in turn attract more investors, entrepreneurs, and talent to the ecosystem, accelerating its growth, in a virtuous cycle of success.

Appropriately, leaders and policymakers of small and medium-sized ecosystems are asking "How can an ecosystem trigger this virtuous cycle in the first place? How can we accelerate our growth?"

The answer differs for ecosystems at every stage of development and Compass' three-year research into these questions has led to the creation of a lifecycle model that structures the problems and the solutions (see section 2).

1 For more information see Compass' Global Startup Ecosystem Ranking 2015 at http://startup-ecosystem.compass.co/ser2015/

This model is useful to guide ecosystem leaders and policy makers towards actions that further an ecosystem's growth at each phase of development. For ecosystems in the Activation phase, Compass' upcoming Hong Kong Startup Ecosystem Report will provide recommendations on how to further their development and growth.

According to the Ecosystem Lifecycle model, Waterloo's Growth & Attraction Indexes suggest it has reached the Maturity phase. More specifically, it is in the upper end of that phase in terms of growth and in the "Regional & National" Attraction section.

> Waterloo's Startup Density, second only to Silicon Valley, speaks to the incredible productivity of the region

From both the Integration or Maturity phases, the central goal of ecosystems plateaued in the Regional & National Attraction segment must be to create the very large, internationally exciting exits that trigger the ecosystem to become an international pole of attraction for resources. To achieve that objective, the core issue they must address is startup performance.

Two key factors contribute to the lack of large exits and unicorns in Waterloo and other Canadian ecosystems, and they are common problems in under-performing ecosystems.

First, Waterloo's startup valuations grow more slowly because revenue growth is much slower. The root cause is a Global Market Reach gap, centered around customer development (as defined by Steve Blank) and growth. Research reveals that Canadian

startups do not prioritize foreign customers from the onset as much as startups from top ecosystems do. In addition, Canadian startups almost always make the decision to start attacking the U.S. market from Canada.

The second issue is a Funding gap, mainly at the seed level, but also in local Series A financing. Fewer angels and institutional investors are competing for startups, leading to lower amounts than seen by their American counterparts. More importantly, a dramatically lower proportion of startups than in Silicon Valley secure seed funding—four times less!

Key lessons for startups in Waterloo and other small and medium-sized ecosystems start with focusing customer development activities on foreign customers and global market needs and by building a growth team organically in the selected foreign market. This can mean targeting U.S.-based businesses using experienced American sales and marketing people who bring their contact lists, existing relationships, adapted work processes, and culture. Actions such as these can be executed by startups themselves.

Other actions require the consensus and coordinated efforts of ecosystem leaders, policymakers, and other stakeholders. Together they can work to support their startups in "going global" by activating their international communities and funding growth-focused hubs and programs based in the U.S. and managed by people with deep startup experience.

Drawing from successful policies executed in other ecosystems, policymakers can help solve gaps in seed and Series A funding through matching funds and tax credit programs dedicated to one type of round and investing as LPs in local funds and foreign funds willing to open offices in the ecosystem.

A final dimension of a potential solution is to integrate Toronto and Waterloo into an innovation corridor like San Francisco-San Jose or London-Cambridge, both of which successfully mitigate their similar geographic distance through common transportation solutions including trains and buses. As importantly, stakeholders would have to truly integrate their activities, and later their communication, so global startup communities consider it a truly integrated corridor. A combined Toronto-Waterloo ecosystem would be more attractive to both national and international entrepreneurs and investors, helping solve the scaling and funding gaps.

Therefore, in order to accelerate the growth of the ecosystem and its startups, Waterloo stakeholders need to focus on:

1) Solving the problem with scaling into the U.S. and globally
2) Closing the funding gap, especially at the seed stage but also at Series A, and
3) Integrating Toronto and Waterloo into a larger, more globally attractive startup ecosystem

Combined with Waterloo's top technical talent and its outstanding productivity in creating innovative technologies and startups, addressing these issues can lead to the production of large exists and unicorns, in turn attracting the international entrepreneurs, capital, and other resources that are needed to grow the ecosystem at a faster, inorganic growth rate. More importantly, it could propel the region to become an even bigger engine of economic growth and job creation.

Startup Ecosystem Lifecycle

2

By JF Gauthier, CFO & Head of Business Development, Compass;
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and Max Marmer, Writer and Founder Emeritus, Compass

As high-growth technology startups have become the primary growth engine of the new Information Economy, the recent development of startup ecosystems blossoming all over the world has big consequences for the future of the global economy.

While nearly all high-growth technology startups have historically emerged from no more than three or four startup ecosystems, primarily Silicon Valley and Boston, this trend appears to have reached its end. Simultaneous with the global explosion of entrepreneurship has been an explosion in the rise of new startup ecosystems around the world and a newfound maturity in others.

Like Waterloo, all ecosystems–whether small, medium, or large–share the goal to accelerate their growth. Learning from the evolution of other ecosystems to understand what triggers such an acceleration to inorganic growth rates can greatly inform their strategy.

This section of the report proposes a model of how startup ecosystems evolve, grow, and mature, based on Compass' three-year research into those issues.

2.1 Lifecycle Phases

Startup Ecosystems are more than just the presence of some number of startups in the city or region. They include the presence of other types of resources such as capital, investors, talent, customers interested in innovation, and more. Ecosystems develop first through the Activation phase by "Catch Up Growth", increasing the productivity of their organic (local) resources by attracting know-how through interactions with stakeholders from the world's best ecosystems. During this phase local stakeholders increasingly learn and use global best practices specific to tech startups such as Silicon Valley-style venture financing and Steve Blank's Customer Development methodology.

Once an ecosystem has maximized the use of its organic resources through best practices it has achieved what Michael Porter would call the productivity frontier. Few startup ecosystems around the world have reached that state. Therefore they start producing more and larger exits than other ecosystems in their state, region or country.

These exits act as the trigger that graduates the ecosystem to the Integration phase. From here, its growth accelerates to an inorganic rate as external resources (entrepreneurs, talent, and investors) start moving to the ecosystem from all over the region or country—and, if it produces several internationally exciting exits and unicorns, from all over the world. It has become a pole of attraction for startup resources. This is what is called Attraction.

The Attraction metric scores an ecosystem based mainly on:

1. The number of startups and larger tech companies that move their headquarter to the ecosystem,
2. The number of secondary offices opened by investors that are headquartered outside the ecosystem,
3. The number of entrepreneurs who move to the ecosystem before starting a startup and specifically for this purpose (note this metric has yet to be included in our data-driven model),
4. The number of secondary offices opened by startups and larger tech companies that are headquartered outside the ecosystem.

Secondary offices opened by startup and tech companies have a less direct impact on an ecosystem's growth because they mostly attract know-how rather than resources.

Over time an ecosystem grows to a larger size than was possible from its organic resources only. It enters the Maturity phase as its relative growth, calculated on a larger and larger denominator, inevitably slows down.

Based on the study of the evolution of ecosystems over time and the measure of these two key metrics (Growth Index and Attraction), we propose the following model describing how startup ecosystems evolve through four major development phases, with a number of key sub-stages.

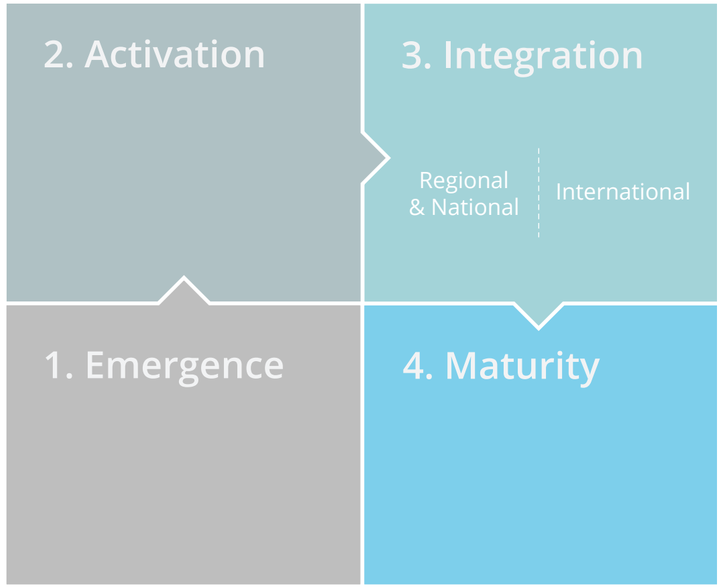
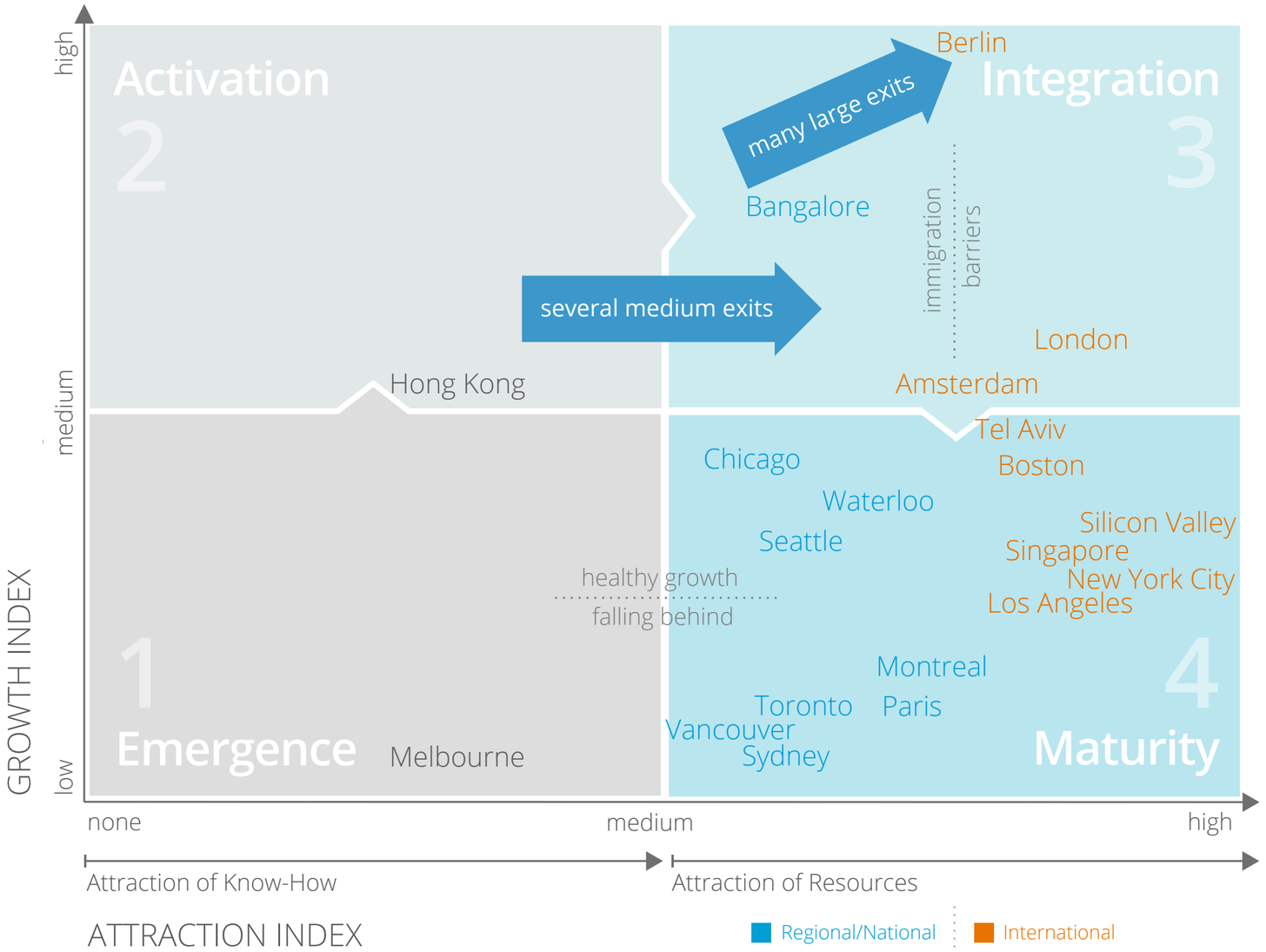


Figure 1. **The Startup Ecosystem Lifecycle**



2.2 Detailed Model

1) Emergence

The Emergence phase is the first phase of the Startup Ecosystem Lifecycle. The Emergence phase begins when a city gathers or assembles the necessary resources for a startup ecosystem to come to life. For a startup ecosystem to successfully emerge, the inception process requires crossing a threshold of critical mass, where usually at least a few dozen startups are founded within a few blocks or within a small neighborhood (such as University Avenue in Palo Alto), select locations along Route 128 in Boston, or a few key blocks in downtown Boulder.

Startup ecosystems in the Emergence phase are characterized by a slow growth rate. Their growth is organic, i.e. all the resources come from within the metropolitan city, and the rate-limiting growth factor is simply the lack of development of the core components of a startup ecosystem due to its nascency.

In the Emergence phase startup ecosystems likely lack many of the key features needed for a startup ecosystem to thrive:

- A well-defined angel and Venture Capital community to finance high risk tech startups.
- Knowledgeable and startup-adapted service providers such as lawyers, accountants, and other specialized consultants.
- Entrepreneurial tech and design talent for hire.
- Serial entrepreneurs, advisors, and mentors ready and willing to share their hard-earned lessons from the battlefield with the next generation of entrepreneurs.

- Large and medium sized enterprises willing to take a risk on doing business with fledgling startups.
- Startup friendly government policies to support the ease of company formation, hiring and firing, and capital allocation.

The most important ingredient for a successful startup ecosystem at this phase is a community of tenacious, visionary entrepreneurs who won't let the lack of support and resources get in the way of creating successful high-growth tech startups.

One of the best ways to foster a vibrant, entrepreneur community is to nurture it with many types of events: conferences, meet-ups, and events such as Startup Weekends. These events are powerful because it is critical that entrepreneurs meet each other face-to-face, form bonds, share tips and challenges, and feel the support and camaraderie of their fellow entrepreneurs on their journey. Entrepreneurship is an incredibly unique endeavor–one that can make entrepreneurs' psychological state rapidly oscillate from euphoric highs to grueling lows. Having a social support structure composed of other entrepreneurs who can empathize and commiserate through the vicissitudes of the entrepreneurial journey is critical for the success of startups, especially in a newly forming ecosystem.

2) Activation

In the Activation phase of a startup ecosystem many of the core components have begun to ripen and solidify. The startup ecosystems that complete this phase with the most speed and success utilize a process we call "Catch Up Growth", where local startup community leaders and policy makers engage in a concerted effort to increase interactions between their stakeholders and those of top ecosystems to import the explicit and implicit structures, knowledge, and culture that made Silicon Valley successful. In doing so they increase the productivity at which they utilize local resources, leading to more startups reaching a successful exit, and in turn fostering an increase in local entrepreneurship.

Startup ecosystems in the Activation phase cannot grow exponentially fast like startup ecosystems in the Integration phase, but as both entrepreneurship and resource productivity increase, they grow faster than startup ecosystems that have leveled off in the Maturity phase.

The process of Catch Up Growth resembles aspects of Peter Thiel's core thesis in his bestselling book Zero to One, where he distinguishes between two types of innovation: "Zero to One" and "One to N". Thiel's model was focused on the perspective of an individual startup, but the same model can be applied analogously to startup ecosystems. From a startup ecosystem perspective, "Zero to One" innovation is what Silicon Valley began doing in the 1960's when their startup ecosystem was born essentially from scratch. At the time there was no architectural blueprint for how to build a startup ecosystem as no other high tech startup ecosystem had ever been successfully created before. "One to N" innovation is similar to Catch Up Growth. This is what most other startup ecosystems are doing now around the world, where they attempt to accelerate the growth of their startup ecosystem by copying the relevant aspects of what worked in Silicon Valley.

Notable examples of startup ecosystems that successfully employed strategies of Catch Up Growth include Tel Aviv, Beijing, and Santiago de Chile.

- In the 90s, the Israeli government and the Municipality of Tel Aviv-Yafo decided to take a much more hands-on approach to accelerate the growth of their startup ecosystem. One of the key strategies they employed was offering a 50% matching investment as a Limited Partner to any local VC fund that met two key criteria: 1) The fund had at least one foreign VC partner moving to the ecosystem , thereby bringing experience from a foreign startup ecosystem, and 2) one VC partner who was a native Israeli.
- Chinese startup ecosystems like Beijing are known for having very similar financial deal structures to Silicon Valley at all the key stages of startup growth: seed, Series A, Series B, and Series C. The cross-pollination happened as a result of many Chinese investors and entrepreneurs spending time in a variety of relevant systems and environments in the United States including its university system, startups, and Venture Capital firms. Many of these Chinese nationals then carried their learnings back to China and infused local startup ecosystems with their knowledge and experience.
- The Chilean government in Santiago hatched an innovative program called Startup Chile, where they essentially offered free grant money to experienced entrepreneurs from established startup ecosystems to set up new companies in Santiago with the expected benefit that they would share their knowledge, wisdom, strategy, and tactics with the local talent. This would occur, for example, as migrant entrepreneurs shared their strategy and experience of what a good business model is, how to pitch a startup to investors, how to use lean methodology for efficient product development, and how to stomach the risky roller coaster ride of a startup. It was not critical or expected for the founders who came to Santiago on a Startup Chile grant to stay in Santiago. The primary motivation for the Chilean government was to have foreign entrepreneurs infuse their experience into the Santiago ecosystem and inspire a chain reaction in the local culture where, for instance, bright, young local talent now felt comfortable and inspired to forgo a conventional corporate career path in favor of starting their own startups instead.

3) Integration

The Integration phase of the startup ecosystem lifecycle is all about the startup ecosystem generating success stories and exits in order to establish a gravitational force that attracts resources from across the region, nation, and global economy.

We've divided the Integration phase into two sub-phases based on the extent of resource attraction: 3a) Regional & National and 3b) International. The reason regional and national levels of attraction are merged together is to normalize the effect of regions and countries with varying sizes. For instance, Austin and Berlin have gone through similar phases internally as startup ecosystems, but Austin was integrating the resources across the American Southwest, whereas Berlin was integrating resources from all across Germany. Yet the overall flow of talent and capital was similar for both Austin and Berlin, despite one performing regional integration and the other national integration, hence the similar grouping.

3a) Regional & National Integration

The key trigger for a startup ecosystem to move from Activation to the first phase of Integration is several small or medium-sized exits (of $100-$500 million) that are exciting, unique, or remarkable at a regional or national level. Exits are the crucial performance indicator needed for a startup ecosystem to attract all the key stakeholders and resources required for further growth in the Integration phase. The more developed startup ecosystems there are within a given region or nation, the higher the threshold is for a startup ecosystem to move from the Activation phase to the Integration phase.

The Integration phase is characterized by ***inorganic growth***, where talent, capital, and other resources are flowing into the startup ecosystem from outside its boundaries. The extent to which this process of talent and capital migration occurs is measured mainly by the relocation of startup headquarters and the establishment of second offices of venture capital firms.

This inflow of external resources and reach for Inorganic Growth also means there is somewhat of a zero-sum game— in fact, a startup ecosystem enters in direct competition with other startup ecosystems for the same set of regional and national resources. This leads to a concentration of resources and means there is a finite set of ecosystems that can become Regional and/or National poles of attraction. Practice shows that there may be only one or two fast-growing startup ecosystems— or none—in most medium-sized countries, with room for more only if the national market size is very big. If a startup ecosystem does not trigger an accelerated growth through medium sized exits relatively quickly, it is in danger of its present and potential future stakeholders losing their passion and hope for the ecosystem's worthiness, and consequently taking their energy and resources to a different startup ecosystem instead.

This at least partially explains why Canada, with an impressive number of three ecosystems in the top 20 (vs. seven for the U.S. and five for Europe) despite a population less than 1/10th the size of the U.S. and Europe, has seen its ecosystems fall in the rankings. More specifically, its top ecosystems did not grow in terms of Exit Value, while top U.S. ecosystems grew more than 40% and top European ecosystems grew more than 300%.[1]

1 Based on a 2-year moving average.

In order to attract these regional or national resources and concentrate them in a larger and larger ecosystem, it is key for one startup ecosystem to be branded as a more attractive, more exciting place to start a tech company than other locations.

A critical part of the process of Regional & National Integration is for the startup ecosystem to develop close interdependent relationships between the major institutions of the regional and national economy. This means connecting with regional and national universities, establishing an inspirational presence on its campuses with startup job fairs for students, pushing leading software engineering technologies and development methods into the local curricula, and creating formal and informal pathways of interaction with the professors and graduate research students, especially those developing potentially game-changing technologies that can be commercialized intoby high potential startups.

It is also important that the local government does more than just "get out of the way" of entrepreneurs and investors by not creating policies that impede the progress of a startup ecosystem progress, but rather actively create new policies that anticipate the coming challenges of the startup ecosystem, thereby accelerating its overall growth by being ahead of the curve.

Startups which establish second offices in other ecosystems (in order to expand their engineering or sales capacities) contribute significantly to progress in the Activation phase, while such initiatives do not achieve much in the Integration phase. To progress in the Integration phase, a startup ecosystem must produce a number of exits large enough to inspire entrepreneurs and VCs to re-locate their headquarters.

3b) International Integration

The key trigger for an ecosystem to move from the Regional & National Integration stage to the International Integration stage is to have several very large exits, for instance four to six companies valued at over $1 billion—a valuation threshold that now affectionately bestows the moniker “unicorn”.

At the International Integration stage, the pace of inorganic growth has been ratcheted up another level. Startups have become the primary growth engine of economic progress in the Information Era, and the global startup ecosystem on the whole is rapidly expanding.

If a startup ecosystem becomes an international pole of attraction for resources there is essentially no upper limit to growth, as many global entrepreneurs, investors, and other ecosystem resources will be interested in migrating there. So the primary rate-limiting factor to startup ecosystem growth in this stage are barriers to immigration and the startup ecosystem’s infrastructural ability to support the influx of talent. This can be represented by sub-factors such as a) open and flexible immigration policies, b) available housing, c) low living costs, and d) an evolution towards cultural internationalization that can easily support the integration of people who hail from nations all around the world.

English has become the de facto language of international business, so a pervasive English speaking culture also helps to compete with other ecosystems in the International Integration stage. Our research and interviews show there is a significant barrier to immigration when English is not the first language of an ecosystem, or at least not very widely spoken by its population on a normal basis. For instance, while many startups in Berlin and their internal operations are in English, the fact remains that it is a truly German city, and this makes non-German speakers, investors, and entrepreneurs alike more hesitant to immigrate. Similar issues have also been described in major ecosystems like Moscow and Paris.

The lack of cosmopolitan status is also an inhibiting factor for the growth of many startup ecosystems. For instance, the communities in San Francisco and New York City are incredibly diverse and immigrants can almost always find other people from their native culture within these cities. That is a much more difficult task in other, less cosmopolitan North American ecosystems. These cultural barriers are not deal-breakers but they do make some ecosystems more favorable compared to others.

In the International Integration phase the startup ecosystem builds an international reputation as a hotspot for innovation and economic growth, and fresh talent and capital is migrating to this ecosystem from all over the world. It has achieved explosive growth and the movement of resource is such that it has become an integral part of the global startup community.

As a startup ecosystem solidifies itself as an Internationally Integrated ecosystem, it gains a seat in the global ecosystems network, in the normal flow of people and resources between ecosystems. Large corporations in search of new technologies, as well as investors, entrepreneurs, and talent (both managerial and technical) in search of opportunities will add the ecosystem to their regular route or top list of locations.

By the time a startup ecosystem has moved into the International Integration sub-stage, it will have begun to accumulate so many success stories that the prospects of big success feels completely natural to new entrepreneurs. The culture will have evolved to a state where a significant portion of the region or country’s next generation of “best and brightest” have entrepreneurship as their #1 career choice, and they are ready to start a new company if they can find or form a team with a compelling enough vision. The successes will also have brought experienced upper level management to the region from all over the country and many early employees with experience in successful startups will have transitioned to becoming founders or angel investors themselves. The establishment of the feedback loop of capital and experience from successful startups being fed back into the formation of new startups is one of the most critical virtuous cycles that strengthen a startup ecosystem.

The global startup landscape has begun to stabilize as an interdependent, somewhat hierarchical structure, which inherently limits the number of possible startup ecosystems capable of making it into the International Integration stage. However, as the total size of the tech sector increases within the global economy, opportunities for newcomers to enter the International Integration sub-stage without having to unseat an incumbent ecosystem will increase.

4) Maturity

Over time an ecosystem in the Integration phase grows to a larger size than was possible from its organic resources only. The trigger for a startup ecosystem to enter the Maturity stage is when the growth of its resource attraction has begun to level off and its relative growth rate, calculated on a larger and larger denominator, inevitably slows down. Broad resource attraction has lead to the ecosystem building a fairly balanced set of resources across all factors. The transition between the Integration phase and the Maturity phase has yet to be modeled and defined more precisely, but the aforementioned pattern is a solid heuristic that will be furthered studied in the near future.

Startup ecosystems enter Maturity from either of the two Integration sub-stages and remind in the same sub-stage: a) Regional & National Maturity or b) International Maturity. For instance, Canadian ecosystems such as Vancouver, Toronto, and Montreal achieved Regional & National Integration, but have been unable to cross the barrier into International Integration. Consequently, as their inorganic growth has leveled off they are now considered to be in the Regional & National Maturity sub-stage.

Overall, there is a clear relationship between an ecosystem's growth rates and its age. Startup ecosystems that entered the Maturity phase from International Integration (such as Silicon Valley, Los Angeles, New York, and London) also have seen their relative growth level off but they are so large as a result of being such strong international poles of attraction for resources for many years that even a slower relative growth rate is still equivalent to tremendous economic growth in absolute terms.

Let's look at an example to highlight the dynamic of how relative growth rates slow as an ecosystem grows, yet its absolute growth remains impressive. While Berlin was ranked as the fastest growing startup ecosystem in the world in Compass' the Startup Ecosystem Ranking 2015, its absolute size is still very small compared to Silicon Valley: one-seventh the number of startups, one-eighth the Exit Value, one-eleventh the VC investments). Silicon Valley's below-average growth rate still translates into a $17 billion growth in Exit Value versus $15 billion for Berlin.

In the Maturity phase of the startup ecosystem lifecycle, the startup ecosystem has given life to numerous success stories and has—rather sophisticatedly—integrated all of its local resources. The key focus for the continued evolution of the startup ecosystem at the Maturity phase is for it to strengthen its national and international ties, develop new internationally differentiated specializations, and actively aim to get ahead of future waves of innovation. This is done by its stakeholders and leaders anticipating what science, technology, and infrastructure is needed years before they are ready for prime time. Another area where a startup ecosystem can differentiate itself is the degree to which it stays on the cutting edge of the burgeoning science of entrepreneurship management. This could mean coming up with new innovative practices for how to run a startup, create cultures that amplify employee's creative potential, develop or foster new types of financing instruments, or foster types of specialized startup service providers.

3 Ecosystem Description and Stakeholder Perspectives

3.1 Description

At first glance the Waterloo Region, located 65 miles (105 km) from downtown Toronto, may seem like your typical university town. It has a population of about 550,000 people and is home to two universities. But behind its modest exterior, Waterloo is actually one of the world's top 25 startup innovation hubs.

The Waterloo Region startup ecosystem was built with a clear intention to provide value and give back to the community. This collaborative mentality, along with the close proximity of startup offices ("you can easily walk to any company" is a frequent comment by local startup people), has led to a tight-knit startup community where entrepreneurs meet up regularly and rely on one another.

At the center of this ecosystem is Communitech, an industry-driven startup hub and innovation center that fosters and supports a community of 1,100 tech startups. The organization is an active coordinator of the ecosystem and offers informal and formal mentorship programs, accelerator programs, and space for startups and other organizations to locate incubators. It is also responsible for kickstarting and securing funding for most community initiatives.

Other important resources exist in the region, such as the Accelerator Centre, University of Waterloo's Velocity program and Wilfrid Laurier University's Launchpad program, which provide in-depth mentoring to startups in the community.

One of Waterloo's key strengths is the constant flow of talented young people. Because of the concerted emphasis on entrepreneurship, both at University of Waterloo and at Wilfrid Laurier University, many of the young graduates are eager to either work for a startup or build their own.

Enthusiasm for startups is one piece of the puzzle, but many graduating from the University of Waterloo or Wilfrid Laurier University have also accumulated up to two years of real work experience, thanks to the universities' co-op programs. This co-op model which originated at the University of Waterloo has now spread to over 100 colleges and universities across Canada. More than 60% of Waterloo's undergraduate students, and about 50% of Wilfrid Laurier's BBA students are enrolled in the co-op program. And there are more than 5,000 employers eager to hire them, including 864 in Silicon Valley alone (2015). Students graduate in five instead of four years, with up to two years of paid work experience under their belt.

> Behind its modest exterior, Waterloo is actually one of the world's top 25 startup hubs

The 2015 QS World University Rankings placed the University of Waterloo 24th for Computer Science and 20th for Mathematics globally.[1] It ranks even higher in the minds of tech recruiters because the school produces the second most frequently hired candidates in Silicon Valley.

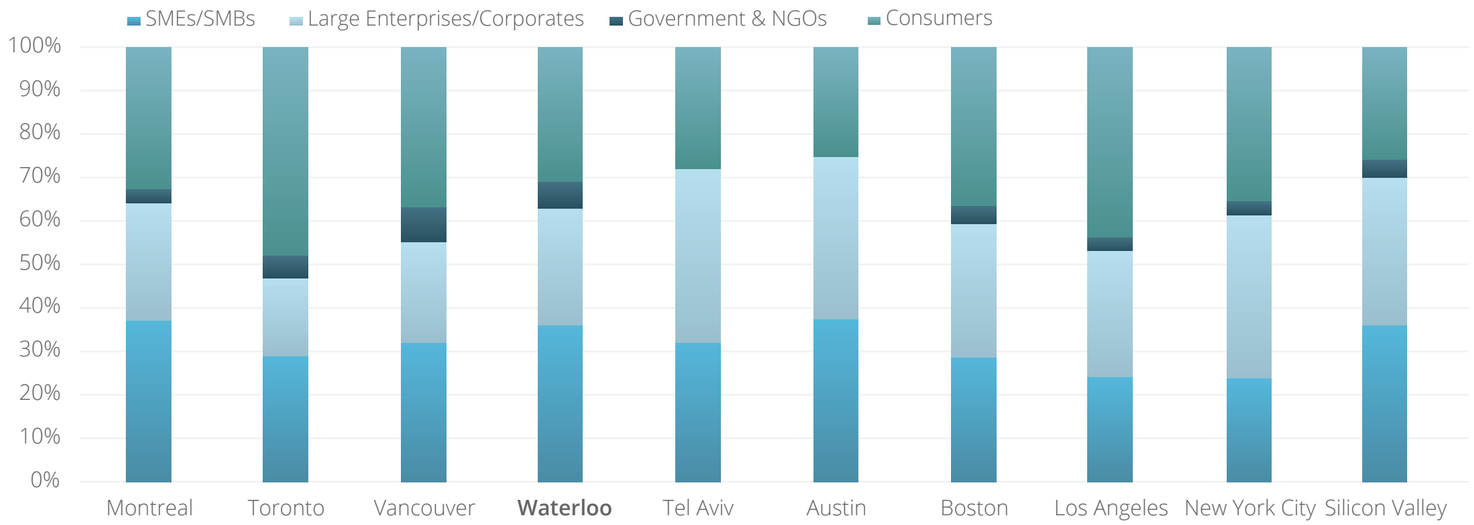
In addition, the newly-renamed Lazaridis School of Business and Economics at Wilfrid Laurier University has the largest undergraduate business degree co-op program in Canada, with around 2,000 Bachelor of Business Administration (BBA) students. In April 2015 Wilfrid Laurier University created the Lazaridis Institute for the Management of Technology Enterprises, with the mission to become a leading international center for teaching, research, and executive development related to the growth of globally competitive technology companies. Its purpose will be to address the gap in management and leadership talent that is limiting the growth of technology companies in Canada.

In many ways, the strengths of the two major universities in the Waterloo Region complement each other, given the Lazaridis School's top five ranking as the best school in Canada for sales professionals and marketers, and the University of Waterloo's strength in turning out top math, science and engineering graduates.

With this pool of quality talent and an attractive cost of living and quality of life, it is no wonder that the Waterloo Region attracts entrepreneurs from all over the country. A recurring statement in expert interviews was that "there is something about this community that makes people stay". Locals aren't the only ones taking note. Large international companies like Google, Square, Shopify, and others are setting up divisions in Waterloo. From a local perspective this not only validates the quality and availability of technical talent but brings experience in hypergrowth tech companies to the region as well as creating more opportunities for local startups with regards to acquisitions, sales, and potential partnerships.

1 http://www.topuniversities.com/universities/university-waterloo

Figure 2. The Distribution of Customers in selected Startup Ecosystems



According to the 2015 Global Compass survey, 69% of Waterloo startups are B2B (business-to-business), which positions the region just above the median of top North American ecosystems.

This is the highest rate in Canada; Montreal is a close second at 67%, while Toronto is only at 52% (see Figure 2). Interestingly, Waterloo has one the highest proportion of startups focused on SMBs (SMEs), along with Austin and Silicon Valley, and the highest percentage focused on government and NGOs.

The lower proportion of B2C startups in Waterloo is no surprise. Having a large local population as well as large representation of local B2C tech companies that can become partners and channels to startups provide a tremendous advantage when developing a B2C model. For this reason the biggest B2C exits have happened in Silicon Valley and other large U.S. cities, with the highest percentage of B2C in Los Angeles (44%) and New York (36%). However, as the tremendous success of Kik (Waterloo), SoundCloud (Berlin), and Spotify (Stockholm) demonstrate, successful B2C companies can be built anywhere.

The Local Tech Economy

About 37,000 companies comprise the Information and Communications Technologies (ICT) sector in Ontario, of which 87.6% are in the software and computer services industries. Ontario is first in Canada and second in North America in terms of number of businesses in the ICT sector.

Meanwhile, the Waterloo Communitech hub boasts 1,100 startups, which is around 3.6% of the total number of ICT companies in Canada.

When looking at job creation, the ICT sector in Ontario employs about 250,000 people, representing approximately 47% of total ICT jobs across Canada. The ICT sector's share of national employment increased from 3.3% in 1993 to 4.0% in 2013, amounting to 530,957 total employees.

From 2007 to 2013, ICT sector revenues increased from $133.4 to $159.9 billion, a 19.8% increase led by the software and computer services sub-sector. This industry also contributed $69.5 billion to the Canadian GDP in 2013 (in 2007 constant dollars), accounting for 4.4% of the Canadian GDP. The software and computer services industries accounted for the highest growth in GDP in 2013, up 4.7%.

3.2 Entrepreneurs' Persona

The University of Waterloo is one of the driving forces behind the local startup community. The inflow of recent graduates into the ecosystem (and possibly the seed funding gap discussed on page 34) is clearly impacting the average age of Waterloo-based founders, which, as shown by the Compass survey, are on average only 29.5 years old. This is almost three years younger than founders in Montreal (32 years old) and on average six years younger than founders in leading American ecosystems (35.7 years). Toronto founders are an average age of 36.7 years old.

The lack of gender equality is common across all startup ecosystems, as can be seen by Figure 4. With software engineering being a traditionally male-dominated field, only every fifth founder in Waterloo is female. Montreal is the only Canadian ecosystem that has a slightly higher share of women founders (22%), which is equivalent to the average of the top four ecosystems within the United States.

Figure 3. **Average Founder Age (in years)**

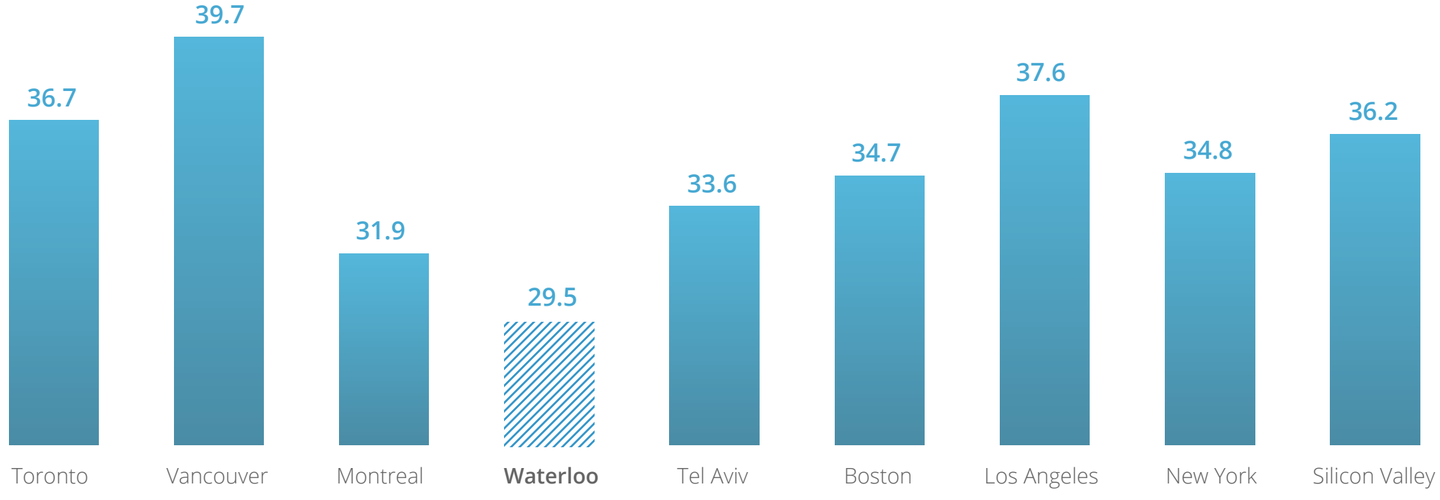
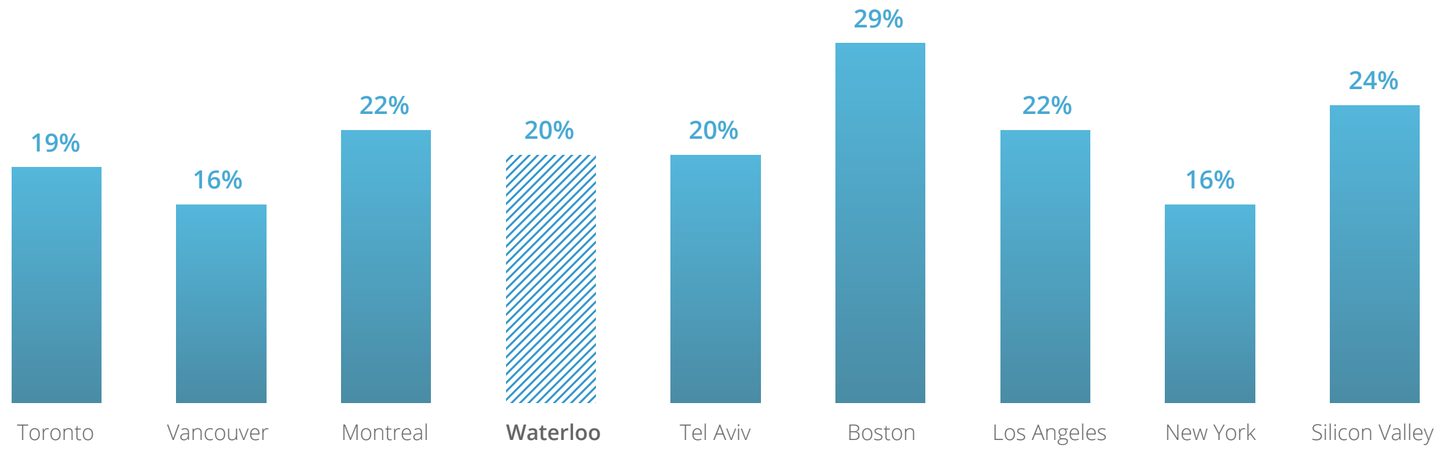


Figure 4. **Women Founders**



3.3 Perspectives on the Ecosystem in Waterloo

This section provides an insider's perspective on the startup ecosystem in Waterloo. The information has been gathered through in-person interviews in Waterloo, as well as phone interviews with relevant stakeholders. Given the personal nature of these stories, some may not be fully representative of the general view on the ecosystem.

3.3.1 Entrepreneur Perspective

One of the key differences between the ecosystem in Waterloo and other places is that "every single company is within a 3 km [~2 miles] radius; there are 1,000 companies in that hub so you can practically walk up the street and find anyone you need. In Toronto there is no such centralized community," says Michael Litt, CEO at Vidyard.

It is clear that most people in Waterloo are satisfied with their community and when you visit the region it's easy to understand why: there is easy access to beautiful nature, great public schools, good public healthcare, and generally a very high quality of life, all of which has proven to be an important factor for many entrepreneurs when deciding where to start and grow their businesses. Also the Canadian culture and its kind people was mentioned repeatedly as an important factor: "It's a lot easier to find non-pretentious, effective people here with whom you can interact constructively and get things done," said Alex Leyn, CEO at Aterica Health.

At the heart of the entrepreneurial community is Communitech, the epicenter for everything related to tech entrepreneurship.

"Communitech is the physical center of Waterloo's tech and startup community," said Beth Nenniger, Director at the BuildDirect Design Center. Communitech caters to entrepreneurs at all stages and offers easy access to mentors, investors, service providers, and most importantly, other like-minded entrepreneurs.

Having a central hub for the whole community is rare among ecosystems, and Waterloo enjoys its many benefits. Because Communitech is widely recognized as the one place to go to for startups, everyone in the community can be accessed through the network. This effective model sets an example for other ecosystems around the world.

One downside to note—while this close-knit community has obvious benefits, some are starting to see the mentality it fosters as a bit of an issue. "Entrepreneurs don't know enough people outside of the community and many don't truly understand what's going on around the world," said Mike Kirkup, Director at Velocity.

Talent

When outsiders talk about Waterloo, it's very often on the topic of technical talent. University of Waterloo has been particularly good at putting Waterloo on the map with their Co-operative Education program that enables students to do a series of four-month internships at leading companies around the world. "If you ask around Silicon Valley, all the top companies will have had an intern from Waterloo, so that's how they know about the region," said Kevin Carter, General Partner at SV Angel.

It's one thing to have technical talent, it's another thing to have a critical mass of entrepreneurial students, but Waterloo seems to have an edge. "A high percentage of CS and engineering students come to University of Waterloo to become entrepreneurs—the entrepreneurial culture is one of the ecosystem's greatest strengths", said Steven Woods, Engineering Director at Google Canada.

Part of the success also comes from the University' of Waterloos approach to commercialization of intellectual property. Alex Leyn, CEO at Aterica Health, said, "University of Waterloo formally encourages researchers and students to go ahead and commercialize their research and inventions. And UW has influenced other neighboring schools, such as University of Guelph, to do the same. Even more importantly than simply enabling more innovation to become commercialized, these kinds of non-traditional policies attract the more business-focused innovator-researchers to the area. That's key."

> The entrepreneurial culture is one of the ecosystem's greatest strengths

With regards to talent in Waterloo, it's important to note that those who decide to stay in the region stay significantly longer than in other cities. Michael Litt explained, "when you've spent time and money training new hires, it's great to know that they will stick around for a while". He mentioned that they "haven't had a single engineer leave their company".

Woods adds: "There is great loyalty in this community—people value people here, are happy here, and choose to stay—through good times and bad."

Entrepreneurs agree that it can be challenging to attract outside talent though, especially in the fields of sales & marketing and design. Despite the great quality of life found in the region, young people often prefer working and living in metropoles like New York over a small-sized city.

Funding

When asked about the funding situation in Waterloo it is clear that most entrepreneurs struggled to get access to capital. Many seem to believe that they need to go to the U.S. to get funding, "otherwise you can't raise, it will take much longer, and you'll get a lower valuation," said an anonymous entrepreneur in Kitchener. However, it was often noted that the situation is improving and that local investors are getting better at understanding tech investing, which speeds up the funding process and makes it possible for local entrepreneurs to get comparable valuations.

The general consensus is that not enough outside VCs set up offices in Toronto or Waterloo. They might stop by to have meetings but they aren't present on a day-to-day basis.

On a positive note, it was mentioned that startups in the region have great access to numerous government grants which enable many startups to get off the ground without giving away equity to investors.

3.3.2 Investor Perspective

> "I think Waterloo is the most impressive up-and-coming startup city I've been to." —Sam Altman, President, Y Combinator

Waterloo has developed a strong reputation within the investor community in both New York City and Silicon Valley for producing

> Silicon Valley VC partners rate Waterloo as one of the top 3 to 5 talent pools in North America

investment-worthy companies. Recent success stories like Kik, Thalmic Labs, and Vidyard have helped bolster this image, and while the distance to Waterloo can be an obstacle for certain investors, many are still making the trip.

A high proportion of startups in Waterloo receive funding from U.S. investors, and because of the cost effectiveness of hiring and retaining talent in Waterloo, they are encouraged to keep the team there as opposed to relocating to New York or Silicon Valley. A good example of this was when Silicon Valley super-angel Ron Conway recommended Michael Litt to keep his company Vidyard in Waterloo because it would be much more cost effective than moving the team to Silicon Valley.

Funding

While several sources have indicated great improvements in the funding landscape, many entrepreneurs continuously struggle to access local capital for their startups. "So many startups end up not being able to raise capital and die," said Carol Leaman, CEO at Axonify. This problem is not limited to Waterloo, but rather seen across Canada to various degrees.

The conservative nature of Canadian investors and their focus on revenue early on can end up ruling out certain high-growth business models. In addition, there is a concern that certain investors aren't up-to-date regarding the way tech investing works. If they aren't tech investors, it can make the investment process long and cumbersome for the entrepreneurs.

> "Lots of people around Waterloo have money, but haven't traditionally invested in tech. This is slowly, but visibly, changing."
> —Alex Leyn, CEO at Aterica Health

> "The issue is that most people with money don't invest in tech. There is lots of wealth but that's not how they made their money so they are scared of it."
> —Carol Leaman, CEO at Axonify

When discussing the local Golden Triangle Angel Network there are mixed reviews.

Pitching to local angel networks can sometimes be seen as a waste of time. There are 120 angels, but it's mostly following the 80-20 rule, where 20% are highly active and invest 80% of the funds. Less experienced angels need confirmation from the senior angels before jumping onto a deal. "Angels here aren't tech investors, so there's very much of a herd mentality. You need to get one big guy to buy in, then the rest follows, otherwise they are very hesitant," said an anonymous entrepreneur in Kitchener.

Furthermore, many entrepreneurs comment that even if you do convince some of the angel network to invest, it's often not enough. One source said, "you can't get a valuation higher than $2 million. The investor community in Waterloo is particularly bad at giving low valuations. Doesn't matter what company."

John Ruffolo, CEO at Omers Ventures, noted that some of the challenges for the region lie in the fact that there are no local sources of VC so they need to rely on other places in Canada and the U.S. He admits that the ecosystem is still quite successful, but having local firms on the ground helps a lot. It's not just the location of

VCs that are the issue though. “Basically there’s only two VCs in Canada that do Series B and later: us and one other,” said Ruffolo.

Many Silicon Valley investors have their eyes on startups from Waterloo. “When we come across a startup from Waterloo we pay extra attention,” said Kevin Carter, a Silicon Valley investor. However, Waterloo’s distance and the fact that investors won’t be able to give it the same level of attention and support sometimes leads Silicon Valley VCs to discount Waterloo startups and only invest in the very best ones.

Jon Sakoda, Partner at New Enterprise Associates, who has invested in the later-stage Waterloo startup Desire2Learn, expressed a similar viewpoint: “Great late-stage businesses are valued based on fundamentals, and location doesn’t factor into attractiveness or valuation as much as one may think. On the other hand, smaller companies require a lot of hands-on work and most VCs are much more cautious about investing in a startup in a remote location.”

Kevin Carter, General Partner at SV Angel, also commented on this key weakness: “Waterloo is remote. The location is a double-edged issue. Waterloo provides a good sense of community, but it’s far away from the Valley. It’s tough to get out there. I try to make a trip out there once a year, but it’s hard.” Carter noted that “SV Angels prefer to have their portfolio companies closer,” but it’s not that crucial, partly because they don’t take board seats.

> “Waterloo provides a good sense of community, but it’s far away from the Valley. It’s tough to get out there”

Talent

Impressively, every Silicon Valley VC partner interviewed rated Waterloo’s technical talent as being among the top three to five in North America, if not higher.

> “Something is going on in Waterloo, because the applications we get from Waterloo students are better than those we get from students of any other university.” — Paul Graham, Y Combinator

Carter continued: “One of the best aspects of Waterloo is the University of Waterloo co-op program. This is super valuable because students spend a really long time getting real work experience at several companies before they graduate. Anyone who’s had one of those interns will say that it’s really valuable. The co-op program produces some of the most capable college students coming out of undergrad.” He hasn’t seen any other school provide this type of hands-on real work experience.

For this reason, Carter is especially excited about Waterloo and has invested in approximately 10-15 companies in the region. His firm is also forging relationships with the team at Velocity, the Dean of Engineering at Waterloo University, and Communitech.

John Ruffolo mentioned one of the key challenges for revenue growth in Waterloo is the lack of sales and marketing talent. “As you start steering the business into sales and marketing, the pool is limited. You need to rely on labor pools in large neighboring cities, in Canada and the U.S., unlike in the Valley where you have every role you need to scale a company. We don’t have that in Waterloo,” he said.

Others have mentioned that hiring for talent has become highly competitive for Waterloo companies, and while there is an abundance of talent in nearby Toronto, the cities are not sufficiently connected.

> “It’s starting to get competitive for companies here to hire talent. There is a lot of talent in Toronto but not enough connection between the two cities.” —Mike Stork

3.3.3 Policymaker Perspective

The overall opinion of policymakers in the Province of Ontario is that they want to partner and support startup initiatives and know that it is better to provide the appropriate funds to local entrepreneur organizations, then take more of a hands-off approach and focus on networking these organizations together so they can share best practices.

“We need to let the local business leaders design and implement new strategic initiatives that create the highest possible impact for the entrepreneurial community,” said one senior Waterloo government official.

Based on Compass’ Global Startup Ecosystem Ranking 2015[2] and Startup Ecosystem Report 2012[3], Ontario seems to have lost ground with Toronto, sliding 9 positions and Waterloo slipping out of the top 20 (although mainly due to a change in methodology). Government officials are confident they can address weaknesses, adopt global best practices, and regain the lost ground.

2 For more information see Compass’ Global Startup Ecosystem Ranking 2015 at http://startup-ecosystem.compass.co/ser2015/

3 For more information see Compass’ Startup Ecosystem Report 2012 at http://blog.compass.co/pages/entrepreneurship-ecosystem-report

Currently, the Ontario Government is supporting a number of entrepreneurial programs with the most prominent support for the Entrepreneurs in Residence program and MaRS Market Intelligence. The Entrepreneurs in Residence program invites high-level entrepreneurs to make themselves accessible and provide hands-on mentorship for startups in the Communitech network for a limited time period. The MaRS Market Intelligence program offers access to the best market intelligence in the world—curated to specific needs, with no limit and at no cost for qualifying startups.

The government has also contributed a significant amount of money to get innovation centers like Communitech off the ground (including allocating $25 million over five years to the Communitech Hub building).

Talent

The Ontario government recognizes the importance of colleges and universities in the development of an entrepreneurial mindset in Canada and has acted accordingly.

Prior to launching the Campus-linked Accelerator Program and other youth entrepreneurship programs, representatives from the Ontario government undertook an extensive review of global best practices to develop an aggressive strategy to build entrepreneurship support infrastructure across all of its post-secondary institutions. Early results indicate the strategy has been successful, with 95% of the province's institutions embracing entrepreneurship programs.

The Ontario Network of Entrepreneurs helps post-secondary students launch and grow new businesses, supports SMBs (SMEs), and helps early stage technology-based startups through an extensive range of services.

One government official noted that a main challenge to the Waterloo community is the lack of aggressive sales people. "It's a very Canadian thing. We are not as aggressive as Americans in the market place." Communitech is working to address this with new programs and initiatives, and will hopefully be increasing the number of qualified sales people in the area over time.

> "It's a very Canadian thing. We are not as aggressive as Americans in the market place"

One interviewee added that some of the weak sales and export performance could be addressed by looking in Ontario's own backyard to create better networks that connect Canadian immigrants with startup opportunities. "We have one of the most diverse cultures in the world in terms of immigrant populations. Many of the immigrant business communities are very organized, but we haven't built the necessary linkages with these organizations to help our startups hire immigrants. So many simple things that we just aren't doing. Immigrants often have linkages back to their home countries that could help our startups expand exports. This could be a quick win for our startups."

The Ontario government certainly has identified U.S. commercialization as a key area where helping startups would have an important impact. While provincial budgets are tight, the motivation to work with Communitech and others to fund commercialization initiatives is real.

Training a sales team, creating a soft landing program in external markets, and connecting startups to potential corporate customers are current actions all being run by Communitech. However, a more cohesive "scale up" strategy backed by the Ontario government could expand these initiatives to help companies across Waterloo Region (and the province) scale more effectively.

The Waterloo Region has set an ambitious target to help build 15 high tech firms with $100 million in revenue by 2025. One of its government officials said, "It will require government, business, and community leaders to come together to make this happen. We applaud Communitech for having a bold vision for its startup ecosystem."

Ecosystem Assessment

4

This section is dedicated to analyzing and benchmarking Waterloo's startup ecosystem against the world's leading ecosystems. It builds on the voluminous research leading to the publication of the Global Startup Ecosystem Ranking 2015[1], a collaborative effort involving:

- Insights from over 200 interviews with entrepreneurs, investors and experts from 25 countries
- Data from 11,000 startup surveys completed from January to June 2015
- Insights and data from content partners from 20+ countries including: Deloitte, CrunchBase, Global Entrepreneurship Network, Orb Intelligence, Dealroom, and many other incubators, accelerators, VCs, policy makers, and academics
- Support from Ron Berman at Wharton Business School, Dr. Thomas Funke from the German Federal Ministry for Economics, and Steve Blank, a Silicon Valley serial-entrepreneur and academic.

While local experts are well aware of most challenges the ecosystem is currently facing, this section strives to go further into the identification of the relative strengths and weaknesses of the Waterloo startup ecosystem from a global competitiveness perspective, using the power of analytics.

What Compass brings to the table is deep qualitative and quantitative knowledge on the top 30+ global ecosystems, and years of experience in analyzing their specific strengths and weaknesses as well as benchmarking them. We also have spoken to additional entrepreneurs, investors, government officials, and other stakeholders of the Waterloo startup ecosystem to put our data into perspective.

1 See Compass' Global Startup Ecosystem Ranking 2015 at http://startup-ecosystem.compass.co/ser2015/

As established in the recently released Global Startup Ecosystem Ranking 2015[6], the following five components are essential when analyzing startup ecosystems: Performance, Funding, Talent, Market Reach, and Startup Experience. A detailed breakdown of the methodology can be found in the global report's methodology section. In short, the indexes have been defined as follows:

Ecosystem Performance
Performance is based on Ecosystem Value (sum of startup valuations at funding events and exits), the number of startups in the ecosystem (Startup Output), and startup performance measured by valuation growth over time.

Funding
The Funding index measures the availability of venture capital, as captured by the total amount of VC investments in an ecosystem, its distribution across the different rounds, average and median amounts by round, and time required to raise a round.

Talent
Talent consists of several variables measuring the quality, availability, and the cost of technical talent available to startup founders.

Market Reach
Market Reach is defined by the ability to access early customers in an ecosystem's local and/or culturally similar markets, as well as the ability to reach foreign customers to grow globally.

Startup Experience
Startup Experience captures the experience available to startups in the form of experienced advisors, employees with prior experience in a startup, founders with experience in a hypergrowth startup, and the incentive compensation offered to and valued by employees.

Policy
In addition to the above five components of the Global Startup Ecosystem Ranking 2015, the political environment of Waterloo has been examined as well. This analysis is based on qualitative interviews with governmental and non-governmental leaders and research performed by the following partner organizations: Global Entrepreneurship Network, The Global Entrepreneurship and Development Institute, and CITIE[2], the public policy project of Nesta, Accenture, and Future Cities.

The performance of Waterloo will be compared to a number of ecosystems: ones that share the Canadian context (Montreal, Toronto, and Vancouver); the global top four ecosystems—Silicon Valley (often considered to be in a class of its own), then New York, L.A., and Boston representing a more achievable target; and other top ecosystems with a smaller population, both inside and outside the U.S. such as Austin and Tel Aviv. Occasionally we compare Waterloo to Berlin as a high-performance European ecosystem. All of these ecosystems have demonstrated outstanding competitiveness in the Global Startup Ecosystem Ranking 2015, as indicated in Figure 5 on the following page.

The comparison with Tel Aviv is particularly insightful because, like Waterloo, its ecosystem is located outside the U.S. and has a significantly smaller population and market, yet is consistently ranked as one of the world's top five ecosystems.

2 Nesta, Accenture, and Future Cities Catapult. (2015). City Initiatives for Technology, Innovation and Entrepreneurship - A Resource for City Leadership.

Figure 5. **The Global Top 20 Startup Ecosystem Ranking**

	Ranking		Performance	Funding	Market Reach	Talent	Startup Exp.	Growth Index
Silicon Valley	**1**	◂	1	1	4	1	1	2.1
New York City	**2**	▲ 3	2	2	1	9	4	1.8
Los Angeles	**3**	◂	4	4	2	10	5	1.8
Boston	**4**	▲ 2	3	3	7	12	7	2.7
Tel Aviv	**5**	▼ 3	6	5	13	3	6	2.9
London	**6**	▲ 1	5	10	3	7	13	3.3
Chicago	**7**	▲ 3	8	12	5	11	14	2.8
Seattle	**8**	▼ 4	12	11	12	4	3	2.1
Berlin	**9**	▲ 6	7	8	19	8	8	10
Singapore	**10**	▲ 7	11	9	9	20	9	1.9
Paris	**11**	◂	13	13	6	16	15	1.3
Sao Paulo	**12**	▲ 1	9	7	11	19	19	3.5
Moscow	**13**	▲ 1	17	15	8	2	20	1.0
Austin	**14**	NEW	16	14	18	5	2	1.9
Bangalore	**15**	▲ 4	10	6	20	17	12	4.9
Sydney	**16**	▼ 4	20	16	17	6	10	1.1
Toronto	**17**	▼ 9	14	18	14	15	18	1.3
Vancouver	**18**	▼ 9	18	19	15	14	11	1.2
Amsterdam	**19**	NEW	15	20	10	18	16	3.0
Montreal	**20**	NEW	19	17	16	13	17	1.5

4.1 Performance and Lifecycle

Methodology

As discussed in the *Global Startup Ecosystem Ranking 2015*[3], when it comes to ecosystem performance, bigger is better. The Compass model showed a very positive relationship between the abundance and quality of key resources in an ecosystem (e.g. Funding and Talent) and ecosystem performance. A few factors support this principle.

First, in the world of startups, where there is limited time and money to attract top resources, the presence of a larger pool of local resources makes it both easier and faster to secure those resources.

Secondly, a larger city has more consumers and business customers, making it easier for startups to connect with them, understand their needs, and attract them as customers and partners. Big cities are also attractive to younger founders who like to have their living environment be as stimulating as their work. This explains the movement of startups from suburbs to city centers in London, New York, and San Francisco.

Thirdly, reinforcing this principle, the main stakeholders of a startup ecosystem—entrepreneurs, investors, and talent—decide where to locate their company based on indications of an abundance of resources and past successes.

3 See the Methodology section of Compass' Global Startup Ecosystem Ranking 2015 at http://startup-ecosystem.compass.co/ser2015/

The analysis showed that the larger and more frequent the exits and funding events, and the higher the presence of capital and quality talent (both technical and non technical), the more an ecosystem attracts entrepreneurs and investors from other locations. This behavior is further confirmed by expert interviews and past experience.

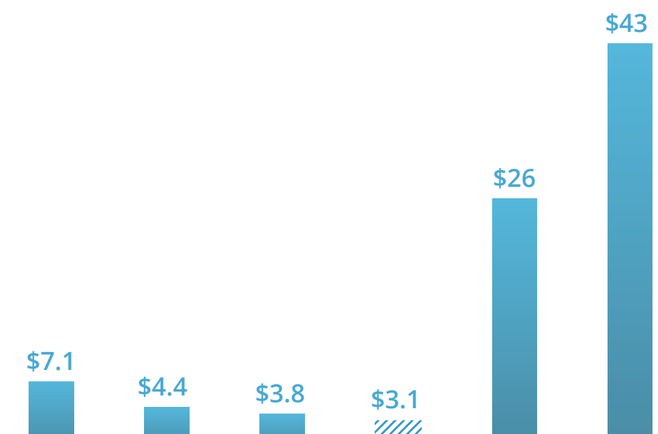
The performance of an ecosystem is therefore measured by the total value created by its startups and the number of startups it created—which are respectively called "Ecosystem Value" and "Startup Output". More specifically, Ecosystem Value is defined by the sum of its exit valuations ("Exit Value") plus the sum of the valuations of all its pre-exit startups at their latest funding event, both between January 2013 and March 2015. While Exit Value is often considered a lagging performance indicator, the valuation of pre-exit startups clearly captures the ongoing performance of an ecosystem.

High valuations and large exits are also important because they are indicators of job creation. Quoting GERN, "Entrepreneurship policy targets economic growth, and [High Growth Firms] over-deliver. HGFs have been found to disproportionately account for net job creation (>50%), even though they represent a small fraction of the active firms (<5%), a result proven in a variety of countries and settings."[4] George Foster, Professor of Management at Stanford University, found in his research that "among five-year-old firms, the top-performing 10% provide roughly 80% of gross revenue and job creation".[5]

4 GERN (2105). Defining High Growth Firms: Is all growth the same? Retrieved Sept. 14, 2015 from http://gern.co/defining-high-growth-firms-is-all-growth-the-same/

5 Stanford Graduate School of Business (2015). George Foster: Are Startups Really Job Engines? Retrieved Sept. 14, 2015 from http://www.gsb.stanford.edu/insights/george-foster-are-startups-really-job-engines

Figure 6. **Ecosystem Value (in billion USD)**

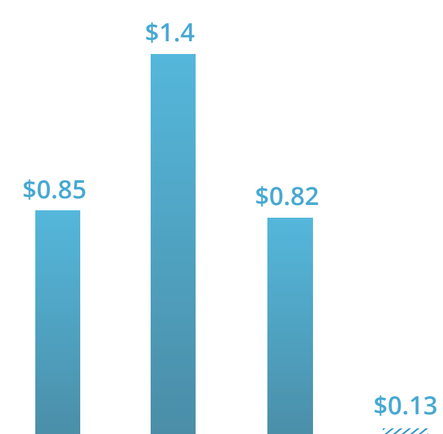


Ecosystem Value

Waterloo's Ecosystem Value is between $2.8 and $3.4 billion, comprised of $130 million in Exit Value and between $2.7 billion and $3.3 billion in pre-exit startup valuations. This ranks Waterloo between the 26th and 30th position globally in terms of Ecosystem Value. Note that this Ecosystem Value does not include the recent $1 billion valuation obtained by Kik.com in August 2015 because any liquidity and funding event that took place after March 31st 2015 was not included for any other ecosystem in the report. However, adding this large funding event would only move Waterloo two positions higher in the global ranking.

The Exit Values of Toronto and Montreal are more than six times larger than that of Waterloo. Nevertheless, the overall weak exit performance of all Canadian startup ecosystems is considered their Achilles' heel. This observation is illustrated by the fact that the Exit

Figure 7. **Total Ecosystem Exit Values (in billion USD)**



Value of L.A. alone, at around $18 billion, is six times higher than the cumulative sum of Waterloo, Toronto, Vancouver, and Montreal altogether ($3 billion).

Exit Value has a direct impact on the future performance of an ecosystem by acting as the number one trigger of attraction for angel investors, experienced management, and technical talent. It's also important to note that after an exit human resources are freed up, while capital is both freed up and multiplied. Therefore, because of the limited number of Waterloo-based exits, much of their local angel investors' capital remains tied up in older investments, rendering them unable to invest in newer startups. Highlighting this issue, several experts have noted that angel investors who have been active in the region for five years or more are starting to run out of capital to invest. This can have a significant dampening effect on an ecosystem's growth.

Waterloo's Ecosystem Value is between $2.8 and $3.4 billion

It is interesting to note that Waterloo's Exit Value accounts for only 4.1% of its Ecosystem Value, the lowest proportion among all of the top 35 ecosystems. In some circumstances, this could be a good sign, as a lower percentage can indicate a younger, faster growing ecosystem that is about to generate an increasing number of exits. However, as discussed previously, in this case it is directly related to the relative lack of exits endemic across Canada. The country is one of only three where Exit Value in its top ecosystems has not rapidly grown from 2013 to 2014. This is in contrast to top U.S. ecosystems which had a 41% growth in Exit Value, and Europe, with a 368% growth in Exit Value.

Startup Performance

Another lens that can provide insights into an ecosystem's startup performance is how the valuation of its startups grows over time. Figure 8 shows the linear regression trend lines capturing the growth in startup funding valuations over time for selected ecosystems, while Figure 9 shows the same for startup exit valuations. Exit valuations are always much higher because they capture the valuations of the most successful startups only—those that had a successful exit—whereas funding valuations include both low and high performance startups.

Looking at funding valuations at year five, Silicon Valley's trend line has reached $210 million, as compared to $140 million for the top teo to four (New York, L.A., and Boston) and less than $80 million for Canadian startups. Exit valuations tell the same story. The small number of Canadian exits makes exit valuations less

Figure 8. Funding Valuations Over Time (Series A and later)

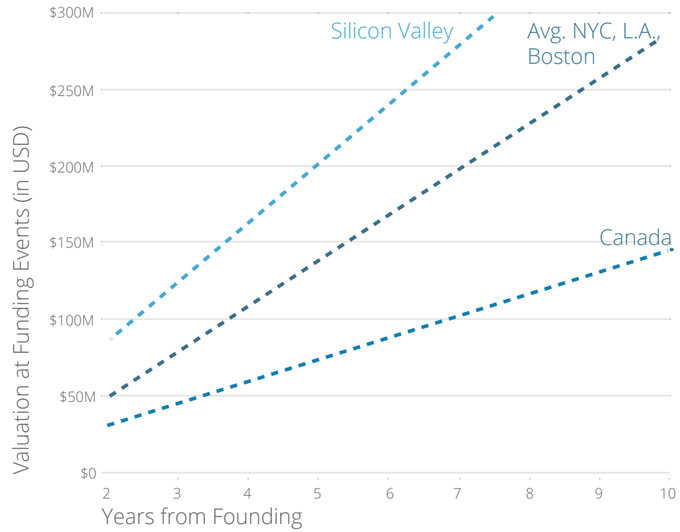
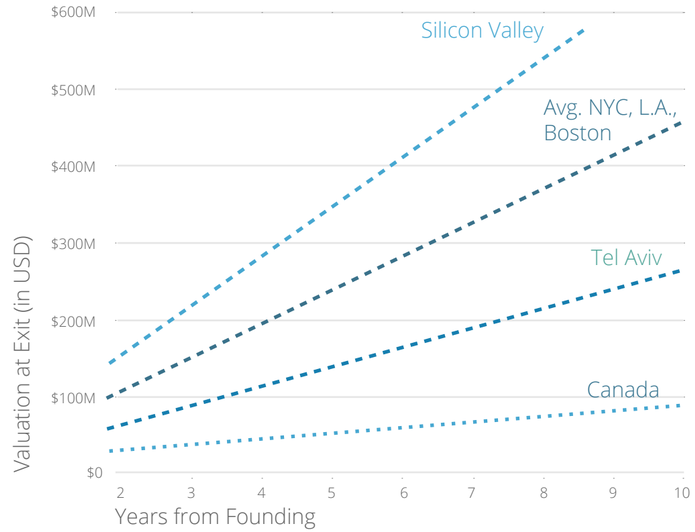


Figure 9. Exit Valuations Over Time



statistically significant than funding valuations, however, given the lack of exits above $500 million in Canada as compared to the many such exits that have occurred in each of the top four U.S. ecosystems, the data speaks for itself.

By comparison, Tel Aviv, a top ecosystem also with a smaller population and outside of the U.S., provides an additional perspective. While this is not possible for valuation growth at funding events because of the small number of data points available, it is possible for valuation growth at exit. Tel Aviv's exit trend line tells a similar story, growing much faster than Canada's trend line. In addition, Tel Aviv's data includes some exits valued at $500 million or more.

A pertinent question is then: why is it a problem that the value of Waterloo startups grows slower than startups in top ecosystems? Can't valuations grow slowly, yet produce very large, billion-dollar exits or unicorns? Isn't an ecosystem's Exit Value also a factor of the ambition of entrepreneurs, or a factor of culture and individual goals? One theory is that ecosystems like Waterloo, Montreal, and Toronto lack unicorns because founders sell early, being satisfied with a $100 million or $500 million exit. A related factor to consider is self-selection. Entrepreneurs who want to create a unicorn choose Silicon Valley, and therefore Silicon Valley has a higher concentration of entrepreneurs with very high ambitions. Another hypothesis is that Canadian entrepreneurs choose to exit earlier than entrepreneurs in Silicon Valley because they feel they lack the know-how to scale a company from $100 million to $1 billion, and the risk it represents doesn't seem worth it.

The slower valuation growth of Waterloo startups combined with the structure of venture capital markets suggest an alternative explanation. VC funds are structured around a cycle of about

seven years; they need to return liquidities to their investors in a reasonable time frame based on that expected cycle. Once a startup is six to eight years old, there is significant pressure from investors and the board to drive a liquidity event. The ambition of the founders is a factor, however, by this time they have often lost control of shareholder and board votes, and they are often no longer the CEO of the corporation. 55% of startups in our data set have exited before the end of year seven, and 80% before the end of year 10. Because of the structure of venture capital financing, a slower valuation growth means a lower value has been achieved by the time pressure to exit mounts. This may well be the key factor explaining the lower value exits of an ecosystem.

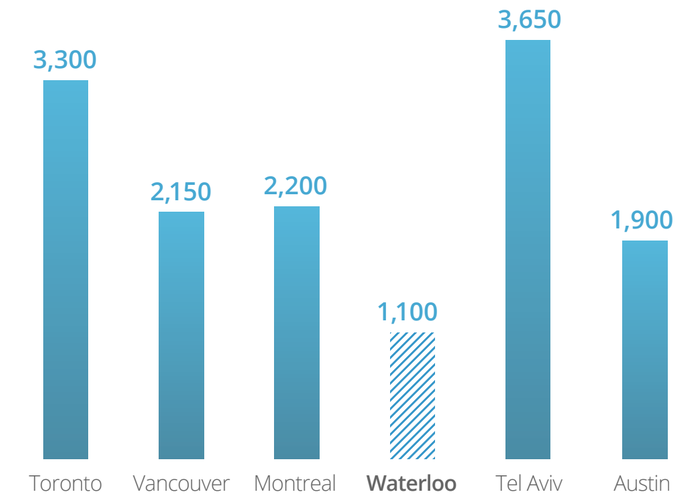
In conclusion, it is clear that the valuation of startups in top Canadian ecosystems grows much slower than those of top U.S. ecosystems and that of Tel Aviv's. Given the performance of Tel Aviv startups, the cause for this lag does not seem to be a small local or national market size. The questions surrounding valuation growth will be revisited in the Market Reach section when revenue growth rates are examined.

Startup Output

The number of tech startups in each ecosystem was estimated with the help of more than 60 partners and local lists of startups provided for each ecosystem.

Compass' estimate for the Waterloo Region is about 1,100 tech startups, while Communitech's estimate is a little higher. The methodology takes into account the fact that many Waterloo startups move their headquarters to the U.S. either temporarily or permanently, thereby reducing the size of the local ecosystem.

Figure 10. **Startup Output**

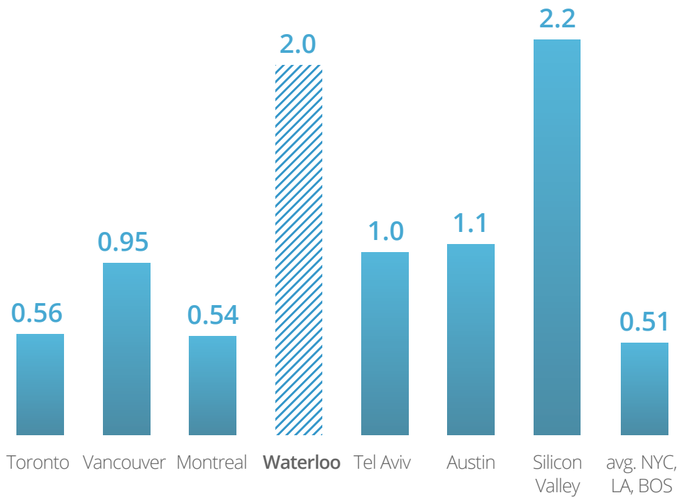


This number of startups positions Waterloo in the range of the 31st to 35th largest ecosystem in the world. This is an impressive number when one considers the small population of the Waterloo Region.

In fact, in terms of Startup Density (defined as the number of tech startups per thousand people), Waterloo is second only to Silicon Valley and the only other ecosystem with a Startup Density above 2.0 (Silicon Valley is 2.19). This is particularly impressive given that the next ecosystems on the list of Startup Density are Dublin, Austin, Tel Aviv, and Vancouver with 1 to 1.3 startups per thousand—no more than two-thirds the density of Silicon Valley and Waterloo.

From an economic perspective, this speaks to the incredible productivity of Waterloo's population in terms of creating innovative

Figure 11. **Startup Density**



tech startups. It also underlines the strong entrepreneurial culture of Waterloo. The recently published Global Entrepreneurship Index 2015 by GEDI[6] shows that entrepreNeurship is not only trending in Waterloo, but throughout Canada, ranking it as the second most entrepreneurial country in the world.

This world-class level of Startup Density and innovation productivity can be credited to the Waterloo Region's excellent institutions of higher education and its collaborative startup community, spearheaded by Communitech. The collaboration, networking, mentorship, and other activities fostered by Communitech and other stakeholders lead to accelerated learning and startup development.

6 GEDI Global Entrepreneurship Index 2015

Growth Index

The Growth Index captures the relative pace of develpoment of an ecosystem over the past two years on a 10-point scale. It is based on the following three indicators: the annual growth in the number of startups, the 2013-2014 growth in VC investments and the two-year moving average growth in Exit Value.

With a Growth Index of 2.4 Waterloo is the fastest growing startup ecosystem in Canada and the third fastest among North America's top ecosystems. Thanks to a faster growth in number of startups and a 97% growth in total venture capital invested (and despite a 50% drop in Exit Value[7]) Waterloo grew much faster than Toronto, Vancouver, and Montreal which had Growth Indexes of 1.3, 1.2, and 1.6, respectively. Within the United States, only Chicago (2.8) and Boston (2.7) had higher Growth Indexes.

Ecosystem Lifecycle

According to the ecosystem lifecycle model described in Section 2 (see Figure 1), Waterloo's Growth and Attraction Indexes suggest it has reached the Maturity Phase. More specifically, it is higher than most mature ecosystems, falling in the upper end of that quadrant in terms of Growth Index and in the "Regional & National" Attraction section.

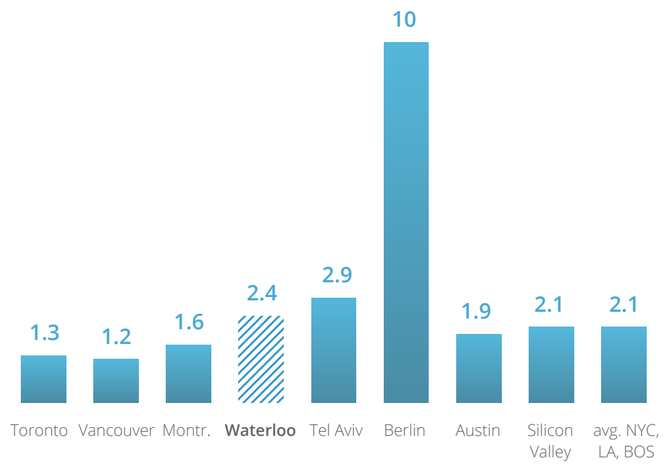
Waterloo's Growth Index of 2.45 is only exceeded by two of the top 20 North American ecosystems because most top 20 ecosystems are large and mature. Waterloo's growth is only slightly above the global average Growth Index of 2.35.

Waterloo has not attracted any foreign startups or foreign institutional investors to move to the ecosystem, and only a few Canadian startups have moved to Waterloo. International attraction of resources is what confers the power to accelerate, or even multiply, the growth rate of an ecosystem.

However, Waterloo's availability of top talent is such that it ranks fifth among ecosystems studied in term of the absolute number of startups and larger tech companies (including Google) that have opened a secondary R&D office within its boundaries.

It is in fact in a class of its own in Canada for its attraction of secondary offices from international startups and tech companies, and is only surpassed by Montreal in its level of attraction within national boundaries. Unfortunately this type of attraction does not have a direct impact on growth because external entities primarily come to take advantage of existing ecosystem resources rather than importing external resources to it.

Figure 12. Ecosystem Growth Index (0-10)



7 2013-2014 based on a 2-year moving average

4.2 Funding

The purpose of this section is to answer the key questions of whether startups have access to the right amount of funding at the right time and cost (dilution) at each stage of a startup's development.

From a global ranking perspective Waterloo ranks #25 for Funding. Its venture capital investments of $241 million ($266.5 million CAD) ranked it among the top 30 ecosystems globally, while its time-to-raise was slightly slower than average, yet still ranking it among the top 15.

Percentage of Funding Rounds with at least one Foreign Investor

This metric can be useful when comparing ecosystems within one specific country, but not between countries because the larger the country, the lower this percentage. When benchmarking a nation's different ecosystems, having a higher percentage of funding rounds that include a foreign investor generally indicates a relative gap in local funding. 40% of Waterloo's funding rounds include a foreign investor, compared to 21% for Montreal, 22% for Vancouver, and 31% for Toronto. This suggests a local funding gap exits in Waterloo.

Amount of Early-Stage Funding per Startup

Another broad indicator that can indicate a general gap in funding is the sum of seed, Series A, and Series B investments—those that greatly depend on local rather than global investors—divided by the total number of startups in the ecosystem. The numbers are adjusted to correct for the different penetration of CrunchBase in each ecosystem. Keeping Waterloo's oversized Series B round ($85 million) to Desire2Learn out of the analysis because it took place 15 years after the company's founding and is akin to a later-stage round, the results are dramatic. Waterloo's has about $45,000 in early-stage funding per startup, compared to almost $70,000 for Vancouver and Toronto, $490,000 for Silicon Valley, and about $360,000 as the average for New York, Los Angeles, and Boston. Clearly, Waterloo and Canadian startup ecosystems have a large local funding gap. (Note that Montreal was excluded from this and the following analyses due to lack of data.)

Figure 13. **Funding Rounds with at least one Foreign Investor**

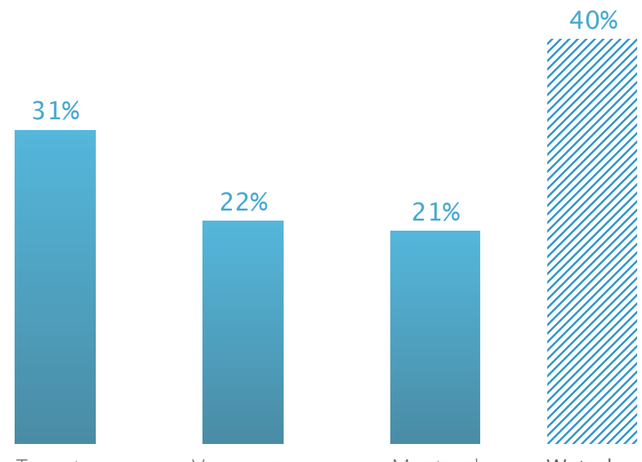
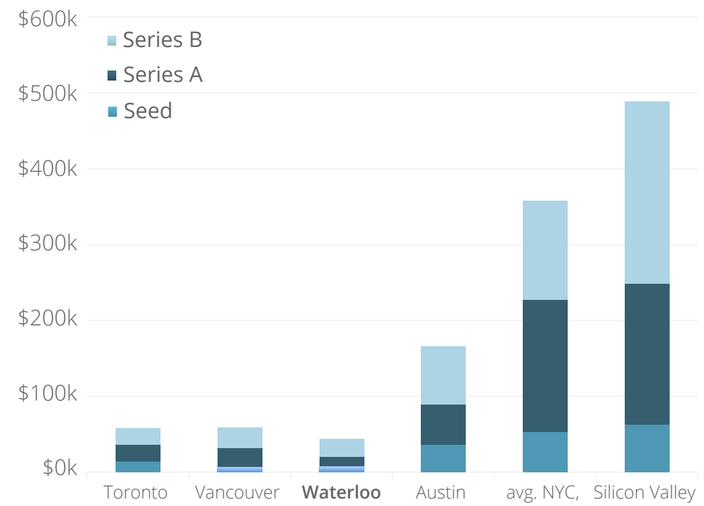


Figure 14. **Early-Stage Funding (Seed to Series B) per Startup**



Distribution of Funding Across Rounds

Looking at the distribution of VC investments by value across funding rounds from seed to Series D+ (Figure 15), and comparing Waterloo and other Canadian ecosystems to the top U.S. ecosystems, it is noticeable that Waterloo has lower proportions of capital going to Series A, B, and D+ rounds, but this is clearly due to an extraordinary proportion going to Series C (an effect confirmed by Figure 16). Toronto and Vancouver show similar issues, each with extraordinary proportions of capital going to Series C or D+.

The overall distribution of VC investments by number of deals across funding rounds from seed to Series D+ (Figure 16) is quite normal for Waterloo, except for a lower proportion of Series D+ rounds. Toronto and Vancouver show a higher proportion seed rounds at the detriment of Series A for Toronto and Series A and D+ for Vancouver.

As mentioned earlier, local venture capital markets are a critical factor from seed to Series B. For Series C and later, venture capital firms from all over the world compete to invest in the best performing startups as they grow closer and closer to an exit. For this reason the low proportion of VC investments in Canadian ecosystems going to Series D+ indicates that a small number of local startups reach this late stage, rather than being indicative of a local funding gap.

Figure 15. Distribution of Venture Investments by Value (Seed to Series D+)

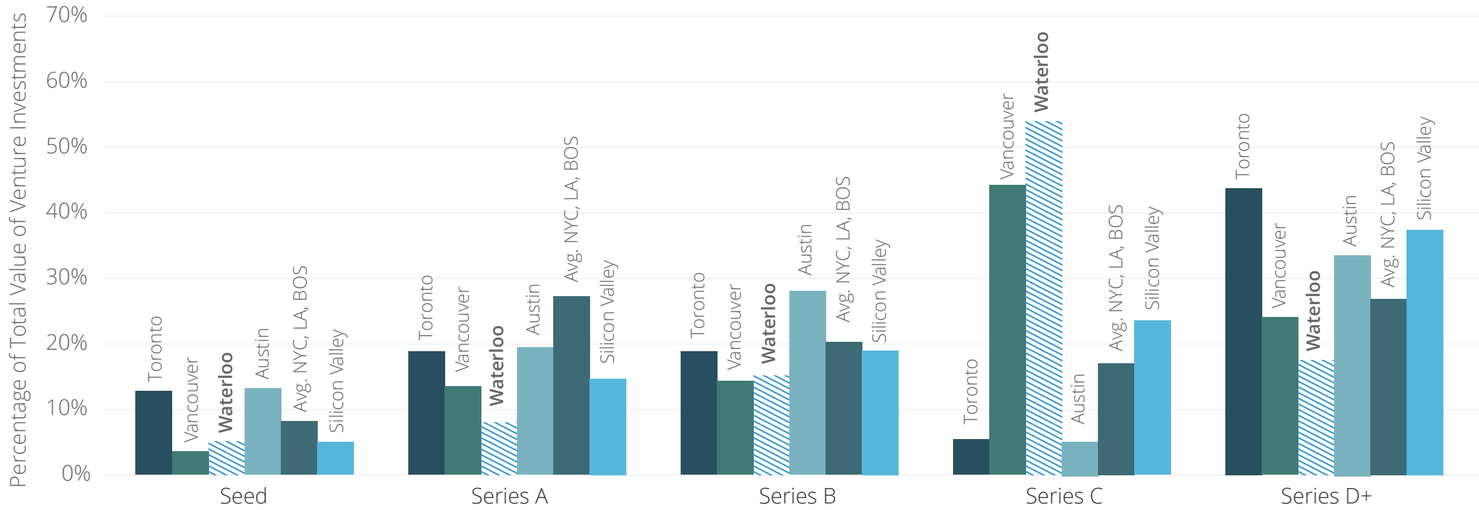
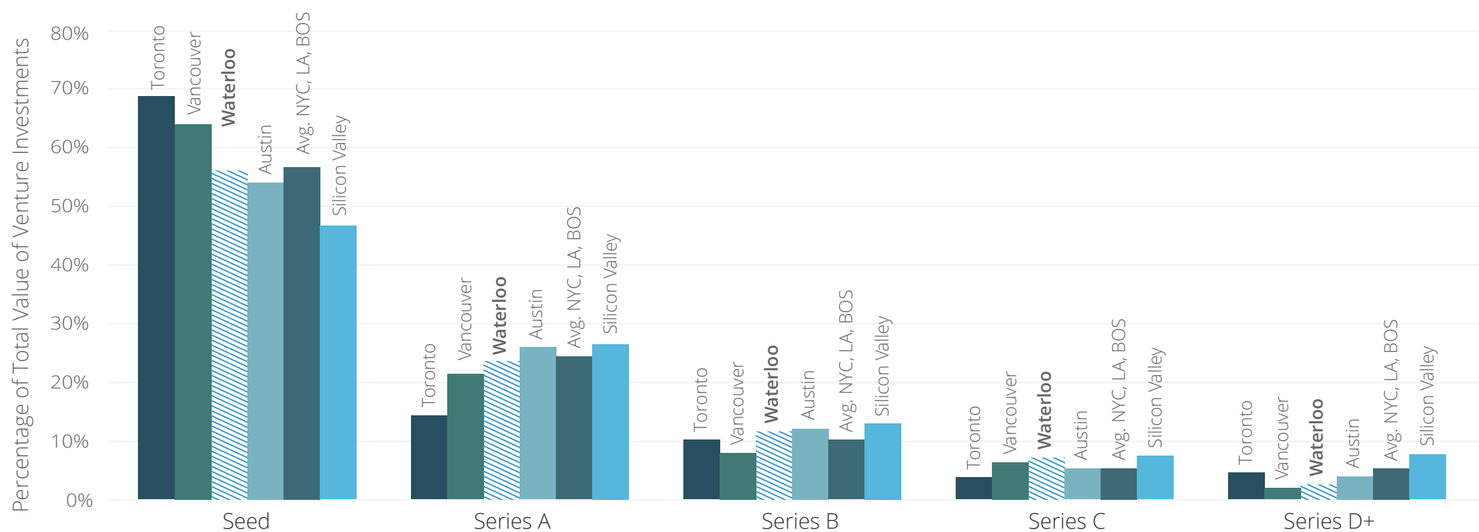


Figure 16. Distribution of Venture Investments by Number (Seed to Series D+)



Digging deeper into Waterloo's data, Figure 17 shows the proportions of venture capital going to rounds seed to Series B. Waterloo has a lower proportion of Series A capital (10% lower than Silicon Valley and 21% lower than the average for New York, Los Angeles, and Boston), but a higher proportion of capital going to seed and Series B rounds. The proportion of capital allocated to seed rounds in Toronto is twice as high as in top U.S. ecosystems.

The distribution of VC investments by number of deals across funding rounds from seed to Series B (Figure 18)—a measure of attrition through early funding runs—shows that Waterloo's funnel is similar to that of top U.S. ecosystems. Toronto continues to have a higher proportion of seed rounds, clearly at the cost of Series A rounds, which account for half the proportion found in Silicon Valley.

This analysis can be misleading. While the relative distribution of capital and number of funding events across rounds in the Waterloo ecosystem is normal, it does not mean local startups receive sufficient capital, nor does it suggest whether or not there is a gap in local funding. The following analyses will allow clearer conclusions.

Figure 17. Adjusted Distribution of VC Investments by Value (Seed to Series B)

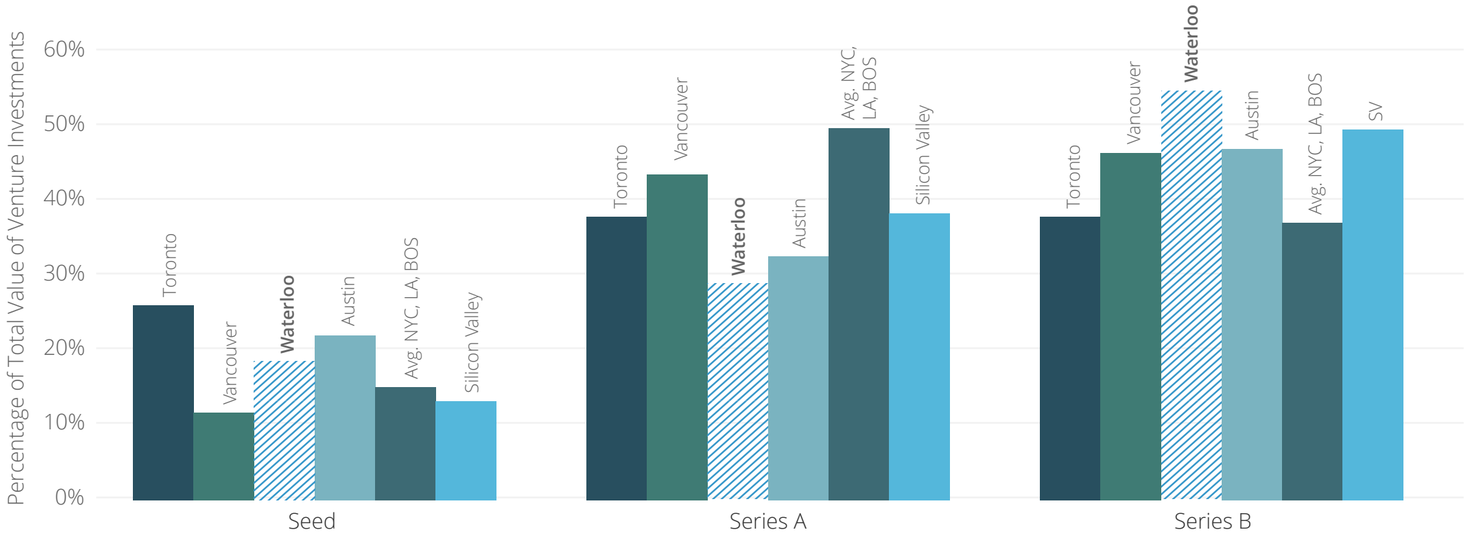
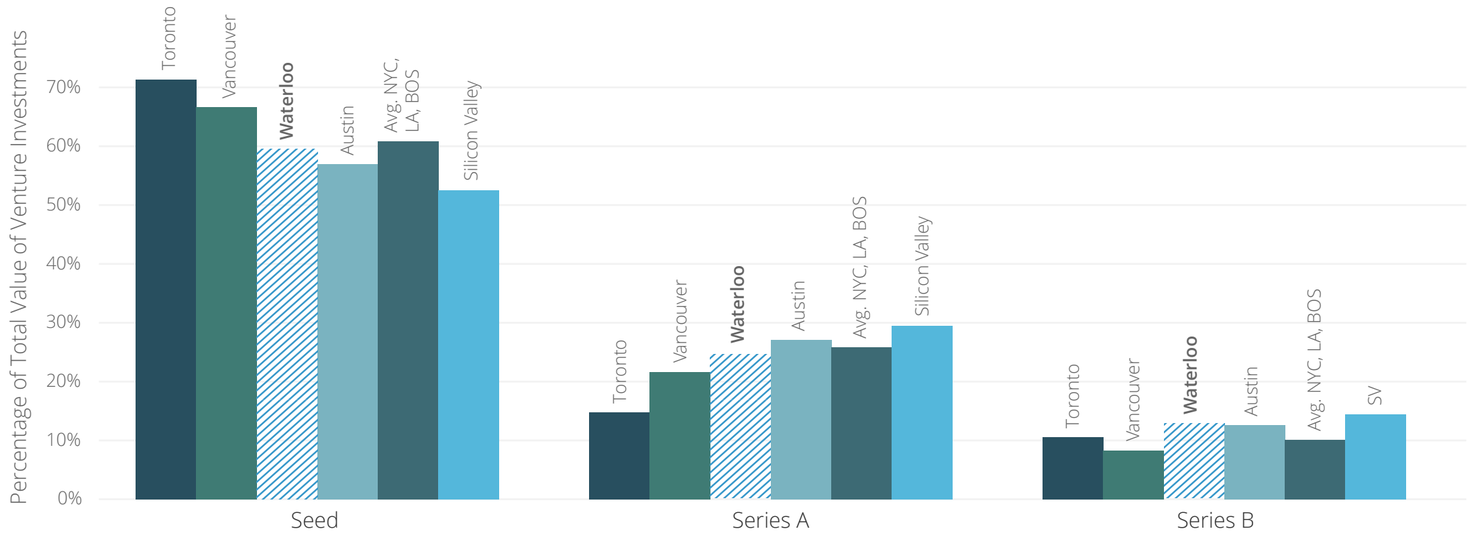


Figure 18. Distribution of Venture Investments by Number (Seed to Series B)



Seed Funding Amount

Examining the median amount for seed rounds, Waterloo startups raise $120,000 (median) as compared to $600,000 for those in the top four U.S. ecosystems. The top Canadian ecosystems of Montreal, Toronto, and Vancouver raise $300,000. Waterloo startups close an average of 1.5 seed rounds compared to 1.3 in Silicon Valley, New York City, Los Angeles, and Boston, exacerbating the median seed funding gap (0.5 x $120,000 < 0.3 x $500,000).

Average seed funding amounts for Waterloo ($695,000) and top Canadian ecosystems ($655,000) are closer to that of the top four U.S. ecosystems ($925,000). Combined with the analysis of medians, this confirms that while some Waterloo startups get an amount of seed funding similar to their counterparts in top U.S. ecosystems, the great majority of Waterloo startups face a funding gap.

Again, this analysis is focused on private investors. Adding government financing of sometimes more than $100,000 to seed rounds would increase the Canadian averages. However, some of this funding goes to industries other than tech, and inevitably some of the grants (or other forms of financing) go to different startups than those already funded by private investors. For this reason it is doubtful that government financing has the effect of closing this gap in seed funding amounts.

Considering the much lower cost of engineers in Waterloo (less than half of the U.S.), the median of $120,000 for seed rounds in Waterloo is equivalent to $240,000 in the U.S. However this still falls short—by more than 50%—of the $500,000 median for seed rounds in top U.S. ecosystems.

Series A Funding Amount

Median Series A amounts for Waterloo startups are exactly the same as for top U.S. ecosystems (Silicon Valley, New York, Los Angeles, and Boston) at $5 million. Interestingly, top Canadian ecosystems get even more than Waterloo and top U.S. ecosystems, with $5.35 million. However, the average Series A amount for Waterloo is significantly lower than the averages for the top three Canadian and the top four U.S. ecosystems, with $4.8 million, $6.7 million, and $7.2 million respectively.

This lower average amount combined with an equal median suggests most Waterloo startups get a similar, competitive amount of Series A funding as startups in top U.S. ecosystems, but the best startups in top U.S. ecosystems get significantly higher amounts of funding overall. However, given the much lower salaries and operational costs, Waterloo startups still get a runway similar to, if not longer than, startups in top U.S. ecosystems.

The issues specific to the local market for Series A funding in Waterloo and the top three Canadian ecosystems becomes clearer when examining the impact of foreign investors on Series A amounts. It turns out that startups in Waterloo get $2.5 million less if they raise a Series A with only local investors than if at least one foreign investor is part of the round. This further supports the significant gap in local Series A funding as compared to the top four U.S. ecosystems. Again, the 50% lower engineering salaries— as can be seen in section 4.4 Talent—and operational costs compensate for that difference.

Still these results beg the question as to whether startups get a higher amount of funding purely because U.S. investors write bigger Series A checks or because startups that attract U.S. investors are, by definition, the best performing startups and therefore get bigger checks.

Figure 19. Average Seed Funding Amounts (in thousand USD)

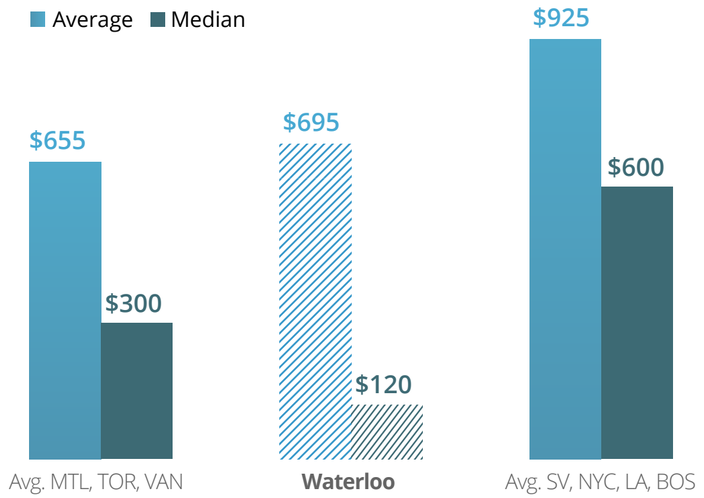
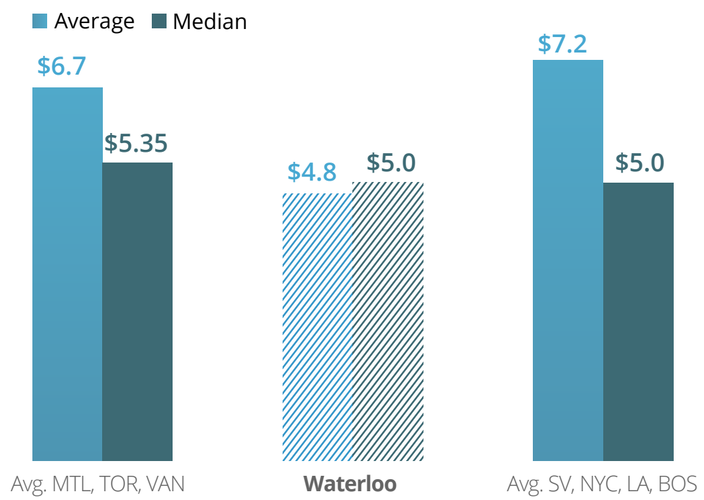


Figure 20. Average Series A Funding Amounts (in million USD)

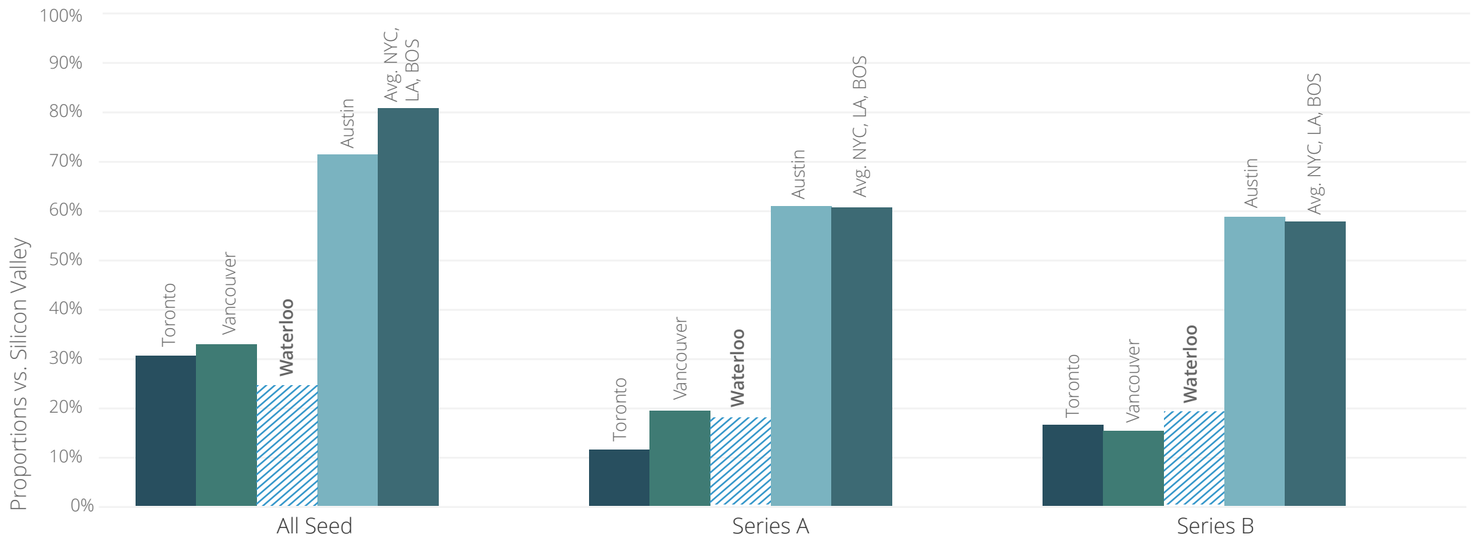


While the latter is true, the issue remains that top Canadian startups have to raise money in the U.S. to get the same amount of funding as U.S. startups in top ecosystems. If they don't, they get smaller amounts of funding from local Canadian VCs.

Matt Murphy, Partner at Menlo Ventures, explains: "There are many high-quality startups here [in Silicon Valley], so when you think about a decision to invest in a company outside of the country, the bar is higher because it will be harder. You don't have a local network to call upon to help them, you can't meet for a quick coffee to discuss an issue, you don't know local executive talent to add to the company, etc."

The funding gap motivates the best performing startups to seek higher amounts in the U.S., which in and of itself is a threat to Canadian ecosystems. The other, perhaps less obvious, problem is that potential returns on investment of local investors are negatively affected each time a higher-performing Canadian startup gets funded in the U.S. rather than in Canada. For this reason, even if the lower talent costs in Canadian ecosystems compensated fully for the funding gap in Series A amounts, top Canadian investors and ecosystems will greatly benefit from closing this funding gap. Furthermore, this may contribute to closing the gap in Canadian startups' valuation growth noted in the Performance section.

Figure 21. Startups Receiving Funding in Proportion to Silicon Valley



Series B Funding

The top Canadian ecosystems (Montreal, Toronto, and Vancouver) receive a median Series B amount of $10.5 million compared to $11 million for top four U.S. ecosystems. Adding Waterloo to the comparison, however, brings the median to $9.25 million; Waterloo draws the median significantly down. Since there were only five Series B financings in Waterloo in 2014, it is not possible to draw the conclusion that a significant gap exists. Because there are few Series B financings and their amounts vary widely, the median for one ecosystem cannot be treated as a reliable metric.

Proportion of Startups Receiving Funding

When the number of startups that receive financing at each round is compared with each ecosystem's Startup Output (total number of startups at all stages), it reveals that the Canadian capital markets of Waterloo, Toronto, and Vancouver fund a much smaller proportion of local startups than top U.S. ecosystems. Figure 21 shows the proportion of startups funded in different ecosystems compared to Silicon Valley (represented by 100%). Not surprisingly, Silicon Valley's more mature venture capital market allows for a higher proportion of startups receiving funding at each round. Other leading U.S. ecosystems are close to Silicon Valley for the seed round, with only around 20% fewer startups receiving funding, but thereafter the gap increases to 40% for Series A and 50% for Series B.

The Waterloo, Toronto, and Vancouver ecosystems fare a lot worse. Throughout all rounds the proportions of their startups getting funded represent a maximum of one-third of that for Silicon Valley. Waterloo's proportion of seed-funded startups is only one-fourth of Silicon Valley, while for Series A and B it is well below 20%. In other words, compared to Silicon Valley, three to five times fewer startups in top Canadian ecosystems received seed, Series A, and Series B funding. When compared to the average proportions for New York, Los Angeles, and Boston, about three times fewer Canadian and Waterloo startups receive funding at each round.

Note again that this analysis does not take into account government funding. However, considering the extent of the gap, it would be very surprising if it filled more than a fraction of this seed funding gap.

Austin's performance, close to the average for New York, Los Angeles, and Boston, confirms the lower proportion of seed funding events in those Canadian ecosystems is not inherent to smaller ecosystems.

These results contrast with expert statements (and data) saying that a) the quality of ideas coming from Waterloo is very good (some would even say they are better on average than in other ecosystems), b) the quality of technical talent is among the very best in North America, and c) engineer salaries are less than half that of the U.S. Yet much fewer startups secure seed and Series A funding. Clearly, all of this points to an important funding gap.

Such a gap has a variety of negative direct and indirect consequences on an ecosystem, such as impacting startup performance (e.g. revenue growth). Also—and this is a hypothesis—this gap may discourage serial entrepreneurship, as so many first-time founders work hard on a startup without making any money, only to fail at closing a seed round. Not surprisingly they focus next on finding a good paying job rather than try again. In top U.S. ecosystems three to four times more entrepreneurs get seed funding, with each of them more likely to found a second startup even if the first one failed. This hypothesis is supported by the much lower average age of founders and by interviews, both of which point to a much lower rate of second and third time entrepreneurs in Waterloo than in U.S. ecosystems.

Dilution

Examining dilution rates to see if Canadian startups received lower valuations in proportion to the amount invested in each round shows no statistically significant variation. This is in line with the report's findings during the analysis for the Global Startup Ecosystem Ranking 2015, which showed that average dilution rates vary little across ecosystems and continents. This suggests that, in general, global investors in mature ecosystems apply the funding model developed in Silicon Valley and the U.S.

Time to Raise

Based on the Compass survey, the time to raise a seed round in Waterloo is 40% longer than in the top four U.S. ecosystems. However, this difference is not considered statistically significant, nor can the absolute difference of 20 days make a big impact on the success of a startup.

Growth in VC Investments

Venture capital investments in Waterloo grew from $135.5 million in 2013 to $266.5 million in 2014 (97%). This rapid growth essentially matches the growth in top four and top 20 U.S. ecosystems (both at 96%). However, Waterloo's growth is remarkable when compared to the growth in top Canadian ecosystems (5% on average) and Austin (40%). Still, VC investments will need to continue to grow much faster than in top U.S. ecosystems in order to catch up to their funding amounts and the proportion of startups getting funding.

Conclusion

The Waterloo startup ecosystem suffers from a severe gap at the seed round level due to fewer active angel investors and limited capital available for new investments. This leads to much smaller seed rounds than in U.S. ecosystems and a shorter runway for startups, even after taking into account the much lower cost of engineering talent. The Series A funding gap is less severe and felt less acutely because the best Canadian startups have been able to compensate for the smaller number of local VC firms and their smaller investment amounts by going to the U.S. to secure better funding. More dramatic however, the proportion of Waterloo startups obtaining seed funding is three to four times lower than in the top four U.S. ecosystems and Austin. Because of a higher attrition rate from seed to Series A, three to five times fewer Waterloo startups obtain Series A funding than startups in top U.S. ecosystems and Austin.

This definitely has a negative impact on the number of successful exits, which, as seen in the Performance section, are rarer and of lower value than in top U.S. ecosystems.

4.3 Market Reach

After funding, the most important factor affecting an ecosystem performance is Market Reach. The Market Reach factor captures the ability of startups to grow—defined as the increase of active users, paying customers and/or revenue. Both research and modeling work has shown that the two key sub-factors are a) Local Market Reach—the size of the local economy and cultural markets a startup has access to and b) Global Market Reach—its ability to "go global" by growing beyond its national borders.

By extension, the assessment of issues that directly impact the rate or speed of revenue growth are assessed within this section. Why is revenue growth rate so important? As discussed in the Performance section, research shows that "High Growth Firms (HGFs) disproportionately account for net job creation (>50%), even though they represent a small fraction of the active firms (<5%)"[8] and that "among five-year-old firms, the top-performing 10% provide roughly 80% of gross revenue and job creation".[9]

In the case of Waterloo, its 26th to 30th rank in Market Reach in the 2015 Global Startup Ecosystem Ranking leaves no question as to the challenge its startups face around scaling.

For late stage startups past Series B, Market Reach is the most important factor influencing their performance. By deduction, because issues related to Local Market Reach cannot be "solved", Global Market Reach is their most important actionable factor.

8 Defining High Growth Firms: Is all growth the same?" Gern.com. Retrieved Sept. 14, 2015 from http://gern.co/defining-high-growth-firms-is-all-growth-the-same.

9 Foster, George. "Are Startups Really Job Engines?" Stanford Graduate School of Business. Retrieved Sept. 14, 2015 from http://www.gsb.stanford.edu/insights/george-foster-are-startups-really-job-engines.

For these reasons, considering the startup ecosystem of Waterloo Region with its much slower growth in funding and exit valuations and its lack of large exits and unicorns, Global Market Reach was suspect #1. Analysis has confirmed that Global Market Reach—the ability of Waterloo startups to grow globally, and more specifically, to grow into the U.S. market—is the biggest problem.

Local Market Reach

Within Local Market Reach, both local and cultural market sizes are important because they indicate the growth potential offered by markets that startups have easiest access to. An ecosystem's cultural markets include its local country, as well as countries with a common language where startups face relatively lower customer acquisition challenges due to language, similarities in work and personal culture, ease of understanding needs, and more.

When comparing the Local Market Reach of Waterloo's startup ecosystem with leading peers inside and outside of Canada, the analogy of David versus Goliath comes to mind. With a metropolitan GDP of around $28 billion, Waterloo's local market is only a quarter the size of Vancouver's and Austin's, and less than two-thirds the size of Bangalore's. Toronto's GDP is almost 10 times larger ($261 billion), while Silicon Valley is almost 20 times bigger.

It is important to note, however, that downtown Toronto is only 70 miles away from Waterloo, making it almost accessible as a local market. Almost but not quite, because startups usually congregate near the center of a large city, which places them near or at the doorstep of large corporate headquarters.

Having to drive 1.5 to 2 hours or take a 2.5 hour train ride to meet with customers comes at a cost. While distance is less of a material problem for B2C startups, throughout the analysis several signs suggested that being located in a large city yields an advantage.

Figure 22. **Metropolitan GDP (in billion USD)**

Waterloo-based startups are considered to be disadvantaged in terms of Local Market Reach, having relatively less access to large number of consumers and businesses (especially large enterprises) than startups in larger cities.

Another consideration is the size of the national market. With its population of 35 million citizens, Canada is 10% smaller than the state of California, and about 1/10th the size of the U.S.

However, Waterloo has access to large cultural and English-speaking markets such as the United States, the United Kingdom, and Australia. This bestows some advantage, although it should be noted that 13 of the top 20 ecosystems also use English as their primary business language—15, if Tel Aviv and Singapore are included.

Figure 23. **Percentage of Foreign Customers**

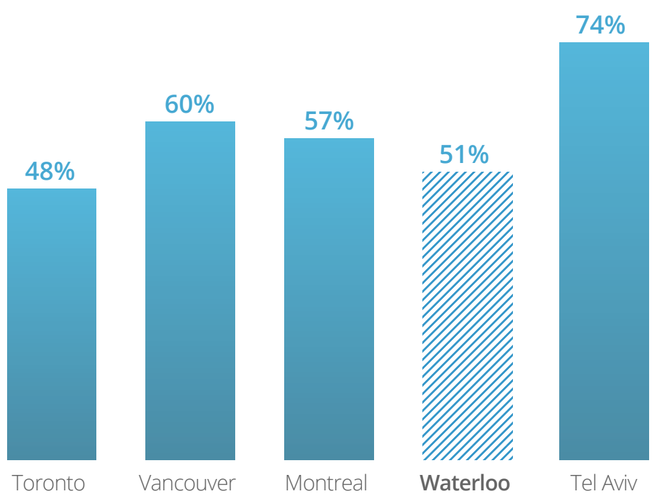
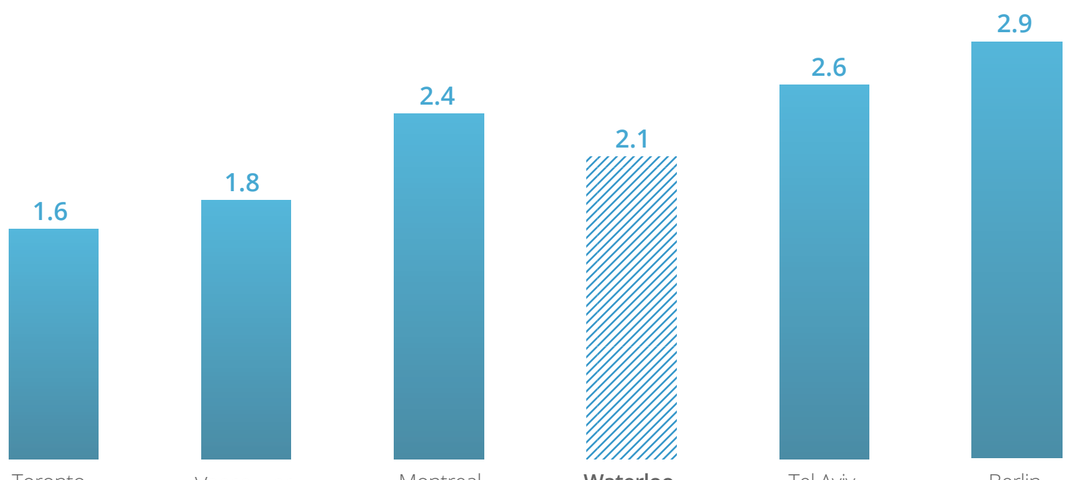


Figure 24. **Number of Product Languages**



Global Market Reach

Note: Because U.S. startups evolve in the best country in which to scale, they do not have to prioritize foreign customers in the same way as startups in other countries do. Therefore, the analysis of this factor will not use U.S. benchmarks.

Because the U.S., the world's largest B2B market,[10] is less than 100 miles away, one would expect Waterloo startups to make extensive use of the opportunity to focus on the U.S. market and enter it earlier than startups in ecosystems that do not benefit from such proximity and lower cost of access. However, on average, 51% of Waterloo startups' customers are foreign (mostly U.S.). While Toronto is similar at 48%, Montreal (57%) and Vancouver (60%) are significantly higher. Tel Aviv also comes in higher, with 74% foreign customers.

Interestingly, although not entirely surprisingly, there is a strong inverse correlation between Local Market reach and Global Market Reach, and between their primary components: percentage of foreign customers and local market size. This makes intuitive sense; the larger the local economy, the less a startup allocates resources to attract global customers. Accordingly, Waterloo and Toronto startups—in or near one of the largest cities in North America—have a lower percentage of foreign customers than (in increasing order) Montreal, Vancouver, and Tel Aviv.

Regression analysis confirms that, for a given local market size, the higher the percentage of foreign customers, the higher the performance of a startup ecosystem. In fact, it suggests a clear causal relationship between a high percentage of foreign customers and a high ecosystem performance.

Combined with the inverse correlation between the percentage of foreign customers and local market size, this makes having a larger local economy like Toronto somewhat of a dangerous asset for a startup ecosystem, and in this case, those of nearby Waterloo. A large local economy is a positive factor for an ecosystem only if its startups takes advantage of it without losing their primary focus on global customers.

The analysis of other variables included in the Global Market Reach sub-factor underlines the lesser focus on global customers of Waterloo startups.

- Product languages: Waterloo's startups offer their products in an average of 2.1 languages, compared to 2.5 for Tel Aviv and 2.9 for Berlin. Vancouver (1.8) and Toronto (1.6) are even lower than Waterloo, while Montreal, with its bilingual character, comes in at 2.4.

10 We consider that while China is the world's largest economy and mobile market, it is not yet the largest Internet market (for B2B or B2C).

Figure 25. **Percentage of Startups with Foreign Offices**

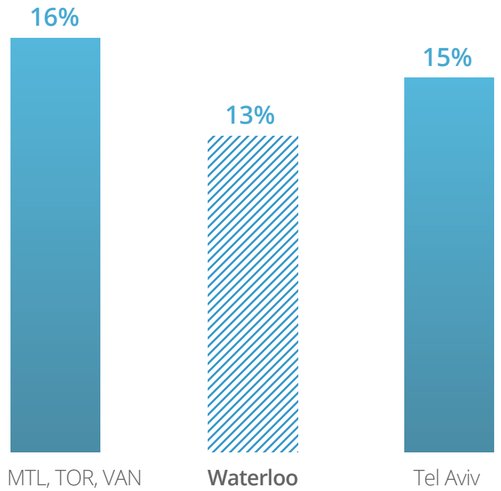
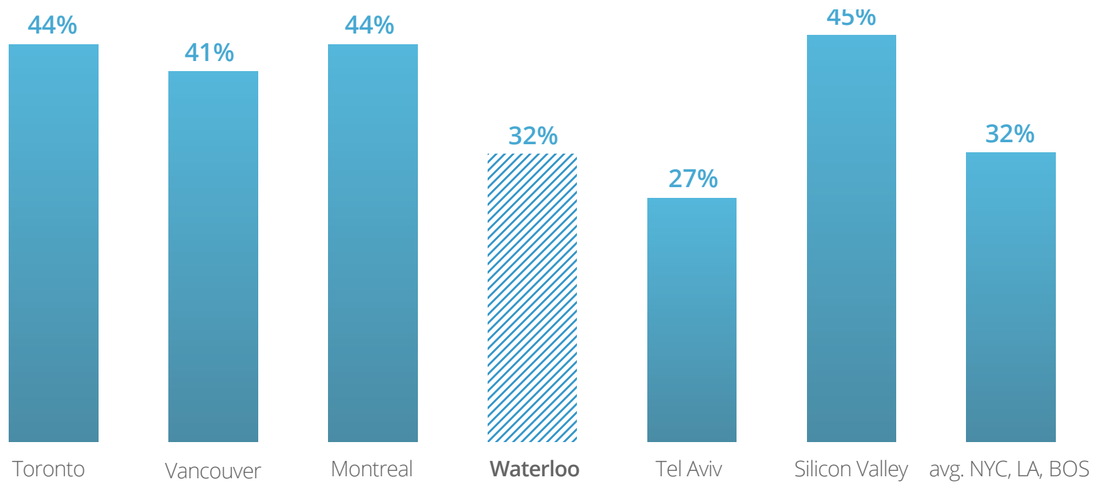


Figure 26. **Perentage of Foreign Employees**



- Foreign offices: The percentage of early-stage startups with an office in a foreign country is a proxy for the degree to which startups in a certain ecosystem focus on attacking global customers. 16% of Waterloo startups have an office in another country, essentially the same percentage as for startups in other Canadian ecosystems. This seems low when put in perspective with Tel Aviv's 15%, a value that is underestimated in our dataset because of certain idiosyncrasies of Israel startups related to the declaration of headquarter and office locations. Whatever the case may be, one would expect to see more Canadian startups opening an office in the U.S., taking advantage of their greater proximity to the U.S. compared to Tel Aviv startups, and for that matter, startups from anywhere in the world. This proximity combined with their shared language translate into a relative ease and lower cost of setting up and managing a U.S. office. Waterloo and Canadian startups are not seizing upon this Global Market Reach opportunity.

Global Reach Opportunity Metrics

While not being strong indicators of a startup's ability to go global, the following metrics indicate relatively higher or lower opportunities to do so.

- Percentage of Foreign Employees: This metric is not a strong indicator of a startup's ability to go global, but it presents an opportunity that's possibly helpful in providing relationships to customers and partners, language skills, and an understanding of global needs. Waterloo startups employ, on average, 32% foreign employees, which is 9% to 13% below Canadian top ecosystems (41% to 44%). After adjusting for funding stage using a regression analysis, Waterloo startups are still 8% to 10% behind Montreal and Toronto, but only 1% away from Vancouver.
- Percentage of Funding Rounds including at least one Foreign Investor (see Figure 13 in Section 4.2): Though a higher percentage may be the consequence of an ecosystem's local funding gap or international integration (from an ecosystem lifecycle perspective), this metric can also point to an opportunity for startups to go global faster and more successfully. Through its foreign investors, a startup is one degree of separation away from foreign customers and senior sales and marketing executives and advisors. 40% of Waterloo's funding rounds include a foreign investor, compared to 21% for Montreal, 22% for Vancouver and 31% for Toronto. Waterloo startups have more foreign investor relationships, but given its lower percentage of foreign customers, this opportunity does not seem to be turned into a Global Market Reach advantage.

Global Focus and Startup Performance

The more important question is whether the positive relationship captured by Compass' Global Startup Ecosystem Report model between percentage of foreign customers and performance measured at the ecosystem level is true at the level of individual startup performance.

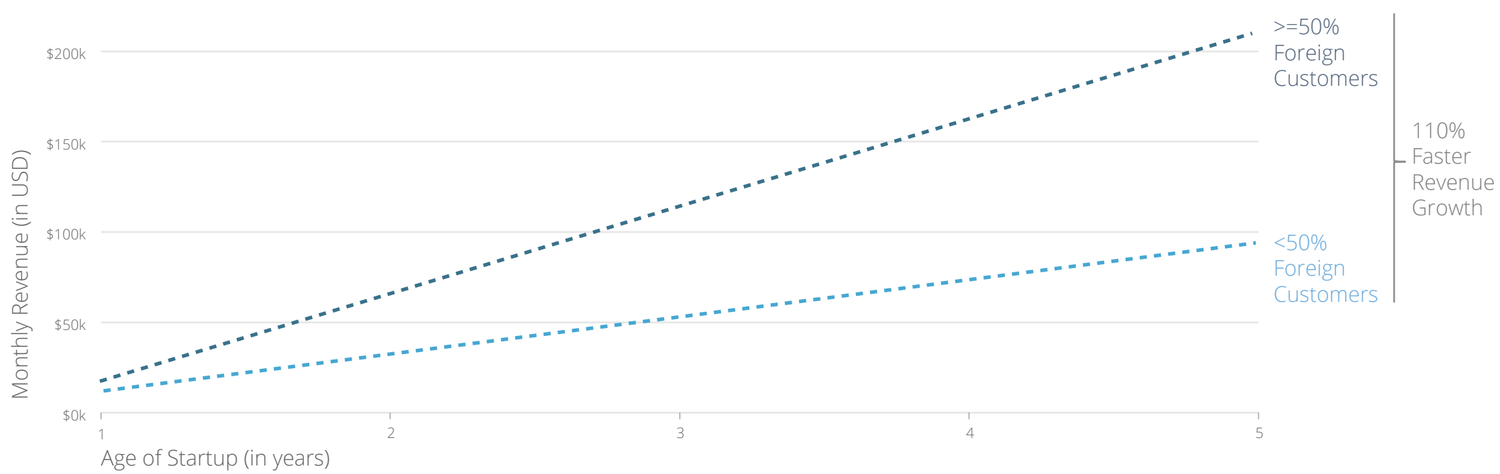
It is generally accepted—and emphasized by investors—that the goal of startups is to grow rapidly and seek a dominant market position, if not a monopoly, especially if a product or service is characterized by strong network externalities and therefore subject to a winner-take-all end game. As Reid Hoffman puts it, the secret of Silicon Valley success is not the startup. It's the scale-up.[11]

In order to achieve that goal, startups benefit from attacking and penetrating the largest open market in the world—the U.S. marke—and scale rapidly. The story of LinkedIn and German competitor Xing illustrate the issue. By 2011 Xing, first focused on Germany, had more than twice as many users as LinkedIn. However LinkedIn was scaling in the U.S. and within the next two years surpassed Xing in number of users. It went on to win the rest of the world, including Germany. This is one of many similar examples.

This suggests that startups, especially non-U.S. startups, that put a greater focus on marketing and selling to foreign customers from an earlier stage should perform better and see their revenue scale faster over the long run. This direct correlation exists because investors base funding amounts and valuations for later-stage startups on metrics including customer and revenue growth, so startups with faster scaling revenues get funded earlier, see their valuation grow faster, and are more rapidly on their way to higher value exits.

11 Wired (2015).

Figure 27. **Revenue Growth of International B2B Startups (excluding U.S. and Canada)**



In other words, startups that put a greater focus on foreign customers do not only grow faster, but achieve faster growing valuations and larger exits (Note: these issues will be revisited along with the sequence of arguments in the conclusion of the analysis in Section 4.7).

The relationship between Ecosystem Performance, Local Market Reach, and Global Market Reach is complex and so is its analysis. The analysis of revenue growth over time versus the percentage of foreign customers confirms the strong relationship between an early focus on global rather than local customers and how fast a startup's revenue scales. Figure 27[12] shows that B2B startups from all over the world (except U.S. and Canada) that are globally-focused (defined as having more than half of their customers based outside of their local country) see their revenue grow more than twice as fast as those that favor local customers from year one to year five after founding. This relationship was tested for different segments of our dataset with enough data points to establish statistical significance. A similar relationship holds true for B2C startups, and specifically for European startups and Asia-Pacific startups.

The relationship between the degree of focus on foreign customers and revenue growth is depicted even more clearly by Figure 29. It shows that within the globally-focused group of startups, those with the highest degree of focus, i.e. with 80% or more foreign customers, see their revenue grow even faster than startups with 50% to 80% of foreign customers.

12 Note that the scale was adjusted to improve readability and some data points that fall outside of the chart's y axis.

Figure 28 shows that the relationship between foreign customers and revenue growth holds for Canadian startups as well. In other words, the analysis shows that focusing primarily on business customers in Toronto, a city well-integrated in the North American economy, leads to lower performance.

There are several reasons, although their importance vary. First, the largest businesses located in Toronto are on average much smaller than the many Fortune 100 and 500 companies based in New York and Silicon Valley, and therefore present more limited growth potential. Even when a U.S. company has an office in Toronto, they are a subsidiary focused on the Canadian market and they do not provide the same opportunity to grow into the much larger parent company.

Furthermore, Toronto-based customers are truly Canadian and are not representative of U.S. customers. After learning Canadian business needs, developing products that satisfy them, and learning how to sell to them, startups can still not be confident of having reached product/market fit for the U.S. market, nor understand what is an effective sales process in the most competitive market in the world. Even more importantly, Toronto-based customers are not targeted by Silicon Valley and other U.S. startups. Therefore, during the critically important customer development effort they cannot help startups define the product fitting their needs while taking into account the latest competing and complementary solutions available in the U.S.

Therefore, the positive purchase decision of several Toronto businesses may be mistaken for global product/market fit, leading to premature scaling.[13] This could lead to major delays just when

13 See the Startup Genome Report Extra on Premature Scaling at https://blog.startupgenome.com/a-deep-dive-into-the-anatomy-of-premature-sca/

Figure 28. Revenue Growth of Canadian B2B Startups with Varying Degrees of Foreign Customer Focus

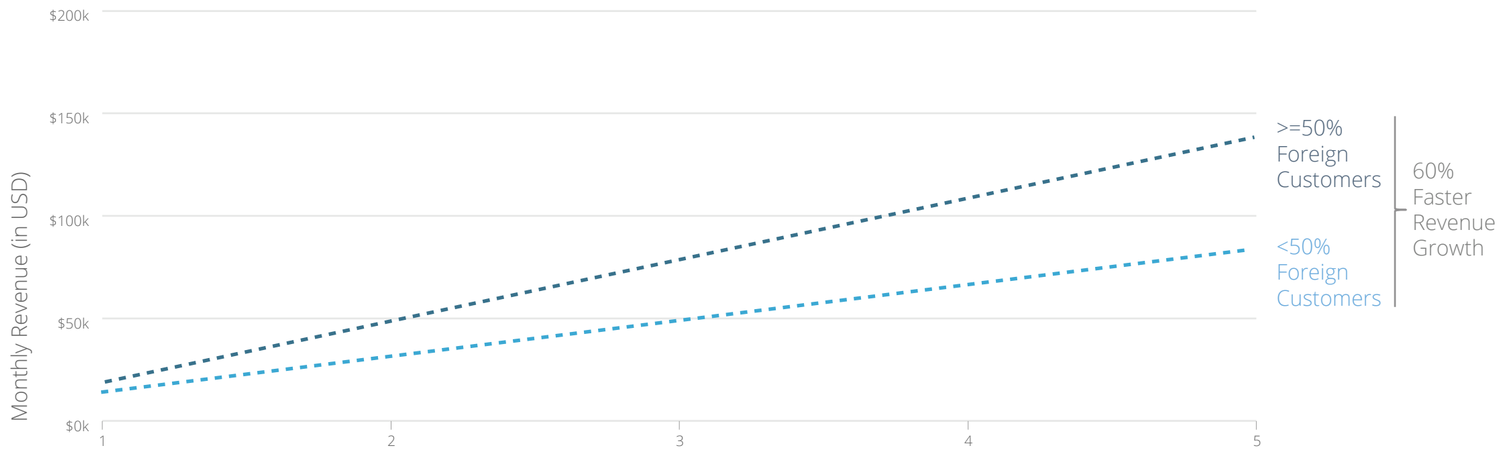
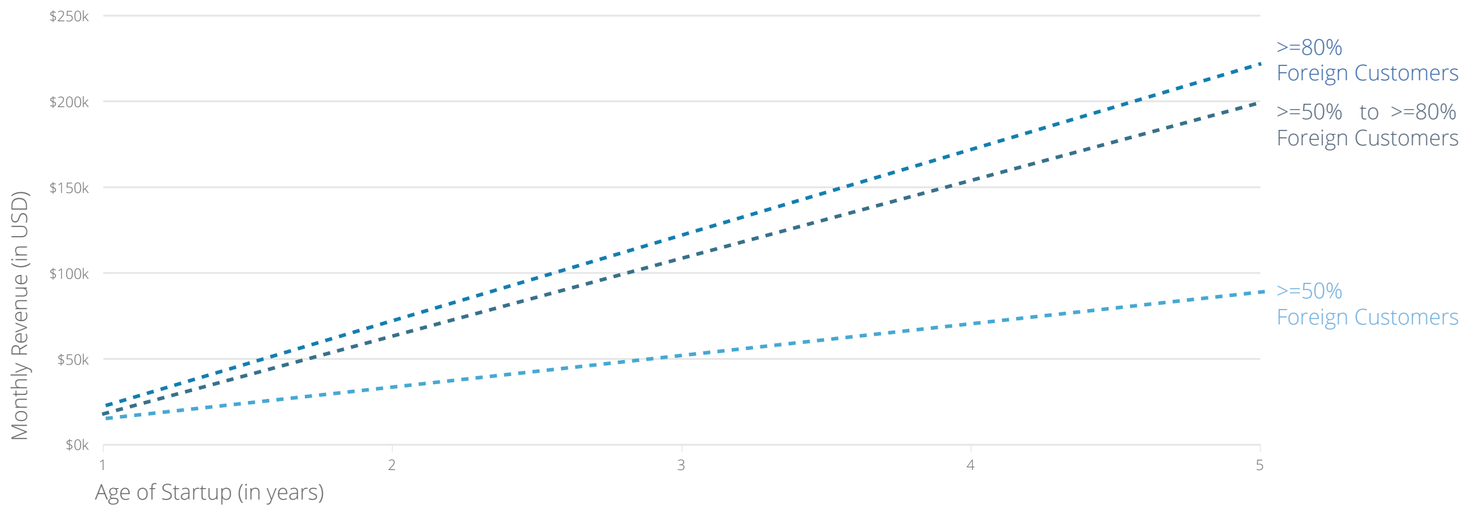


Figure 29. Revenue Growth of International B2B Startups (excluding U.S. and Canada) with Three Levels of Foreign Customer Focus



investors expect fast revenue growth, as the startup is thrown back to product development. Additionally, investors consider all those factors and will offer a relatively lower amount and valuation to a startup that is still mainly focused on the Canadian market.

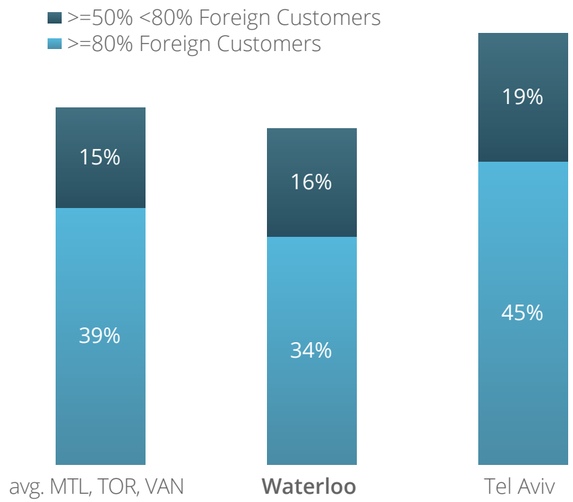
As importantly, when contrasting the charts for all non-U.S., non-Canadian B2B startups against the Canadian ones, it becomes clear that Canadian startups, whether globally focused or not, see their revenue grow more slowly. This parallels their slower growth in funding and exit valuations over time, and supports the relationship between percentage of foreign customers (as well as Global Market Reach) and individual startup performance.

This slower revenue growth may be attributed to the lower percentage of Waterloo and Canadian startups that are globally-focused. As Figure 30 shows, Waterloo and the combined top three Canadian ecosystems have fewer globally-focused startups than Tel Aviv, including fewer startups with 80% or more of foreign customers as seen with the most globally-focused startups.

Interestingly, the revenue growth gap between Canadian and non-U.S./non-Canadian B2B startups is much greater for the globally-focused segment of startups. Taking a different perspective, while globally-focused startups from all over the world (except U.S. and Canada) see their revenues scale more than 110% faster than non-globally-focused startups, globally-focused Canadian startups only grow 60% faster (see Figures 27 and 28). In other words, Canadian startups do not reap as much benefits from choosing to focus on global rather than local customers as startups from other countries.

How could that be? Interviews conducted with startups and experts from all over the world revealed that Canadian startups

Figure 30. Proportion of Globally-Focused Startups



attack the U.S. market in a different, less effective fashion. Partly because they benefit from a shared language and being so close to large U.S. cities, and partly because of the lower cost of doing so, Canadian startups almost always make the decision to attack the U.S. market from Canada. They build the foundation of their sales and marketing team in the Canadian headquarter, and, while they may hire some Americans or Canadians living in the U.S., those teams are managed by Canadian executives.

This comes at the expense of performance and revenue growth. While building the growth team from Canada confers real advantages of costs and easier coordination between the different business functions (R&D, product, sales, marketing), this does not compensate for the significantly lower performance. The fact is that building a fast-growing startup is not a cost efficiency game.

Investors from leading Silicon Valley firms also pointed out that a recurring problem of Canadian startups is growing their revenue and sales operations in the U.S. and that they would benefit from following the example of Tel Aviv by focusing on the U.S. market from inception, and building their team there, with experienced U.S. talent.

Tel Aviv startups do it very differently. Their entrepreneurs often get on a plane to the U.S. from day one, couch-surf if need be, to talk to investors, understand market needs, and forge relationships with potential lead customers. In other words, they focus their customer development process on foreign customers. Avner Warner, Head of Business Development at Wix.com, explains that "the focus of Tel Aviv startups on the U.S. market is sometimes so strong that their products are not even accessible from Israel." They later build their sales and marketing team directly in the U.S. rather than anywhere else and focus on hiring Americans not only because they share the business culture and are experienced and knowledgeable about the market, but also because they possess the best tools, partners, and channels, and come with established relationships with or leading to customers, partners, and employees. They locate the team in a major U.S. city, a cab ride away from many top customers targets—and investors.

For the reasons evoked by Tel Aviv startups, building the sales and marketing team in Canada leads to slower revenue growth despite the shared language, similar culture, and close proximity of top Canadian ecosystems to some of the largest U.S. cities.

Dan Robichaud, a successful Canadian serial entrepreneur who recently sold his startup to Intel (his 4th successful exit in 15 years), explains his success at penetrating the U.S. market: "In Canada we're not very good at U.S. sales and marketing. I live in the Valley

half the time and use U.S. contractors and advisors. I had 15 advisors with equity. It's high for Silicon Valley but this is what you need. They know the U.S. market more than any Canadian and come with contacts and relationship we don't have."

Conclusion
Waterloo and Canadian startups, despite having the U.S. market at their doorstep, fall short in Global Market Reach. Their startups see their revenues grow more slowly than startups from other ecosystems for two reasons:

First, because too many of them are not globally-focused, i.e. they focus their sales efforts primarily on Canadian customers rather than U.S. and other foreign markets. The primary voice of the customer must come from U.S. or other global customers from an early stage. This does not preclude selling to local customers, or taking advantage of the greater market access to them. However, because it is more difficult to sell to foreign customers than to local ones, the primary sales and marketing focus (and accordingly, resource allocation) must be on foreign customers.

Secondly, even when they do focus on global customers they do not get nearly the level of benefits that startups from other ecosystems reap from an early global focus. This indicates that Canadian startups attack the U.S. and other foreign markets in a different, less effective fashion.

Our research suggests that Canadian startups can learn from startups from Tel Aviv and other higher performing ecosystems by building their sales and marketing teams directly in the U.S. around experienced U.S. executives and employees bringing business culture, process knowledge, and valuable relationships with and/or to customers and partners. While increasing their cost of U.S. commercialization, the net benefits will lead to the larger, faster exits that have eluded Canadian startups and constitute the main impediment to the acceleration of the ecosystem's growth.

This is the most important, actionable Performance Factor for Waterloo startups and its ecosystem to generate faster scaling startups, and in turn, faster growing valuations and larger exits.

4.4 Talent

Technical Talent Overall Ranking
There is no lack of innovation-focused engineering talent being produced in Waterloo, as can be seen by the ecosystem's top performance in the recent 2015 Ecosystem Index benchmarking. Largely due to the University of Waterloo and its reputation for being one of the top schools for innovation in engineering and technology in the world, the ecosystem ranks high in all three technical Talent components: Quality, Availability, and Cost.

Waterloo boasts the strongest Talent Index in Canada and ranked among the top 5 globally. Compared to the other Canadian ecosystems, Toronto ranked 15, with Vancouver at 14, and Montreal at 13. It even beats out New York (9), L.A. (5), and Boston (7). Jon Sakoda, Partner at Silicon Valley VC firm NEA, said that Waterloo was unquestionably one of the top three ecosystems in his mind, along with Silicon Valley and Boston.

Talent Quality

The University of Waterloo was ranked Best Overall University in Canada, as well as the one most likely to produce "Leaders of Tomorrow", as defined by the Maclean's 2015 University Rankings issue released in late 2014. Additionally, it has been the number one school in the "Most Innovative University in Canada" category for 23 consecutive years. Its unparalleled entrepreneurial spirit is cited as one of the key contributors to this success including the Velocity program and Velocity Science—a partnership between the Faculty of Science and Velocity, which enables students to initiate and develop world-class life and physical science startups.

'The talent that comes out of Waterloo is similar to that of students at the top 3-5 Computer Science universities in the U.S.", says Matt Murphy of Menlo Ventures, and he is not alone in that opinion. According to Riviera Partners University of Waterloo is the school that produces the second most frequently hired candidates in Silicon Valley, behind U.C. Berkeley and ahead of Stanford, UCLA, and Cornell.[14]

The University boasts an exceptional co-op program, the largest of its kind in the world. 19,000 co-op students have enrolled over three semesters in 122+ programs. More than 60% of undergraduate students are enrolled in the co-op program. For this and many other reasons, the 2015 QS World University Rankings placed the University of Waterloo 24th for Computer Science and 20th for Mathematics globally.[15]

As noted in previous sections, there is a high retention rate of technical and other non-technical employees for startups in the Waterloo Region—with some founders noting that they've never lost an employee. As the war for talent heats up, this can be a strategic advantage for startups, since losing key engineers can cause major

14 Riviera Partners (2015). Engineering Salaries Reviewed. Retrieved September 15, 2015.
15 http://www.topuniversities.com/universities/university-waterloo

headaches and lead to dramatic delays on product development. It's important to note that the counterweight of retention is lower prior experience—startups may hire an engineer and are thrilled that they stay five to six years with the company, whereas the same person working in Silicon Valley might work two or three jobs over the same period. This begs the question as to whether they are learning as much.

This dynamic is also reflected when looking at the percentage of employees with prior experience in a startup. Waterloo startups have an average of 38%, which is similar as to Toronto, Montreal, and Vancouver. Silicon Valley startups have 48% of employees with previous startup experience, and Boston, LA, and New York come in at 43%, 47%, and 53%, respectively.

A number of interviewees said this gap could be attributed to the strong influence that BlackBerry has had over the startup ecosystem until recently. A local business leader noted that BlackBerry (formerly Research In Motion) was influential within the ecosystem and ended up taking in a lot of talent, but not did not educate them in an entrepreneurial way. Now there are other players like Google and Velocity that are offering great resources to entrepreneurs.

John Ruffolo, CEO at Omers Ventures, adds that when BlackBerry was at its peak it was absorbing so many new startups into its own system. Now that the company has taken more of a backseat, it is the students that have been feeding the ecosystem and spurring so much more velocity over the last 36 months.

Talent Availability

Talent availability can be measured by the period of time local startups require to fill vacancies with suitable candidates. With an average time to hire of only 43 days, Waterloo is very similar to the top Canadian ecosystems (42 to 44 days). In comparison with leading U.S. ecosystems, the time to hire engineers in Waterloo is on average two weeks shorter. Yet Silicon Valley's time is even shorter. This is at least partially due to the ability of the Valley to attract talent from all over the world and process immigration papers in record times and at a high success rate, at least from a U.S. perspective. Waterloo neither benefits from being an international pole of attraction, nor from a highly efficient immigration system. It should be noted that hiring times decrease in all cities when the startup has reached Series B—likely due to the fact that these are more established and thus represent more attractive startup opportunities for candidates.

With a great balance between quality and cost of software engineers, Waterloo-based startups have the lowest share of remote employees in Canada (17%). While the extent of the remote workforce in Montreal-based startups is exactly the same, the ecosystems of Toronto and Vancouver both outline values above 20%.

There are clearly many talented software engineers in the Waterloo Region, yet several founders and investors expressed a perceived shortage of talent and senior professionals in other fields. There seems to be consensus that this particularly applies to sales, marketing and design professionals. Given the ecosystem's relatively small size, attracting experts can be a real challenge. Despite the high quality of life Waterloo has to offer, this is understandable and it explains why some startups choose to move to a larger ecosystem where they have easy access to experts in each field.

Another issue when hiring from external markets is the fact that average success rates of immigration applications within startups in U.S. cities average 73%, while Canadian cities are at 23%. This number seems particularly low considering the Canadian federal government created a Startup Visa in April 2013 with the intention to enable greater mobility of talent. That said, the Startup Visa has only processed 5 visas in 21 months out of a potential quota of 2,750 per year, with lack of resources and guidance in the process cited as the major setbacks.

Ecosystems like Silicon Valley rely heavily on acquiring talent from outside of their ecosystem, but given Waterloo's local technical talent pool these immigration numbers may be less of a setback than it would be for other Canadian cities that are ranked lower in the Talent Index. A Senior Policy Advisor for the Ontario Ministry mentioned in an interview that Canada in general is missing an opportunity around the skilled immigrants that are in "our own backyard". He notes that if the government did a better job of connecting immigration agencies with startups, an entire talent pool of skilled workers already eligible to work in Canada awaits.

Talent Cost

While Waterloo is excelling at training the next top tech talent, brain drain to Silicon Valley and New York is still a threat. The appeals of external ecosystems are valid, when looking at it from an economic standpoint. Currently, an experienced engineer will earn an annual salary of approximately $55,000 in Waterloo compared to average of $120,000 in Silicon Valley—often with unlimited upside potential.

Yet from a founder's perspective this means that it is relatively affordable to hire good employees in the Waterloo Region.

"Compared to Silicon Valley, you end up paying 30-50% less for an experienced engineer in Waterloo," says Michael Litt. He even remembers that Ron Conway, a renowned Silicon Valley investor, told him to go back to Waterloo with his company after raising capital in the Bay Area because "that's where you can hire and attain the best engineering talent." Litt also admits that if they hadn't decided to stay in Waterloo but instead moved to Silicon Valley they would most likely have run out of money before their Series A.

The cost of hiring engineers in Waterloo can be further reduced by taking advantage of the federal tax incentive program SR&ED[16], which provides a tax refund to corporations, partnerships, or individuals who conduct scientific research or experimental development in Canada. Qualifying expenditures for the credit may include 70% of wages, cost of eligible contractors, expenditures for materials, equipment leases, and overhead directly related to the development of products that are innovative and present some degree of risk.

It is worth noting here that talent cost does not directly correlate with the performance of startups. In general, having low talent costs won't matter if quality is not there. This is where Waterloo is different. The lower cost of engineers combined with the quality of talent means that startups can achieve more with the same amount of funding—a fact that helps to compensate for the lower average amounts of funding that Waterloo startups receive. At the same time this explains why many international companies see great value in locating a secondary office in Waterloo. (i.e. Google, which has about 300 people at their Waterloo campus). These international additions to the ecosystem are key in growing and attracting new companies to Waterloo in order to develop the region faster than it would ordinarily grow.

16 For more information see http://www.cra-arc.gc.ca/txcrdt/sred-rsde/clmng/clmngsrd-eng.html

Figure 31. **Average Time to Hire (in days)**

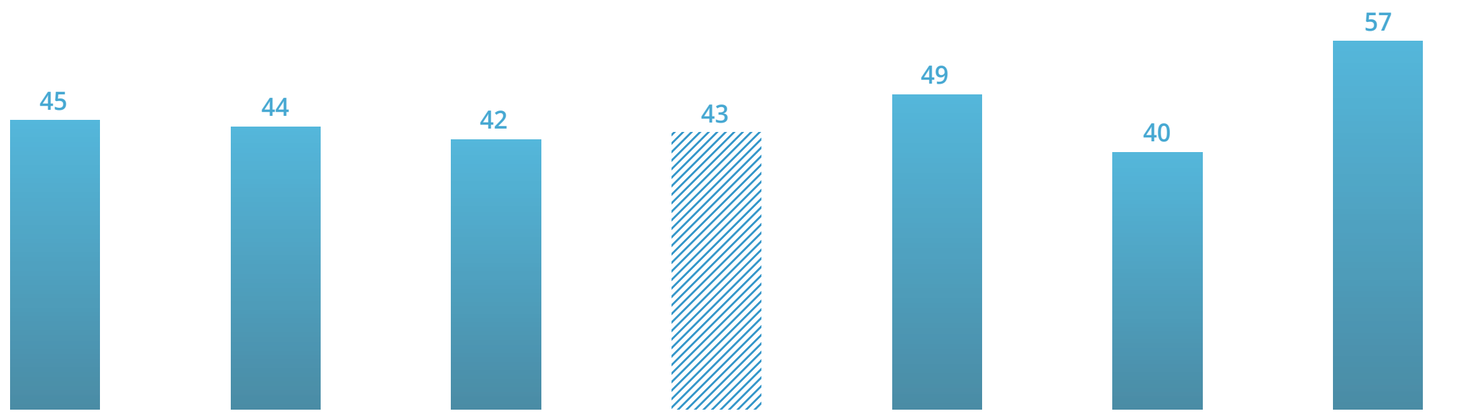
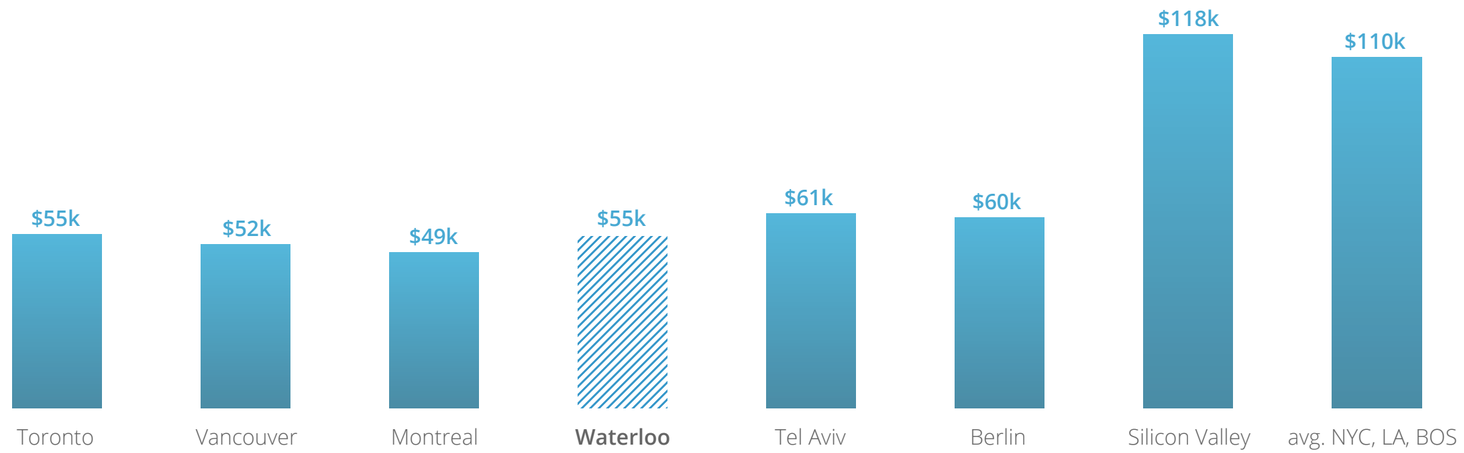


Figure 32. **Software Engineer Salaries**



Conclusion
With Waterloo continuing to produce a higher standard of engineering talent (and the Government of Canada helping to make that talent affordable), the region and its graduates will undoubtedly remain at the top of the list for many startups and tech companies all over the world. But in order to establish itself in the ranks of the top 20 ecosystems, there are a few gaps that need to be addressed. Attracting sales and marketing professionals who have experience in growing startups will have a big impact on how the Waterloo ecosystem evovlves over the next few years. Creating better processes and support for startup visas, as well as infrastructure to retain international students who graduate from Waterloo will help the region grow organically. It would also help local companies hire foreign talent while encouraging international tech companies to set up R&D centers in Waterloo. This would in turn help increase the diversity of the talent pool and increase the level of experience in larger (including hypergrowth) tech companies.

4.5 Startup Experience

Startup Experience measures the level of experience of those stakeholders that are key in a startup's search for a scalable and repeatable business model: founders, employees, and advisors.

Overall, Waterloo's ecosystem ranked within the world's top 20 in Compass' Startup Experience Index. Waterloo ranked particularly high (among the top 10) in terms of founders within experience in a hypergrowth startups, such as Google or Facebook. On the other hand, the number of its advisors with equity and the proportion of startups offering options to their employees from an early stage leaves room for improvement.

Founders with Hypergrowth Experience
Although Waterloo-based founders are fairly young on average, many of them have already gained a significant amount of relevant work experience. Before founding their own ventures, almost every fifth Waterloo entrepreneur (19%) has worked for a hypergrowth startup, largely due to presence of BlackBerry, the University's renowned co-op program, and the presence of a large Google R&D center (see Section 4.4 Talent). Much fewer founders in Toronto (5%), Vancouver (7%), and Montreal (9%) have hypergrowth experience. While 35% of Silicon Valley's founders have worked in a hypergrowth startup, in New York, L.A., and Boston only every sixth founder has—a ratio lower than Waterloo's.

The establishment and exceptional rise of BlackBerry had various positive impacts on the development of Waterloo's ecosystem. First and foremost, the technology company put Waterloo on the global map of innovation. At the same time, by letting hundreds of people experience the startup lifecycle from a small venture of engineering students with a vision to a global player, BlackBerry sustainably enhanced the level of experience within the ecosystem—be it hardware experts, software engineers, or sales and marketing talent.

On the downside, critics argue that BlackBerry had too strict a retention policy, prohibiting many promising spin-off ideas that could have been beneficial to the ecosystem as a whole. Nevertheless, people that were part of the BlackBerry success story agree that they gained invaluable startup experience and learned incomparable life lessons. Many of them also accumulated financial wealth.

When BlackBerry collapsed, a lot of the aforementioned expertise was released into the labor market. However, during several interviews, local experts claimed that this extensive pool of resources could not be sufficiently retained in the ecosystem. Instead, as many former BlackBerry employees became financially wealthy, they left the Waterloo Region to pursue their ambitions elsewhere.

Consequently, the few renowned senior managers that decided to stay in the area became invaluable for the ecosystem's development, both as angel investors and experienced mentors.

The technology giant Google has also been playing a key role in providing hypergrowth work experience by making the Kitchener-Waterloo Region the home to its biggest Canadian R&D office.

> Waterloo ranked particularly high in terms of founders with experience in hypergrowth startups

Startups with an Employee Stock Option Program
Offering an Employee Stock Option Program (ESOP) is a factor linked to startup performance by Compass' Startup Genome research. It also demonstrates the experience and knowledge of founders in terms of key elements influencing their success, and the degree of "startup culture" in the ecosystem. The fact is, if employees do not believe in the upside offered by stock options, there are fewer reasons for a startup to offer them.

It seems that the experience of Waterloo's founders has helped them develop a good sense of how to compensate and motivate employees. 45% of Waterloo startups have a stock option programs. This compares to 35% for Toronto, 39% for Vancouver, and 40% for Montreal. Founders in Montreal give, on average, 13% of equity to employees, which represents the highest value among the top Canadian ecosystems. Startups within leading American ecosystems allocate 11% of equity to employees only 1% more than those based in Waterloo.

Employees with Startup Experience

At just 38% of employees with prior experience working for a startup, Waterloo-based employees have, on average, relatively less experience working for startups. Most local tech ventures are university spin-offs that employ inexperienced, yet highly skilled, graduates from the University of Waterloo.

Respective ratios of the Canadian ecosystems of Toronto (35%), Vancouver (39%), and Montreal (40%) lay in the same range. In contrast, every second startup employee within the top U.S. ecosystems has gained previous experience working for a startup.

Advisors with Equity

Compass' Startup Genome Project and report series have confirmed the importance for a founder to have experienced, reliable and committed advisors. The report further identified a good marker of success as to whether stock options have been granted—this is an indication that the advisor has real interest in the startup's success and will offer formal advice on a regular basis (rather than informally and intermittently), including delivering tough messages to the founder if appropriate.

Figure 33. **Founders with Hypergrowth Experience**

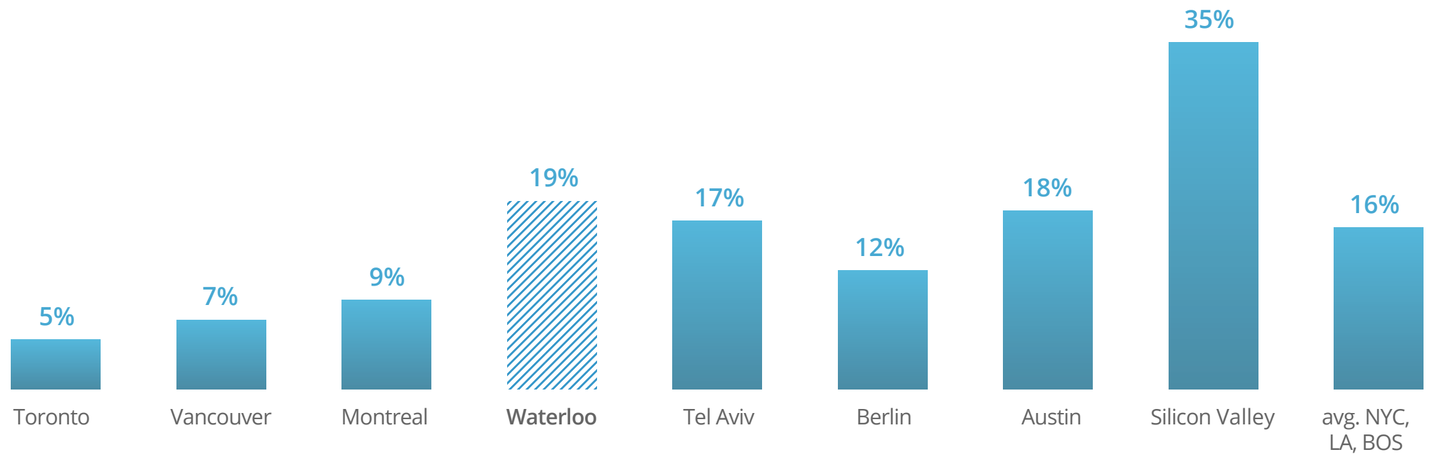
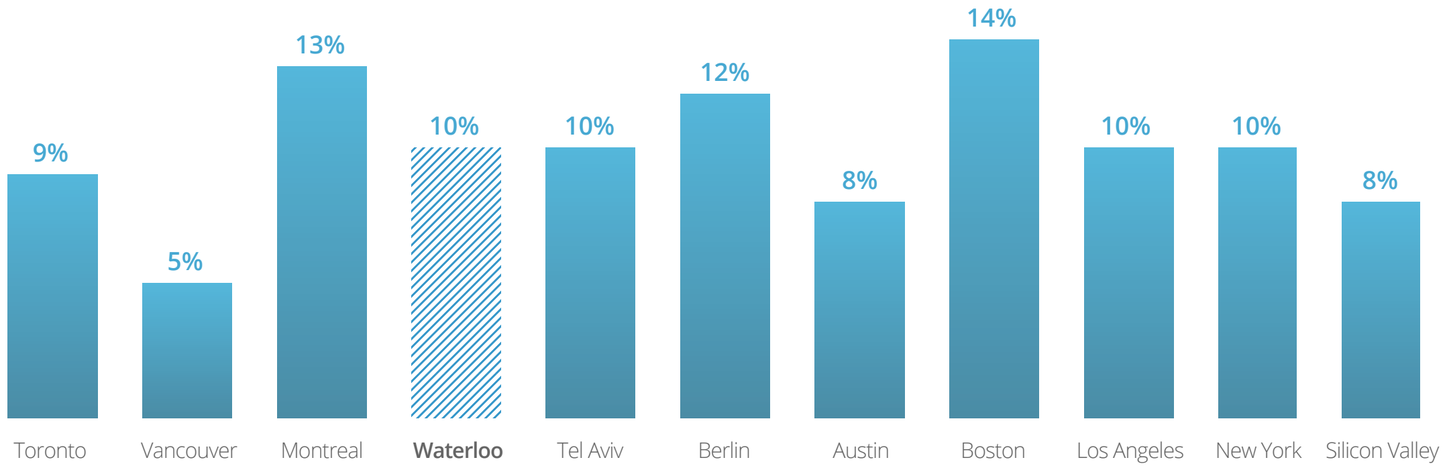


Figure 34. **Percentage of Startups with an Employee Stock Option Program**



As mentioned earlier, the Waterloo ecosystem consists of a very tight-knit and collaborative community where everyone is invested in helping one another succeed. That said, what the community is especially lacking in order to further mature is a critical mass of startups that successfully experienced the entire startup lifecycle, such as BlackBerry.

Based on the local scarcity of experienced experts, the interplay between founders and advisors is identified as an area for improvement. Waterloo has the second lowest ratio of advisors with equity in Canada with Montreal (0.8), compared to 1.0 and 1.5 respectively for Toronto and Vancouver.

When analyzing this factor in leading U.S. ecosystems, the stronger engagement of experienced advisors becomes apparent. Startups in New York, Los Angeles, and Boston mostly involve one more advisor with equity, resulting in an average value of 1.8. This is particularly alarming given the relatively low age of founders and the relatively low experience levels of employees based in Waterloo. While it is noted that Communitech has instilled a culture of free mentorship between older and younger founders, nothing matches the level of engagement of advisors with equity–those with a direct benefit and formal commitment towards the startup.

Conclusion

Startup experience really began to spread more broadly throughout Waterloo in 2008 when it became a valid option to leave BlackBerry to set up a new technology business. As the community matures, there is a new crop of ambitious entrepreneurs with an eye toward IPOs coming up the ranks.

Through a joint effort of all stakeholders involved, the establishment of secondary offices by large tech companies and the gen-

Figure 35. **Percentage of Employees with Startup Experience**

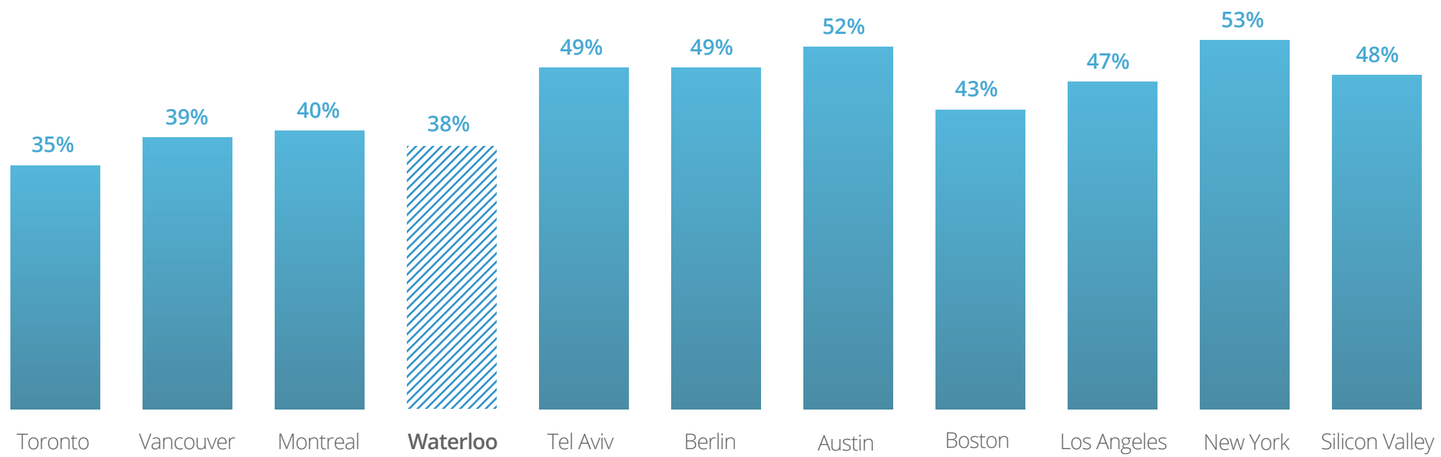
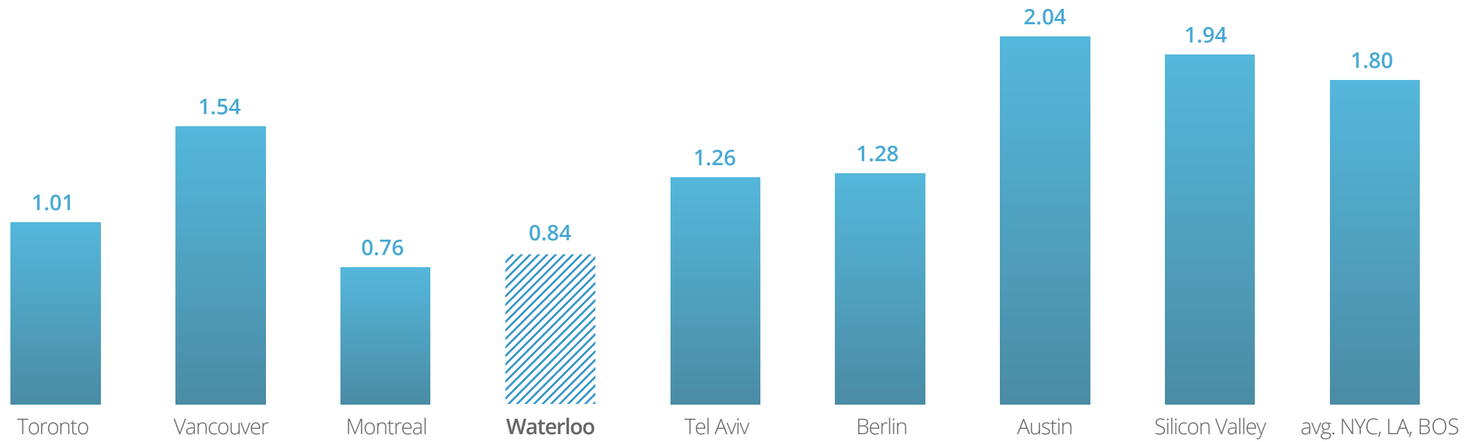


Figure 36. **Number of Advisors with Equity**



eration of larger success stories such as BlackBerry and Kik, the general level of startup experience in the community will increase. Eventually, this is likely to result in a more mature ecosystem that has the key ingredients to compete with the world's leading startup hubs.

4.6 Policy

On the national policy level, the Global Entrepreneurship and Development Institute (GEDI) ranked Canada second, only three points behind the U.S. in their 2015 Global Entrepreneurship Index (GEI). Canada ranks higher than Australia and the United Kingdom by four and nine points respectively and outperforms both the global and North American average on all indicators. Figure 37,[17] built using the GEDI's interactive data explorer, shows Canada's GEI performance as compared to the U.S. As illustrated in the chart, Canada is relatively on par with the U.S. performance except for the indexes of Startup Skills, Product and Process Innovation, and High Growth. Canada's relative strengths are in Opportunity Perception, Networking, Cultural Support, Opportunity Startup, Human Capital, and Internationalization.

While the Government of Canada's initial tax credits on venture investments failed, they later revamped their approach, investing as LPs (Limited Partners) to help create larger venture funds and selecting experienced GPs (General Partners). This approach has been much more successful. The Venture Capital Action Plan (VCAP) was established in 2013 to bolster venture capital and direct more resources to startups. It does so by backing funds of funds with $1 for every $2 they raise from private sources.

17 Global Entrepreneurship and Development Institute. Data Explorer, interactive tool, retrieved on August 20, 2015, http://thegedi.org/tool.

The strategy has spawned four funds of funds. For instance the government of Ontario is involved as an LP in the fund of funds managed by the Northleaf Venture Catalyst Fund (NVCF) and the Government of Quebec is involved in the Teralys Capital Innovation Fund.

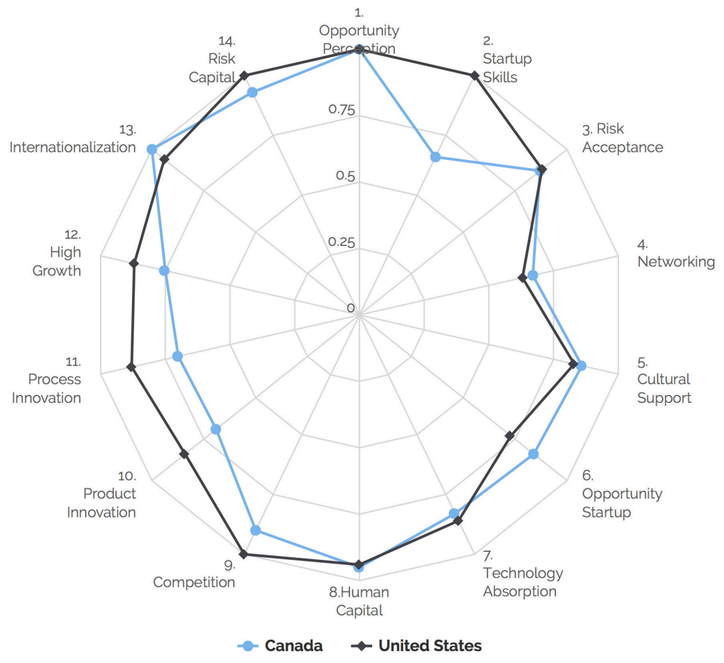
The Government of Ontario has established a seed fund called the Investment Accelerator Fund, where they invest up to half a million in promising young startups. Even though they could invest the full amount on their own, there are clear benefits to the Government of Ontario working with local VCs and angels to co-invest in convertible debt. The fund was founded in 2007 and has invested $49 million into over 100 companies, with follow-up investments of up to ten times that amount, from private investors, making it one of the most active seed funds in the country.

The Province of Ontario also created the Ontario Venture Capital Fund, a risk capital strategy that is estimated to have increased risk capital in the province by about 40%.

The Canadian Trade Commissioners Service has also created the Canadian Technology Accelerators (CTAs). Their mission is to help high-growth Canadian companies penetrate global markets. Sectors of focus include Information and Communication Technologies (ICT), Life Sciences, and Sustainable Technologies industries. Services include access to free office space and mentors; support in accessing financial resources; support in refining business models for global market opportunities; and exposure to global partners and customers.

> GEDI ranked Canada #2 in its 2015 Global Entrepreneurship Index

Figure 37. Global Entrepreneurship Index Canada vs. the U.S.



The nine CTAs offer a different program with the New York organization running a digital tech program focused on accelerating market penetration for startups that have raised at least $1 million and/or $1 million in annual revenue. Startup participants that were reached for comments have expressed having benefited from the program, along with the desire for more resources, including access to investors.

The Government of Canada has also been taking strides in making better policies for small businesses and entrepreneurs. It has reduced the small business tax rate to 11% and increased the income limit for the small business tax rate from $300,000 to $500,000. Finally they are increasing the lifetime capital gains

exemption (LCGE) for small business owners from $500,000 to $800,000 and indexing this new limit to inflation. On account of indexation, the LCGE limit increased to $813,600 for 2015. However, some of the restrictions may hinder the growth of angel investment activities. For example, most angels prefer to co-invest or join a certain syndication, but the new tax rollover does not apply to personal investment made through a corporate structure. In addition, the reinvestment limit of $500,000 may be restrictive to some angels.

There is also more work to be done around immigration policies. The Startup Visa that launched in April of 2013 was made to enable greater mobility of talent and give startups the ability to hire internationally, as well as to position Canada as a welcoming place for international startups to set up shop. Unfortunately it has led to very few visas being issued, with lack of resources and guidance cited as the major reasons for the setback.

Regarding local, city-level policy, while the 2015 CITIE report[18] does not analyze Waterloo, the analysis of Toronto may provide some insights useful to the Waterloo Region. CITIE stands for City Initiatives for Technology, Innovation, and Entrepreneurship. It provides local policymakers with a resource to help them develop policy initiatives that catalyze innovation and entrepreneurship. In their analysis, Toronto fares well in supporting its SMBs (SMEs) and entrepreneurs within the city but the report suggests it could be much bolder in supporting them internationally through trade visits and raising the profile of the city.

Toronto performs well for its roles in infrastructure as Host, Investor, and Connector. However it falls behind peers across other policy areas in Regulator, Customer, and Strategist roles. For example, developing a procurement policy that allows SMBs (SMEs) to actively engage in the city's procurement, and using challenge-based procurement methods to solve problems would support Toronto in creating an optimized, enabling environment for high-growth innovative businesses. The city should seek to use procurement as a lever to stimulate innovation and make an explicit commitment to procure city solutions from startups.

Steven Woods, Engineering Director at Google, says that some of the most effective things policy makers can do to further improve the ecosystem includes enhancing transit to and from the Waterloo area with increased access from Toronto and between Waterloo and Pearson International Airport. Further, while there is excellent access to top-tier software and hardware talent locally, it's sometimes harder to acquire highly qualified people internationally—which does not make sense for a country seeking to take a leading position in tech. Woods personally has been able to build a high performing team consisting of locally recruited talent, returning Canadians from the U.S. and international experts, but feels that this option needs to be available to more startups in order for Waterloo to truly compete with other major startup centers worldwide.

The overarching message is that while much has been done to kickstart entrepreneurship in the region, it is now time for policymakers at every level of government to take the next step and set up policies that support the growing number of startups that those initiatives have produced with better funding and growth programs, and invest in infrastructure.

18 Nesta, Accenture, and Future Cities Catapult. (2015). City Initiatives for Technology, Innovation and Entrepreneurship—A Resource for City Leadership.

Relevant Case Studies

5

The following section aims to examine high-performing startup ecosystems that have several key similarities to the ecosystem of Waterloo, and are in one way or another one step ahead of it. From a global perspective, the startup ecosystems that offer the most learning potential for Waterloo have been identified as Tel Aviv, Israel, and Cambridge, U.K. Both of them have been or are currently facing some of the most pressing questions of the Waterloo ecosystem:

- How can startups in small markets rapidly grow revenue?
- How can a small startup ecosystem develop world-class local funding sources?
- How can an ecosystem leverage and interplay with its larger neighboring ecosystem?

Together with Section 4, Ecosystem Assessment, the following case studies are intended to set the stage for recommendations as to how the ecosystem of Waterloo can further its performance and global competitiveness.

5.1 Tel Aviv, Israel

Tel Aviv is one of the most successful startup ecosystems in the world and the best example of a relatively small city becoming an internationally integrated startup ecosystem. With an urban population of only 1.3 million (metro: 3.6 million) it is ranked #5 in Compass' Global Startup Ecosystem Ranking 2015.[1] The incredible productivity of the local tech industry has led to the creation of 230,000 jobs, or 2.8% of the population (4.6% of active population), and a revenue output accounting for an astounding 17.6% of the country's GDP.

1 See the Methodology section of Compass' Global Startup Ecosystem Ranking 2015 at http://startup-ecosystem.compass.co/ser2015/

In the early 1990's many Israeli tech entrepreneurs failed despite their ability to create innovative, cutting-edge technology products. According to experts, these failures mostly occurred due to a distinct lack of local funding sources. Public and private leaders were eager to enhance Israel's tech ecosystem in the interest of economic growth, but also national security. With the intention to accelerate its growth, the government sought to attract international capital, investors, and expertise, particularly from Silicon Valley.

Establishment of Domestic Venture Capital Sources

In 1993, the Israeli government established the public venture capital fund Yozma Venture Capital, Ltd. to infuse the domestic ecosystem with financial capital from abroad. The long-term ambition was not only to carefully grow local funding sources and expertise by learning from the best, but to encourage some of them to move to Tel Aviv. Therefore, the government created a stipulation that each investment had to be backed by three parties: a foreign venture capital firm, a local venture capitalist, and an Israeli investment company or bank. $100 million was allocated to set up ten funds, which had to raise $20 million each in order to receive $8 million in government funding. The foreign investor was incentivized by the upside reward perspective to buy-out the government equity stake of 40% after five years for the initial price, plus a 5 to 7% interest rate. To attract international investors, legal affairs and administration were based on U.S. practices. As a consequence, more than a dozen international VC firms from the U.S., Europe, and Japan became familiar with investing in Israeli startups and established local offices there, mostly in Tel Aviv. At the same time, Yozma started directly investing in local startups.[2]

2 Senor, Dan and Singer, Saul (2009). Start-up Nation. The Story of Israel's Economic Miracle. Hachette Book Group, New York

With the Yozma program the country's annual venture capital outlays rose from $58 million to $3.3 billion between 1991 and 2000. Today Israel consistently ranks among the top three countries with the highest ratio of private equity investments to GDP.

Ever since the Yozma initiative the government continued to further develop Israel as a globally integrated startup ecosystem. The angel investment tax incentives introduced in 2009 were only one example that demonstrates how determined political leaders work to meet emerging needs of the private sector. Under the "Angel Law", investors are granted the ability to offset investments in tech startups of up to $1.5 million from their overall taxable income. In case of multiple investments, several tax benefits apply.[3]

Development of Global Market Reach

Despite a limited local market (Israel's 2014 GDP was slightly above $300 billion, compared to $1.7 trillion for Canada), Tel Aviv-based startups typically target global customers from the onset. Founders often get on a plane to the U.S. from day one to forge relationships with potential customers and develop their product-market fit overseas—a strategy that is particularly pursued by B2B startups. The focus on the U.S. market is sometimes so complete that their products are not even accessible from Israel.

In line with this decisive approach, the globally-focused Tel Aviv startups start building their sales and marketing function directly in the U.S. by hiring Americans. Avner Warner, Head of Business Development at Wix.com, explains: "It's very difficult to find these positions in Israel because they are looking out for people in

3 Globes Publisher Itonut (1983) Ltd. (2014). Bennett unveils revamped aid to Israel's tech industry. Yuval Azulai and Gali Weinreb. Retrieved Aug. 02, 2015 from http://www.globes.co.il/en/article-bennett-unveils-plan-to-revamp-aid-to-israels-tech-industry-1000971036

the U.S. In B2B, you need someone who speaks the customer's language and has relationships." Here, "language" has a much broader sense than just English. It also encompasses other issues such as a shared culture, ways of doing business, selling, and being sold to, etc.

Quantitative analyses and expert interviews confirmed that the ecosystem of Tel Aviv has masterfully developed international scaling capabilities (ranked #1 in Global Market Reach[4]). Before examining the underlying drivers of this performance, it is important to note that the globalization of Israeli startups has been traditionally reinforced by the strong sense of community of the international Jewish culture. Other countries and cultures benefit from a strong sense of community, but few enjoy the same geographic distribution.

The Israeli Cooperation Network (Icon) is a pay-it-forward cross-border community organization of Israeli and Silicon Valley experts and is an institutional example for the strong connections and engagement between the two ecosystems. The invite-only network unites people that are significantly driving technological advancement, in any kind of way, and can therefore open a lot of crucial doors. A co-working space located in the heart of Silicon Valley brings the community together to ensure the key requirement of shared value creation: conversation.[5]

Israeli accelerators in Silicon Valley also help young entrepreneurs profit from the highly collaborative Israeli culture, as shown by the Silicon Valley-based seed fund UpWest Lab, for example. The accelerator enables Israeli founders to be physically present in Silicon Valley, enabling top-quality feedback on products and processes. This, in turn, often translates to faster product iteration and lean startup management. They also gain access to U.S. customers, venture capital, and experienced mentors. Furthermore, the close network of like-minded entrepreneurs make the experience of such programs invaluable. UpWest Labs takes a stake of 4 to 8% in return, a percentage typical for accelerators.[6]

"After the program, we had three paying U.S. customers, five more customers in the pipeline, and a clear vision of how to go forward. Any questions?" states one alumni on the accelerator's website.[7]

The Israeli government heavily encourages foreign incubators to establish a local office in Israel by assuming many of the financial risks involved. Governmental investments of over $650 million between 1991 and the end of 2012 led to a dense network of incubators, which have significantly supported startups in their development process. During this time around 1,500 companies graduated from a program, out of which 60% successfully attracted private investments.[8]

In 2011, the Office of the Chief Scientist (OCS) realized that foreign incubators in Israel is another key driver needed to foster access to foreign markets. The OCS supports international R&D collaborations between Israeli startups and foreign stakeholders (startups as well as multinational corporations). In order to qualify for governmental investments, early-stage incubators have to demonstrate the value they create locally and the capability to support startups with international scaling, i.e. proving their capability to reach global markets and customers. To ensure local value creation, penalties have been established for leaving Israel. If a company gets acquired outside of the country, the OCS claims a reimbursement of six (rather than three) times as high as the value of their grant.[9]

Conclusion

In these and many other ways, Israel (particularly Tel Aviv) has managed to develop a globally competitive venture capital industry and leveraged it to successfully scale its tech startups and ecosystem beyond its national borders. A dense international network to exchange financial capital, knowledge, and inspiration with the United States and Europe has been successfully established. As one remarkable result, Israel has produced more than 70 NASDAQ-listed companies in its 66 years of history.

4 See the Methodology section of Compass' Global Startup Ecosystem Ranking 2015 at http://startup-ecosystem.compass.co/ser2015/

5 Israel Cooperation Network (ICON) (2015). Landing Page. Retrieved Sept. 01, 2015, from http://iconsv.org/

6 UpWest Labs (2015). Program. Overview. Retrieved Sept. 01, 2015 from http://upwestlabs.com/program

7 UpWest Labs (2015). Landing Page. Retrieved Sept. 01, 2015 from http://upwestlabs.com/

8 OCS-Office of the Chief Scientist of the Ministry of Industry Trade and Labor (2015). About us. Retrieved Sept. 04, 2015 from http://www.incubators.org.il/article.aspx?id=1703

9 Dublin Commissioner for Startups (2015): Chief Scientist, I'm Impressed. Retrieved Sept. 10, 2015 from http://startupdublin.com/chief-scientist-im-impressed/

5.2 Cambridge, UK

Located approximately 60 miles north of London, U.K., the small university town of Cambridge is home to one of the most powerful clusters of tech innovation in Europe. With around 1,500 tech and biotech companies, the ecosystem employs around 60,000 people and generates more than $30 billion in economic value per year. A quarter of the total working population is active in the knowledge intensive sectors—over twice the national average. At the same time, Cambridge hosts twice as many startups per capita as any other city in the United Kingdom. Among them are 14 tech startups valued above $1 billion, two of which are valued in the range of $10 to 20 billion.[10]

Most of the region's innovative capacity stems from the commercialization of the world-class research capabilities at the University of Cambridge. Until today, the institution's own investments have been leveraged by a factor of 75x. Outside of the United States, no other university in the world has spawned such a high-performing cluster of technology businesses.[11] However, various experts warn that sustainable growth of the ecosystem's value creation is currently at risk and the ecosystem requires even better access to skilled talent coming in from London.

Accordingly, the proposed solution to the predominant capital need is to create different types of infrastructure, a move assumed to trigger a greater influx of skilled people. This is particularly sought by fostering the collaboration between Cambridge, Oxford, and London, often referred to as the "Golden Triangle".

> "Effective infrastructure enables agglomeration effects by increasing the density of economic activity, creating positive multiplier effects that increase the value of other types of investment"[12] —RSA City Growth Commission

Closer Integration with London

In December 2014, a group of Cambridge-based entrepreneurs and investors published the report "Connect People, Build Infrastructure, Grow Clusters", which contains a catalogue of initiatives said to improve the region's entrepreneurial infrastructure. The report suggests significant improvements to existing rail infrastructure. According to the consortium, the objective should be to reduce travel time by train between Cambridge and London from one and a half hours to 40 minutes by 2016. As a reference, the distance from San Francisco to South San Jose—together forming the world's leading startup ecosystem of Silicon Valley—is 48 miles, as compared to 60 miles from Cambridge to the southern suburbs of London, and 70 miles from Waterloo to Toronto. With higher speed, increased frequency, and reliability, more entrepreneurs will be encouraged to utilize the wider region's deep pool of resources.[13]

Having surveyed local entrepreneurs, the 2015 Tech City U.K. Report echoed this demand by suggesting that Good Transport Infrastructure is currently the most important growth driver for Cambridge.[14] "To foster exchange, boundaries—both physical and cultural—need to be fluid," says Stewart McTavish, Director of the University of Cambridge's ideaSpace initiative.

In addition to connecting the two places, the report aims to also connect people and ideas. In order to cluster the knowledge of entire Southeast England and foster exchange, a dedicated space in a central location has been suggested. King's Cross—London's hub for science and technology—would become the focal point of the innovation corridor. Here, the assessment, exchange, and training of best-practices would empower the region's entrepreneurial expertise, especially with regards to scale ups.[15] The local councils and the University of Cambridge have also united with the central government to create the City Deal, an initiative touting a first installment of more than $150 million in infrastructure spending—with up to approximately $600 million additionally available.

Conclusion

As mentioned, several milestones to push the boundaries of local growth have already been initiated. The increased regional integration will allow Cambridge to continue to develop by enabling wider access to the region's skilled workers. All of the initiatives stated above pursue the singular objective to bind current business networks into larger, more efficient, and more productive agglomerations.

10 Tech City UK (2015). Tech Nation Cluster Profile: Cambridge. Retrieved Sept. 04, 2015 from http://www.techcityuk.com/blog/2015/03/cluster-profile-cambridge/

11 London Stansted Cambridge Consortium (LSCC) (2015). The Strategic Case for Investment in the West Anglia rail route. Retrieved Sept. 04, 2015 from http://lscc.co/wp-content/uploads/2015/06/1126.7-LSCC-West-Anglia-Strategic-Case-270515_F-FINAL.pdf

12 City Growth Commission (2015). Connected Cities: The Link to Growth. Retrieved Sept. 04, 2015 from https://www.thersa.org/discover/publications-and-articles/reports/connected-cities--the-link-to-growth/Downloa

13 Cleevely, David et al. (2014). Connect People, Build Infrastructure, Grow Clusters. How to make the Most of UK Innovation. Retrieved Sept. 07, 2015 from http://entrepreneurshippolicy.co.uk/wp-content/uploads/2014/11/Connect-People-Build-Infrastructure-Grow-Clusters-report-Final.pdf

14 Tech City UK (2015a). Tech Nation. Powering the Digital Economy 2015. Retrieved Sept. 07, 2015 from http://www.techcityuk.com/wp-content/uploads/2015/02/Tech%20Nation%202015.pdf

15 Cleevely, David et al. (2014). Connect People, Build Infrastructure, Grow Clusters. How to make the Most of UK Innovation. Retrieved Sept. 07, 2015 from http://entrepreneurshippolicy.co.uk/wp-content/uploads/2014/11/Connect-People-Build-Infrastructure-Grow-Clusters-report-Final.pdf

Key Findings & Recommendations

6

6.1 Key Findings

The Waterloo Region solidly ranks among the top 25 startup ecosystems in the world thanks to its top quality tech talent and its productivity, which stem from both its entrepreneurial and community spirit.

Waterloo's Ecosystem Value is between $2.8 and $3.4 billion, ranking between the 26th and 30th position globally (see Section 4.1). It is comprised of between $2.7 billion and $3.3 billion[1] in pre-exit startup valuations and only $130 million in Exit Value. The low Exit Value and its slow growth (relatively stable over the last two years while Exit Values in top U.S. and European ecosystems have growth 46% and 314% respectively) is the #1 problem of Waterloo and top Canadian ecosystems. It breaks down into a) a small number of startups reaching a successful exit and b) start-ups exiting at lower valuations.

While the low Exit Value is a symptom of problems with funding and growth, it remains a lagging indicator. The exceptionally low ratio of Exit Value to Ecosystem Value (only 4.1%) may indicate the ecosystem is fast-growing and about to generate an increasing number of exits.

Waterloo's Growth Index of 2.4[2] confirms its relatively rapid growth, faster than the top three Canadian ecosystems and third fastest in North America. All of those ecosystems are, like Waterloo, in the Maturity phase of the ecosystem lifecycle (see Section 2). More specifically Waterloo is in the Regional & National Attraction segment of the Maturity phase because it attracts many startups and tech companies to open secondary offices in Waterloo, but not to move their headquarters from international locations to Waterloo–nor has it attracted any VC firms. Most European and APAC ecosystems are younger and have been growing much faster, being either in the Activation or Integration phase. For instance Berlin and Hong Kong have a Growth Index of 10 and 3.0, respectively.

Waterloo Region produces some of the best technical talent in the world (see Section 4.4). Its reputation among several of the largest global tech companies (e.g. Apple) and Tier 1 VC firms leaves no doubt. Neither does the fact that the University of Waterloo's graduates are the second most frequently hired in Silicon Valley, only behind UC Berkeley and ahead of Stanford, UCLA, and Cornell.[3]

> Waterloo Region produces some of the best technical talent in the world

The influx of young technical talent coupled with the high employee retention has lead to a lower proportion of employees with prior startup experience. Similarly, the lack of exits has led to fewer employees with startup experience being released back into the ecosystem, including a smaller number of advisors with equity. However the presence of R&D centers established by large tech companies has fueled a higher level of founders with hypergrowth experience than in the top two to four U.S. ecosystems (New York, L.A., and Boston).

The availability of quality technical talent has contributed to the development of a disproportionately high number of innovative technology and tech startups, along with the establishment of R&D centers by medium and large tech companies, namely Google. Its 1,100 startups for a population of about half a million people represents the second highest startup density in the world, only slightly behind Silicon Valley and a full 50% denser than any other ecosystem in the world.

Nevertheless, the performance of Waterloo and other Canadian startups is much lower than that of startups in top U.S. ecosystems (see Section 4.1). This is measured by the growth in startup valuations at funding over time, which is two to three times slower than for Silicon Valley and the top two to four U.S. ecosystems. The growth in exit valuations over time shows a similar pattern, including when compared to Tel Aviv startups.

There are two root causes of the slow valuation growth and low Exit Value in Waterloo and top Canadian ecosystems.

The first is directly related to a Global Market Reach gap (see Section 4.3). Canadian startups achieve a slower revenue growth because of their lesser focus on foreign (namely U.S.) customers from the onset and the fact that too many startups attempt to attack the U.S. market from their Canadian base.

Research shows that startups that prioritize foreign customers see their revenue grow more than twice as fast as those that do not. Yet startups in Canadian ecosystems do not prioritize growing into the U.S. market. They have a lower average percentage of foreign customers and of startups that are globally-focused (defined as having more than 50% of foreign customers).

1 Not including Kik.com's funding valuation in the third quarter of 2015

2 For more information see the Methodology section of Compass' Global Startup Ecosystem Ranking 2015 at http://startup-ecosystem.compass.co/ser2015/

3 Riviera Partners (2015). Engineering Salaries Reviewed. Retrieved September 15, 2015 from http://rivierapartners.com/engineering-salaries-reviewed-2/

But even more concerning, Canadian startups that do prioritize U.S. and foreign customers do not reap the benefits achieved by non-Canadian startups. Why? Interviews with startups and experts from all over the world point to the curse of proximity and shared language. Startups in Canada, banking on a seemingly similar culture and reaching for cost savings almost always make the decision to build their sales and marketing team starting with Canadian executives and employees based in Canada.

In contrast, when entering the U.S. market, startups in Tel Aviv, Berlin, and even the U.K. hire Americans executives and employees based in major U.S. cities. These teams are already part of the U.S. business culture, are a few minutes away from many target customers, and bring a contact list and established relationships with potential customers, salespeople, and partners.

The second of the two root causes of the low Exit Values of Waterloo and Canadian ecosystems is a funding gap, mainly at the seed level (see Section 4.2). Not only do Waterloo startups get merely a quarter of the seed funding amounts obtained by startups in top U.S. ecosystems, but four times fewer Waterloo startups (and about three times fewer Canadians startups) obtain seed funding than startups in Silicon Valley.

Looking at this issue along with the context provided by other factors makes the problem even clearer. The Waterloo startup ecosystem benefits from Canada's great entrepreneurial spirit (rated #2), top technical talent that produce better quality ideas than other ecosystems (according to some experts), and cost less than half as much as they would in U.S. ecosystems. This is a great combination of factors that should lead to more startups deserving seed funding than in other ecosystems. Yet the proportion of startups getting seed funded is several times lower.

Because the attrition rate from seed to Series C funding in Canadian ecosystems is a bit higher than in top U.S. ecosystems, this seed funding gap is clearly an important reason why small proportions of Waterloo and Canadian startups reach a successful exit.

The Waterloo ecosystem also has a gap in local Series A funding, with startups that do not raise money with foreign investors obtaining $2.5 million less than those that do, and average Series A amounts being $2.4 million lower. However, given the 50% lower engineering salaries, Waterloo startups that reach Series A still get a similar if not longer runway than startups in top U.S. ecosystems.

> Canadian startups achieve a slower revenue growth because of their lesser focus on foreign (namely U.S.) customers

The similar distributions of VC investments across rounds from seed to Series D+ for Canadian and top U.S. ecosystems, both in dollar and number, suggests there is no important gap in Series B and later stage funding. This is especially clear when considering the much lower cost of operations in Canada, which more than compensate for the small differences in funding amounts.

In conclusion the root causes for the lower performance of Waterloo and other Canadian ecosystems are, first, a Global Market Reach problem with fewer startups prioritizing foreign customers from the onset and a general hesitation to build growth teams (sales, marketing, and business development) based in the U.S., and second, a major gap in seed funding, which leads to one-fourth to one-third the number of startups making their way to Series A and later stages.

6.2 Recommendations

Before getting to recommendations it is important to understand what drives this report. The central goal is to increase the startup ecosystem's success, thereby creating more jobs and economic growth for the Waterloo Region. Achieving this means accelerating the growth of the ecosystem so it becomes bigger, faster. The questions below, posed by local leaders, are therefore relevant for all small- and medium-sized ecosystems:

"How can we accelerate our growth and possibly become a top 20 or even top 10 startup ecosystem?"

"What can we do to produce the large exits that are the trigger to becoming a global pole of attraction for entrepreneurs and investors?"

This section provides recommendations for new initiatives that may be implemented to address those questions as well as the ecosystem's key challenges. The recommendations are a compilation of well-proven practices and policies executed by other ecosystems that faced similar challenges, as well as new tactics co-created through conversations with various experts from all over the world.

In a fast-moving sector where ecosystems compete for resources on a global scale, ecosystems cannot afford to stand still nor satisfy themselves with repeating what has been done elsewhere. Staying at the forefront of global ecosystems tactics, adapting them but also innovating—and accepting not every tactic will succeed—is the only way for a small- to medium-sized ecosystem or a large one that has fallen behind to accelerate its growth.

As described by the lifecycle model (Section 2), ecosystems first grow from the Emergence phase to the Activation phase through "Catch Up Growth" by importing know-how from top ecosystems in order to make better use of their organic resources.

To then grow to the Integration phase, ecosystems need to produce some success in the form of large exits that make them attractive to external resources, first in their region, then in their whole country. If the ecosystem succeeds in producing many exits including several very large ones, it starts attracting entrepreneurs, investors, and talent from all over the world, propelling it into the most rapid growth trajectory.

Any level of resource attraction has the effect of growing the size of the ecosystem. It becomes large and, relatively speaking, the attraction of external resources has a lesser and lesser effect, i.e. its relative growth slows down and it enters the Maturity phase. In this phase an ecosystem can only accelerate its growth by becoming a bigger pole of attraction for external resources.

Waterloo is an ecosystem in the Maturity phase after having achieved some level of national attraction. In order to accelerate its growth it needs to become an international pole of attraction. The trigger will be many exits including several very large ones, or unicorns, concentrated within a few years, which excite international entrepreneurs, investors, and talent. There is something going on here and you want to be part of it!

So not only are startups that grow to become very large companies directly responsible for the great majority of job creation, but they also act as a beacon for the ecosystem, attracting external resources that foster its accelerated growth. This in turn generates more, larger exits in a virtuous cycle of success and economic impact.

Because the most important challenges for Waterloo and Canadian ecosystems are related to growth and exits, related recommendations have been prioritized ahead of funding.

Increased Growth › More, Larger Exits

The #1 objective of Waterloo stakeholders is to solve the challenges related to growth and the production of more, larger exits. The Performance gap points to Global Market Reach and growth issues as well as Startup Experience issues, essentially the lack of experienced management skills and expertise capable of executing to achieve fast-growth. The key objective is not "more exits", which is related to more startups getting sufficiently funded, but startups with faster growing revenues so more of them reach a higher valuation by the time it is time to exit.

> In order to accelerate its growth Waterloo needs to become an international pole of attraction

1) Support Foreign Customer Development

- **Prioritization**
  First and foremost, entrepreneurs must understand the need to focus on foreign customers from the start of their product and customer development efforts. Entrepreneurs will not execute correctly if they do not understand and believe foreign focus is primordial to their later success, because focusing on foreign customers rather than local ones is much more difficult and costlier. It takes them further out of their comfort zone. Ecosystem leaders can more easily execute on this recommendation than on the following ones, but it must not be neglected.

- **Flying to Foreign Markets**
  This is where the rubber meets the road. For young entrepreneurs, reaching out to customers is the biggest challenge they face. They need to find the right customers to talk to through contacts, events, and online tools; intrigue or excite them with an email or a call; and then they must make a trip to meet with them face to face. Prioritizing foreign customers means all of these activities are more complicated and challenging, and the road is longer.

  Ecosystem stakeholders must work together to make it easier for startups to go through that process. This can mean financial support for individual trips that focus on growth rather than on funding, with support provided directly or indirectly by the government or another organization with vested interest in the ecosystem. It can also mean organizing networking trips to Silicon Valley and New York City to meet with a variety of stakeholders so startups can begin the process of making contacts to be developed later, but also just to break the ice so it is easier for them to do it on their own afterwards. These trips can be organized to cost less and be more productive than trips by individual entrepreneurs.

- **Activating International Canadian Communities**
  Communitech has grown into more than an innovation hub. It has fostered a culture of networking, cooperation, and mentorship which permeates every tech startup stakeholder in the Waterloo Region. The Jewish culture is also known for its high-level of cooperation and support, and it happens between their globally dispersed communities, across oceans and national borders. Tel Aviv tech startups have learned to leverage its global community to effectively reach and penetrate foreign markets.

DutchBasecamp offers another example. It connects the startup ecosystems of The Netherlands and Silicon Valley through a growing network of mentors and set of resources.

Canadians are equally proud of their culture and interested in supporting fellow Canadians. What is needed is a movement to grow the type of cooperation and mentorship that is taking place around Communitech and within the Jewish community in order to catalyze the Canadian community and build momentum for pay-it-forward types of actions between individuals and entities. The C100 in Silicon Valley certainly works in this direction. Leadership is needed to activate the large international Canadian community into building a growing number of interconnected local networks that actively support startup teams across key ecosystems around the world.

These international communities may grow to offer physical hubs, a simple space to network and work from and conduct meetings when on the road. But as Kauffman Foundation's secondary research on the impact of incubators showed[4], a startup space with one or two staff members there to help does not create measurable value. The main objective of the international network must be to connect entrepreneurs with customers, potential employees, experienced advisor and part-ners, investors, and so forth–in other words to be a catalyst for growth-related actions including building a foreign team. It would not exclude facilitating meetings with investors, as, in addition to funding, they also are a valuable source of market and competitive intelligence.

- **U.S. Growth Hubs or FEBAs**
  This ups the ante with a hub and program focused on growth execution, on penetrating foreign markets through a U.S. basecamp, or FEBA (Forward Edge of Battle Area). It is not an accelerator where an entrepreneur learns a lot and executes some, but one focused on execution. Think of University of Waterloo's classroom versus their co-op program, where students learn on the job, executing what they learned in school, in the process learning a whole lot more but more importantly moving the business forward and creating real value. For startups that value is captured in the form of market and industry knowledge, understanding specific customer needs, developing an effective sales process and a local team to execute on it, and, most importantly, signing paying customers.

The growth program of the Silicon Valley and New York FEBAs would be founded on 4 pillars:

1. Startups Ready for Growth: clear selection criteria confirming product/market fit is at hand, such as a $50,000 MRR with double-digit monthly growth rate and sufficient cash to fund an expanding growth program before the next round of financing.

2. Local Experts: a small but experienced team made of Canadians with a significant local network, 5+ years of actual experience as a growth executive for a local startup, and preferably some years working for a local unicorn. Each expert would be able to call on people from their network and the local Canadian community who would help advise, mentor, open doors to the right targets, etc.

3. Well-Defined Program: taking startups from defining a repeatable and scalable sales model to developing an effective sales process and starting to build a local growth team.

4. Measurable and Closely Monitored Objectives: certainly including clear growth objectives as such as closing several sizable new paying customers and/or partners or accelerating revenue growth by x%, and potentially including finding a new office location, hiring a first salesperson, etc.

The program would only host the startup's growth team while the product team remained in Canada.

Each FEBA would also offer some limited yet invaluable services to earlier-stage startups coming to Silicon Valley or New York on shorter (one or two-week long) missions focused on problem/solution or product/market. This would replicate the role international Jewish communities play for Tel Aviv startups. It would offer some support to plan an effective trip including providing contacts and potentially lodging (at least couch surfing) by drawing on the Canadian community's resources. It would allow entrepreneurs to increase the effectiveness and lower the cost of flying to come meet with customers, investors and companies to understand a potential global opportunity.

This program could be sponsored by the government but must be run by experienced startup executives. Running programs in both Silicon Valley and New York City is important because the latter offers a larger breadth of industries. It also comes with the added benefits of being in the same time zone as Waterloo and a much shorter flight away.

> Leadership is needed to activate the large international Canadian community into supporting startups

4 Kauffman Foundation (2015). Are Incubators Beneficial to Emerging Businesses? Emily Fetsch.

2) Increase Local Access to Growth Talent

- **Integration with Toronto**
  Growth happens in large cities where customers are, and that is where experienced, growth-focused individuals can be found, whether in sales, marketing, or business development. Being small, it is not surprising that the Waterloo Region lacks experienced growth talent. Thankfully Toronto is a very large city with a thriving economy and lots of experienced growth talent. Their experience may not be in startups but their relevant experience is with the same markets and customers that startups are targeting. Perhaps this is why many interviewees have highlighted that Toronto residents do not see Waterloo as part of their metropolitan region and much prefer not to relocate. The best performers amongst them do not need to relocate to find a good position. The other problem is transportation. It takes too long to drive from Toronto to Waterloo for commuting by car to be an option.

  A high-speed train would alleviate this issue, and in practice create a shared pool of talent, as much for Toronto startups and tech companies to draw from Waterloo's premier technical talent as for Waterloo's startups to draw from Toronto's experienced sales and marketing talent. This could happen with employees commuting by train or by opening an office in the other city, while making it efficient for product managers to come work with the non co-located team and for joint team work sessions. We further discuss integration issues and ideas in the last portion of this section.

> Canadian startups need a U.S.-based hub or FEBA with a program focused on growth execution

- **Growth Center of Expertise**
  A structure that is popular among large corporations and is finding its way in a slightly different embodiment among top-tier venture firms is the development of a group of experts who can jump in to contribute to growth efforts, rolling up their sleeves to join part of the execution, or solve seemingly insurmountable challenges. Andreessen Horowitz's internal services are similar in that they provide experts in a few functions that can create significant value for their portfolio companies, especially those at an earlier stage who cannot yet afford a complete, experienced team. Large corporations have centers of expertise in their corporate department, serving the businesses of the corporation. These central corporate functions often host the most experienced employees that can be found within the corporation for a given function.

  Communitech and Wilfrid Laurier University may collaborate to develop a growth-focused center of expertise, including growth hacking, sales, marketing, and business development. Similarly to the foreign growth accelerator, this would not have a role of teaching, but of supporting the growth of startups by taking part in the execution along a startup's early growth in short bursts as needed. This means on-the-job training for the startup employees as they team up with the center of expertise to create value, i.e. growth, users, and paying customers. This also means a much more interesting position for the members of the center of expertise. These services could be offered on a fully paid, partially sponsored, or fully sponsored basis depending on the startup's stage or other factors including financial constraints of the sponsoring organizations.

  To some extent, this knowledge gap is already being addressed by the newly established Lazaridis Institute for the Management of Technology Enterprises. However, due to the Institute's core focus on research and teaching, it is advised to enrich it with a radically hands-on initiative that exclusively tackles the key growth challenges of Waterloo-based startups.

More Seed-Funded Startups › Chance for More Exits

The larger funding gap identified in the Waterloo startup ecosystem is the fact that, compared to Silicon Valley, only one-fourth the proportion of startups succeed to raise a seed round—yes, there is a 75% gap in the proportion of seed rounds. Unlike Series B and later rounds, seed funding is very much a local issue that cannot be alleviated by startups flying to the U.S. to satisfy initial capital requirements.

1) Increase Available Capital and Number of Active Angel Investors

- **Government Incentives to Angels: Tax Credits or Matching Funds**
  The success of many startup ecosystems in building a large venture investor community was founded on a government program. The Province of Ontario has successfully built a set of Series A firms just like Singapore did. Building an angel investor community is more difficult and takes more time because it is made of hundreds of individuals acting independently instead of a more manageable number of venture firms.

  The objectives are to first to (a) increase the capital available to seed investments, (b) provide incentives for active angel investors to make more investments, and (c) convert non-active investors into active ones.

Government matching funds directly increase the capital available to seed rounds. Under such program, funds invested by private angel investors are matched by a government investment at a pre-determined ratio, for instance $1 for every $2 invested. Management of the program can be minimized by establishing one or preferably several matching funds managed by a structured group of private angels under the guidance of an experienced fund manager. Spreading the program across several angel groups creates a healthy structure where the preferences and personal biases of one fund do not end up systematically penalizing some startups and favoring others. A multi-group structure may also be used to create a healthy competition if the growth or reduction in future fund allocations to each group is based on their return on investment.

A direct result of matching funds is obviously to increase the amount effectively invested in each startup. Indirectly–because the angels can take into account the matching funds in their investment decision and partially or proportionally reduce their investment into the startup–matching funds also lead to more seed investments made to more startups.

Matching funds provide several benefits over tax credits. First, the government's capital allocation is considered an investment/asset rather than an expense, easing its budgeting process and possibly allowing a larger allocation. Second, the shares purchased by the funds may generate positive returns, further increasing the available capital. Thirdly, they can be pooled into funds under experienced, private fund managers, helping direct the capital towards investment expertise and in turn, to the most promising startups—whereas tax credits are blind to the expertise of the angel investor and to the quality of the startup. Lastly, the cost of managing the program is greatly reduced by passing its operation to the angel group. Tax credits do not confer this opportunity and are therefore much costlier to manage.

The Province of Quebec has implemented a matching funds program in collaboration with Anges Québec. It has been considered effective in increasing angel investments in tech start-ups. The matching funds are funneled into a fund managed by a team of experienced investors. The team can raise other funds and has some discretion as to whether or not to match a specific investment in a startup to the maximum ratio allowed.

> Compared Waterloo to Silicon Valley only one-fourth the proportion of startups succeed to raise a seed round

As Gilles Duruflé, a venture capital and private equity consultant, wrote "success requires not only money, but money coupled with expertise, industry and operational expertise, and deep networks."[5] Anges Québec provides a rich expertise and network while the fund manager's decision-making power "allows the funneling of money to the best investments," Duruflé explained. With the right expertise this can lead to positive returns for the government investment, which can be re-invested later.

Tax credits can also be an effective way to lead individual angel investors to make more investments. Programs making the tax credit fully reimbursable (as opposed to only deductible against taxes paid) are more effective. For instance, an angel investor with $1 million in capital may make 40 investments of $25,000 each. Providing 50% tax credits means $0.5 million will be returned to the investor, enabling him or her to make 20 more investments of $25,000. The investor then receives $0.25 million in tax credits, which can in turn be reinvested. Overall this can double the number of investments as well as ensure dry power remains in the hands of experienced angel investors even as they fully invest their original capital, without having to wait five years–or much longer–for an exit.

Tax credits may also help convert inactive angels into active ones. Every startup ecosystems in the world has stories of angel investors repeatedly showing up at startup pitches and angel group meetings without ever making an investment, or maybe just one investment. They are interested but the risk seems too high–either because they do not have the specific expertise or they want to diversify their investments and their total available capital is just too small to make many $25,000 investments (often the minimum required by a startup). A 50% tax credit would simultaneously cut the minimum investment and risk in half in the eyes of the investor and increase their ability to diversify.

Experts have reported that tax credits have been used successfully by different governments, namely in Wisconsin and British Columbia.

Reassignment of Government Budgets Allocated to Grants and Loans: matching funds and tax credit programs offer many benefits over grants and loans. First the investment decision is made by a private investor who has direct personal incentives in making a good decision, in trying to help the startup in any way he or she can, and in learning to make better and better investment decisions over time. Secondly they remove

5 Duruflé, Gilles (2012), Will Canada Ever Get Venture Capital on Track?, Institute for Research on Public Policy, Policy Options, September 2012.

the costly layers of bureaucracy, both for the startup having to apply for the loan or grant and for the government. Thirdly, they support a thriving private investor community while government grants and loans do not.

Integration with Angel Communities in Toronto and other Ecosystems

Large angel groups with several satellites can promote pitches by the best startups to angels from several of their locations. Waterloo's angel community could be connected to Toronto's, and even potentially Montreal's and Ottawa's angel communities, increasing access to more angel investors by all startups.

> The endeavor to build a globally-competitive venture capital community needs to accelerate rather than slow down

Better Funded Startups › Faster Growth & More Exits

The second most important funding gap relates to seed funding amounts: seed round amounts are lower (25% lower average and 76% lower median) and there are fewer large seed rounds. Local Series A rounds are also lower than in the U.S. unless the startup's performance is such that it can attract U.S. VC firms despite their reticence to invest in foreign startups.

These issues put Waterloo startups at a disadvantage when racing against U.S. startups to capture a global market opportunity.

1) Foster Larger Seed Rounds

- **Government Incentives to Angels: Tax Credits or Matching Funds**
  The programs discussed above can lead to an increase in average seed round amounts as angel investment amounts are increased by matching funds or if an angel, knowing a tax credit will be received, decides to proportionately increase the amount of the investment. Also, if a program successfully leads to more high net-worth individuals becoming angel investors and to existing angels becoming more active, this can lead to more angels participating in each round and therefore larger seed rounds.

- **Integration with Angel Communities in Toronto and Other Ecosystems**
  Access to investors in Toronto and other ecosystems can also lead to larger seed rounds through more angels participating in each round and increased access to larger investors in other ecosystems.

- **Government as LP in Local Super Angel Funds**
  The top 4 U.S. ecosystems have had a thriving investor community for many years, and with that came the development of specialized investors. Those were developed around financing needs that were unmet by the traditional venture capital industry. One of those is the gap between seed and Series A rounds, which not so long ago made it almost impossible to raise between $1 and 3 million. That was before a few innovative investors such as Mike Maples, Jr. (now Floodgate) identified the gap and set out to fill it by creating a category of VC firms that is now called super angels. They are one of the main reasons why top U.S. ecosystems see a portion of seed rounds exceeding the $1 million threshold and with them, higher average seed round amounts. That category of firms is mostly missing from the Canadian investment landscape.

  Similarly to what it did to successfully foster the creation of more local Series A venture funds, the Province of Ontario (or the Federal Government) can develop a program targeted to the creation of super angel institutional venture firms. The government's LP investment would be limited to the creation of new funds targeted at filling the gap between the $1 to 3 million investment range.

  These LP investments can also be used to attract U.S. super angel firms (or larger VC firms active in that investment range) to open a local office. We discuss this policy in more details below.

- **Encourage Series Seed Club Rounds**
  Another practice that has gained popularity in top U.S. ecosystems is Series Seed club rounds. They also fill the $1 to 3 million gap by allowing Series A VC firms to make a smaller investment in a startup using a standardized preferred stock agreement with conditions favorable to the startup (see seriesseed.com). This way venture firms can get into a promising startup earlier than they normally would by putting in $100,000 to $750,000 along with a few other VC firms and several angels. For the startups, the participation of VC firms often translate into angels who were on the fence deciding to invest, and others deciding to invest more as the VC firm acts as a stamp of approval for the investment opportunity and its structure (valuation, conditions, etc). It also means a larger injection of capital and a burgeoning relationship with a few VCs without the legal fees and constraining conditions attached to a Series A round.

  Ecosystem stakeholders in Waterloo and Toronto (entrepreneurs, investors, and possibly the leaders of Communitech

and MaRS) would have to educate themselves on the structure and benefits of this type of round and promote its use. This would mean a Series A firm being opened (and asked by the entrepreneur) to convert a "maybe" or "yes but we will not lead" into a $250,000 investment into a Series Seed club round. This would increase the number of larger seed rounds and accelerate the growth of the most promising startups that find themselves making rapid progress and needing more than $0.5M in capital but are not quite ready for Series A.

2) Continue to Grow the VC firm community

- **Government investment as LPs in new and existing VC firms**

The small number of local VC firms and the smaller average size of those firms compared to U.S. ones is the root cause of the Series A funding gap. The gravity of this gap will grow as the seed gap is closed, especially in terms of increasing the number of angels and the number of seed rounds so a higher proportion of startups (4 times more) get seed-funded. Considering that there is currently not enough local VC firms to satisfy the Series A funding needs of both the Waterloo and Toronto startup ecosystems (the attrition rate is close to that of top U.S. ecosystems only because many local startups get funded by foreign VC firms), it is clear that the endeavor to build a globally-competitive venture capital community needs to accelerate rather than slow down.

The Province of Ontario and its startup ecosystems will greatly benefit from the renewal of its LP investment program into both new and existing VC firms. The latter is required to generate larger and larger local funds capable of competing with U.S. funds by offering larger amounts and valuations to the best local startups. This in turns keeps the higher returns provided (on average) by those higher performance startups into Canadian VC funds, increasing the returns to their LPs and motivating those existing investors plus new ones to funnel more capital into their next generation funds…rather than less if those top tier startups are financed mainly or entirely by U.S. firms. The structure used by Israel shall be given more attention: instead of the government picking VC firms in which to invest in and how much to invest, it calls for investing $4 in a given VC firm for every $10 private investors have made the decision to invest in that firm. This again uses the expertise of private investors and their vested interest in protecting and maximizing the growth of their capital through their good investment decisions.

- **Government incentives to keep or grow private LP investments in VC firms**

Just like it happens in Silicon Valley, a portion of Canadian VC firms inevitably deliver underperforming returns to their investors. This affects these (and other) investors' confidence in the asset class and can lead to them withdrawing their capital from venture firms partially or entirely. While not rewarding the underperforming firms with renewed investments is healthy, the government may gain in providing tax benefits for investors to keep or increase their investments in venture capital firms. The power of this formula is that a small change in tax rate may compensate for lower expected returns and have a large impact in terms of funneling more private investments into local VC firms than the government can make as LP under the above recommendations.

- **Government incentives to attract foreign VC firms to open a local office.**

Attracting foreign VC firms has many benefits for an ecosystem. They bring a wealth of experience with them about VC firm processes, the latest business models, industry insights and relationships that can make a difference for a startup to grow into the U.S. market. The government could reserve a portion of any capital and budget (tax credits) assigned to growing the local VC community to this objective, with the same structure as programs for local firms, plus one condition. The requirement is for the firm to have one U.S. partner move to Canada and to hire hiring one Canadian partner. This way the expertise of the firm is truly brought to Canada and transferred to a local partner who is more likely to have long-term roots in Canada.

Increased Startup Experience › Higher Performance Startups

Gaps in this index correlate strongly (and had a high causal relationship in our mathematical model) with lower ecosystem and startup performance. In fact Startup Experience is correlated as strongly with Ecosystem Performance as the Funding Index is. Waterloo's Startup Experience Index was equivalent to a top 20 ranking. While not dramatic there is much space for improvement. The issue explaining that lesser presence of experience is the lack of large exits which first offer "on the job training" to their leaders then, release those experienced startup leaders into the ecosystem. Therefore a long-term solution is to solve the Market Reach gap in order for the ecosystem to produce faster growing startups in the medium and long term.

> Government incentives are needed to attract foreign VC firms to open a local office in Canada

1) Attract Secondary Offices of Successful Tech Companies

- **Active Program Supported by Local Stakeholders**
  Another way to grow local startup experience–one that will have a much faster impact–is to attract large, successful technology companies to open a secondary office in the Waterloo Region. In addition to increasing the level of startup experience in the region, this immediately creates more technology jobs in the city, thereby increasing the retention of the top technical and non-technical talent produced by local universities. The many advantages offered by Waterloo, such as its top tier technical talent, low operating costs, and low salaries (two-thirds or more lower when considering potential R&D tax credits), and the growing presence of Google and other large tech companies will go a long way in motivating tech company leaders to pay a closer look to Waterloo as a potential location. Local stakeholders can all work formally and informally on attracting more tech companies. If the government can add tax incentives to sweeten the opportunity for interested technology companies, these efforts could lead to the Waterloo region being recognized internationally as a premier tech city, in addition to greatly increasing local startup experience.

> Faster transportation is the main issue holding back a true Toronto-Waterloo integration

Integrated Toronto-Waterloo Startup Ecosystem › Bigger, Better Ecosystem

Because bigger is better in terms of startup ecosystem, an integration of Toronto-Waterloo would clearly benefit both ecosystems. The short geographical distance (70 miles) between Waterloo and Toronto, makes it possible to create a much closer integration between the two ecosystems.

With a combined metropolitan GDP of about $350 billion–the 10th largest in U.S. and Canada–the corridor has the assets to compete on the global stage.

As Iain Kulgman, CEO of Communitech, and Kevin Lynch, vice-cair of Bank of Montreal wrote, "the Toronto-Waterloo corridor is home to 30% of Canada's university students and 21% of the country's population, as well as the majority of its corporate headquarters, Canadian industry-led R&D spending, and venture capital."[6]

The example of Cambridge and London (see Section 5.2) provides valuable insights about a possible integration. A similar distance as Waterloo-Toronto separates these cities, yet they more closely share resources and successes. The assertiveness of their plan for greater integration and the size of their financial commitments are inspiring.

Faster transportation is the main issue holding back true integration. Several interviewees indicated that improving the frequency and speed of the train connection would be the best option since the Ontario Highway 401 is one of the busiest highways in the world, making it a nightmare for commuters. The current public transportation options are equality inefficient due to low frequencies and slow speeds of bus and train connections.

It is equally important to create a joint sense of community. This can be done by proactively seeking to bridge the investor, entrepreneur, and talent communities through events organized jointly by MaRS and Communitech. Startups should be encouraged to learn about activities and get connected to both ecosystems.

Additionally, like The Netherlands with its StartupDelta effort, it will be helpful for ecosystem leaders to develop an agreed upon brand name for the corridor and popularize its use through all internal and external communications.

Finally, to realize the untapped potential of a merged Toronto-Waterloo innovation corridor, a concerted effort driven by key stakeholders–from leading entrepreneurs to investors and policy makers–will be needed.

6 Klugman, Iain and Lynch, Kevin (2015). Toronto-Waterloo corridor could be Canada's own Silicon Valley. The Globe and Mail Inc. August 19, 2015. Retrieved on October 27, 2015 from http://www.theglobeandmail.com/report-on-business/rob-commentary/toronto-waterloo-corridor-could-be-canadas-own-silicon-valley/article26006973/

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8

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Thank you for your support!

Partners and Collaborators

Global Partners

CrunchBase: Everyday investors, journalists, founders, and the global business community turn to CrunchBase for information on startups and the people behind them.

Dealroom is a data-driven marketplace for private capital, providing direct and secure access to the world's most sophisticated investors.

Global Entrepreneurship Network is a year-round platform of programs and initiatives created by the communities that celebrate Global Entrepreneurship Week each November.

Microsoft Ventures is a global initiative empowering entrepreneurs around the world on their journey to build great companies. We work with startups at every stage of maturity to provide the tools, resources, knowledge and expertise they need to succeed.

Orb Intelligence provides business information for B2B Marketing and Sales. Orb provides company information and smart algorithms as a service to marketing software vendors and B2B agencies.

Startupbootcamp is a global network of industry focused startup accelerators. We take startups global by giving them direct access to an international network of the most relevant partners and investors.

Regional Report Partners

This Waterloo report has been developed in partnership or collaboration with the following organizations:

Communitech
Communitech is an industry-led innovation center that supports, fosters and celebrates a community of nearly 1,000 tech companies. They support companies at all stages of growth and development—from startups to rapidly-growing mid-sized companies and large global players—and have fun doing it.

University of Waterloo
Consistently ranked Canada's most innovative university, University of Waterloo is home to a wide range of advanced research and teaching. From quantum computing and nanotechnology to clinical psychology and health sciences research, Waterloo brings ideas and brilliant minds together, inspiring innovations with real impact today and in the future.

Wilfrid Laurier University
Wilfrid Laurier University is devoted to excellence in learning, research, scholarship, and creativity. It challenges people to become engaged and aware citizens of an increasingly complex world. It fulfills this mission by advancing knowledge, supporting and enhancing high-quality undergraduate, graduate, through professional education, and by emphasizing co-curricular development of the whole student.

BDC Capital
The largest and most active early-stage technology venture investor in Canada, BDC Capital works with promising entrepreneurs and private sector investors to build outstanding Canadian companies.

Region of Waterloo

City of Waterloo

City of Kitchener

Upcoming Regional Reports

Australia
Deloitte is the brand under which thousands of professionals collaborate across a network of offices in Australia to provide audit, economics, financial advisory, human capital, tax and technology services.

Belgium
iMinds inspires and trains people to turn their innovative ideas into successful businesses. iMinds' Incubation & Entrepreneurship programs connect (future) entrepreneurs and researchers.

Estonia
Eesti Arengufond/Estonian Development Fund is designed to support the positive changes in Estonian economy, investment activity, and growth programs.

Hong Kong S.A.R.
InnoFoco is working at the interface of the private, public and nonprofit sectors, InnoFoco is a network of catalysts who aspire to make a meaningful difference to the world, with expertise in branding, design, and innovation.

The University of Hong Kong (HKU) is the oldest institute of higher learning in Hong Kong and also an internationally recognized, research led, comprehensive university. HKU strives to attract and nurture outstanding scholars from around the world through excellence and innovation in teaching and learning, research and knowledge exchange, contributing to the advancement of society and the development of leaders through a global presence, regional significance and engagement with the rest of China.

India, Chennai
MaxBlox is the provider of a Platform-as-a-Service (PaaS) enabling startups and independent software vendors to build, deliver, market and sell their ideas to the world.

Local Ecosystem Partners

Multiple Ecosystems
Built In is a global network of online communities for technology companies and startups. Headquartered in Chicago, USA, Built In operates Built In Chicago, Built In L.A., Built In Austin and Built In Colorado.

Techstars is a global ecosystem that empowers entrepreneurs to bring new technologies to market wherever they choose to build their business. With 18 mentorship-driven accelerator programs worldwide, Techstars exists to support the world's most promising entrepreneurs throughout their journey.

Amsterdam-StartupDelta, Netherlands
StartupDelta tackles challenges that hinder the growth of startups. It closely collaborates with the 10+ tech hubs to make the Netherlands the largest startup ecosystem in Europe.

The Startup Foundation is an independent non-profit, run by entrepreneurs, for entrepreneurs. They support founders in building more successful startups.

Atlanta, USA
Fueled by the same entrepreneurial spirit that drives the folks we cover, **Hypepotamus** generates awareness about Atlanta's innovative tech & creative community to retain local talent by connecting them with opportunities.

Austin, USA
Techstars: see "Multiple Ecosystems" above

Central Texas Angel Network is committed to provide startup capital and business mentorship in order to increase companies likelihood of success to the maximum extent possible.

Bangalore and Delhi, India
Microsoft Ventures: see "Global Partners" above

TLabs is India's leading tech startup accelerator and early stage seed-fund focused on internet and mobile. Powered by a panel of 100+ mentors, TLabs has invested in 43 startups in its last three years of existence.

Barcelona, Spain
Barcelona Activa integrated in the Area of Economy, Enterprise and Employment, is the executive tool of the Economic Development policies of the Barcelona City Council.

Berlin, Germany
Gruenderszene is the online magazine with the hottest stories about and for the digital economy in Germany.

TechBerlin believes that entrepreneurship is a force for good and that a thriving startup community is essential to nurturing entrepreneurship. We're building a platform to support the community, a place where it shares news, events and resources.

Microsoft Ventures: see "Global Partners" above

Boston, USA
TechHub is a unique environment where technology startups can start up faster. We nurture an international network of like-minded and focused tech entrepreneurs, providing places where they can work, meet, collaborate, network, learn and have fun. By getting the right people together in a physical space, good things happen.

Techstars: see "Multiple Ecosystems" above

Chicago, USA
1871 is Chicago's entrepreneurial hub for digital startups. Come to a place where you can share ideas, make mistakes, work hard, build your business and, with a little luck, change the world. Welcome to 1871.

China
InnoSpace is a leading incubation platform with its own angel fund in Shanghai, offering a total solution for global entrepreneurs ranging from capital raising, market/business development, HR solutions and technological guidance.

IPV Capital is a venture capital firm dedicated to delivering exceptional investment performance to early stage, high-growth technology firms in China. IPV brings together people, capital, and ideas to help realize the next great technology leaders of tomorrow.

Denver/Boulder, USA
Techstars: see "Multiple Ecosystems" above

Dublin, Ireland
The Dublin Commissioner for Startups is an independent office promoting Dublin as a global tech hub for startup and scaling companies, supported by Enterprise Ireland and Dublin City Council.

Jakarta, Indonesia
Kejora is a tech business incubator. They focus their investments on early stage startups related to telecommunication, media, and technology sectors.

Kuala Lumpur, Malaysia
MaGIC's mission is to catalyze the entrepreneurial ecosystem in Malaysia, bringing together the abundant resources from partners and communities alike.

AIM lays the foundation of innovation that inspires and produces a new generation of innovative entrepreneurs by creating wealth through knowledge, technology and innovation; with a mission to stimulate and develop the innovation ecosystem in Malaysia towards achieving Vision 2020.

MDeC's mission is to spearhead the nation's digital economy by enhancing Malaysia's status as a global hub and preferred location for ICT industries; and to catalyze a holistic ecosystem that promotes the pervasive use of ICT and connected communities.

London, UK
Centre for Entrepreneurs promotes the role of entrepreneurs in creating economic growth and social well-being. The Centre is an independent organisation chaired by Financial Times columnist and serial entrepreneur Luke Johnson.

StartUp Britain is a national campaign by entrepreneurs for entrepreneurs, harnessing the expertise and passion of Britain's leading businesspeople to celebrate, inspire and accelerate enterprise in the UK.

Los Angeles / Orange County, USA

Cross Campus is the leading collaborative workspace and business event venue in L.A. With a superior design & user experience, best-in-class event programming and execution, and a diverse community of innovative members, it has become known as "the nerve center of Silicon Beach."

Mucker Capital is the leading pre-seed and seed stage venture fund based in Los Angeles.

Techstars: see "Multiple Ecosystems" above

Montreal, Canada

The International Startup Festival puts a new spin on entrepreneurship each year with content ranging from back-of-the-napkin ideas to champagne-popping exits.

Moscow, Russia

#tceh brings together startups, experts, and investors. It is a new form of infrastructure for business development, providing structure and expert advice to IT coworking.

Internet Development Fund initiatives (IIDF) provides funding and expert resources, as well as acceleration programs, for online startups in the early stages of development.

Russian Venture Company (RVC) is a government fund of funds and a development agency aimed at building a national innovation system in Russia.

New York, USA

DreamIt is an accelerator programs providing synergistic innovation models that assist companies—from startups to multinational corporations—in de-risking their businesses quickly and cost effectively.

Rubicon strives to deliver real value through our extensive global network of institutional limited partners, angels, and advisors. Got challenges? We've got seasoned entrepreneurs and industry leaders ready to go to bat for you.

Paris, France

France Digitale is an initiative to help startups and investors join forces to create the French digital champions.

NUMA combines co-working, startup acceleration, events, and open innovation programs for companies, startups and communities at large.

TheFamily nurtures entrepreneurs through education, unfair advantages and capital.

50 Partners offers mentorship for innovative young startups, resources and expertise through an established network of successful entrepreneurs.

Rome, Italy, INcube

INcube is at the "Convergence Point of Innovation"

Santiago, Chile

Start-Up Chile's goal is to increase the number of customer-validated and scalable companies that will leave a lasting impact on the Latin American ecosystem.

SSao Paulo, Brazil

The Brazilian Startup Association (ABStartups) is a nonprofit entity that has more than 3,000 startups registered and the mission to promote the Brazilian entrepreneurship market globally.

Start-Up Brazil is a national program for startup acceleration, a federal government initiative created by the Ministry of Science, Technology and Innovation (MCTI) with Softex, in partnership with Brazilian accelerators.

The Startup Farm is the bridge between entrepreneurs and the success they seek, supporting them through our accelerator program and other initiatives.

Seattle, USA

Microsoft Ventures: see "Global Partners".

TechAlliance leverages and implements industry leading enterprise solutions to help you rise above your competition.

Silicon Valley, USA

GSVlabs is a global innovation accelerator that supports the growth of talent, startups, and corporate partners.

Startup Grind is a global startup community designed to educate, inspire, and connect entrepreneurs. We host monthly events in more than 150 cities and 65 countries featuring successful local founders, innovators, educators, and investors.

Singapore

Startups, Technology and Asia. Infocomm Investments brings them together.

Tel Aviv, Israel

Start-Up Nation Central is inspired by the story of how Israel made the leap from being an isolated nation to an international innovation powerhouse SNC will plug you in the heart of Israel's innovation ecosystem.

Startup Package Partners

To reward participants of our online survey, multiple great companies agreed to offer huge discounts on their product:

New Relic is a monitoring software for your web or mobile application. Once you have your first product up and running, it saves you a lot of pain and frustration.

Zendesk is a customer support application. Being responsive and in touch with your customers makes a big difference no matter in what stage your company is.

Olark is a lightweight chat tool that you can integrate on your site or application within a few minutes. It's great for engaging and learning from your customers right when they use your product.

Close.io is a intuitive CRM with integrated calling, emailing, and search capabilities. You can get setup and start calling within minutes. Close.io also offered their guides on Outbound Startup Sales and Inbound Startup Sales.

Pipedrive is a low-cost multi platform CRM for small teams. It has great reporting and sales forecasting.

Iron.io is a hosted message queue service that is at the core of many modern web applications.

Wix is a website builder for quickly testing new value propositions with professionally looking websites and landing pages.

Foundersuite is a comprehensive compilation of tools and legal documents to help early startups get off the ground.

Survey Promotion Collaborators

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