

**CUSTOMERS IN DEVELOPING MARKETS: SOME OF ITS IDYOSINCRATIC
IMPACT ON INNOVATION ECOSYSTEMS**

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Abstract

This work investigates problems in emerging markets associated with customer acquisition by startups. I analyze two sets of interviews, including a novel set aimed at technology adopters in the Chilean agriculture.

This question is relevant because research, in the author's opinion, has slowly been drifting towards a more customer-based approach to innovation fostering and start-up formation. Works have started to see this as complementary to improving the supply of innovations in a market by helping entrepreneurs or researchers or increasing the investments made in the area. I introduce a framework for thinking about these issues and by analyzing two sets of interviews, I conclude that client-acquisition particularities greatly affect the venture capital industry and structure. These structural differences from emerging to developed innovation ecosystems are; more entangled relationships along the capital deployment structure, longer product development cycles and a particular self-selection pattern amongst new ventures.

Introduction, framework and literature review

Startups, innovation and their importance

The relevance of new venture formation and innovation as a public policy problem is well established in the academia and in the real world. In the academia, Lerner¹ has made a very compelling argument as to the reasons why innovation in an economy seems driven by smaller ventures. Works by Christensen² and the Ewig Marion Kauffmann foundation³ show the relevance in the aggregate numbers and from a logical standpoint. New companies bring in new technology, create jobs, and spur economic growth. Besides these examples in the academia, in the real world programs like Start-up Chile or newly adopted tax-breaks for venture capital firms in Israel⁴ show a never-ending thirst from governments and other institutions for startups and the innovation and changes that they might bring to an economy. In the next lines, we will do a small review of some of the work done in these lines. The main purpose is to underscore the relevance of small ventures from an economical point of view. Later, we will refer to many of the same works in the extent that they approach innovation from very different angles and why do they approach it from different angles.

Josh Lerner in *Boulevard of Broken Dreams* summarizes part of the relevance of innovation from small companies in modern economies. As it is to be expected, the author, backed by a several scholarly articles, explains why innovation, especially that coming from smaller companies, is an important engine of development, even more so than innovation from

¹ Josh Lerner, *Boulevard of Broken dreams* (Princeton: Princeton University Press, 2009) 63-79

² Clayton Christensen, *The Innovators Dilemma* (Harvard business Press, 1997)

³ Ewig Marion Foundation, *The Importance of Startups in Job Creation and Job Destruction* (Firm Formation and Economic Growth Series, 2010)

⁴ Steve Sheer, *Israel to expand tax breaks to boost investment in start-ups*, last modified July 16th, 2014. <http://www.reuters.com/article/2014/07/16/israel-taxbreaks-tech-idUSL6N0PR3DI20140716>

larger companies, and has been so in the United States for the last decades or century. It is important to underscore that the ultimate *origin* of this innovation is not clear. This means that ultimately the creator of this or that innovation might originally come from a research institute or a larger company, but the stress is in the fact that the economic growth and the entrance in the market is done from a very small company as opposed to a larger incumbent.

In “The innovator’s dilemma,” Clayton Christensen writes a very compelling argument along the same lines. This work is not as rigorous as what we can see in Lerner’s book: Christensen presents a series of case studies, pointing to the basic fact that incumbent companies yield to newcomers under certain circumstances.

The basic mechanism that gives this result is simple and twofold: First, incumbents become more and more customer centered. They concentrate on margin measurements of success and as a result, move up the value added road trying to capture more and more sophisticated customers. Second, a new comer enters the market by offering a rudimentary product to the base of the customer pyramid, the part that the incumbent does not care about. With time, the technology becomes better and ultimately it pushes the incumbent out of the market by taking all of its customers.

The logic behind Christensen’s argument is very compelling because it indicates that at least in a particular type of innovation, which includes hard-disk drives, excavators, steel mills and even education, market dictates that it is new-comers and startups the ones that will take the lead and improve technology, increasing productivity and moving economic growth forward.

Adding to the literature review in this topic, a study by the Ewig Marion foundation found that between 1977 and 2005 incumbent companies were net job *destroyers*, and new ventures created jobs in all but 7 years of the sample. This means that not only new ventures

and new technologies bring in increases in productivity, but also create jobs and could potentially spread the wealth created by this newfound productivity.

A couple of words of advice to these results. First, many other effects might be making the impact of new ventures in the economy negative. For example, the lost jobs in the incumbent companies might be a result of new ventures taking customers from these companies, so the gains in employment could be zeroed out or negative. Second, many times these studies refer to smaller portions of the economy, as with case studies by industry or only in Silicon Valley. Finally, all of these studies are about the US. The largest companies in the United States were far from incumbents 100 years ago; Apple and Google did not exist. However, in other countries, like Germany, the largest companies have been incumbents since the industrial revolution, like in the cases of Siemens, BASF or Thyssen-Krupp, or at least since the invention of the automobile, like in the cases of Volkswagen and BMW.

The innovation and startup problem

In a classical definition,⁵ an innovation ecosystem is comprised of two sets of agents in two complementary economies: There is the knowledge economy, which includes basic research, students, universities, research institutes and is mostly backed-up with public money. The other is a market economy, with customers, venture capitalists and entrepreneurs who use spillover from the knowledge economy and create wealth from it. These two sets of agents remain quasi-public and quasi-private because of economic reasons; the state can invest in basic research because it does not require immediate returns from its developments, private players can't really do it themselves because the spillovers from their work might not be directly applicable to their own economic activity.

⁵ Deborah Jackson, *What is an Innovation Ecosystem* (Arlington: National Science Foundation, 2008).

The chicken and egg problem that characterizes innovation ecosystems and new venture formation has been stabbed at from many different angles. We will frame these approaches under a very specific and simple framework, and will go on by analyzing what do these approaches mean and what do they achieve.

A framework to look at innovation in new ventures

If we look at venture formation and innovation from a simplified economic perspective, we can separate the problem in a simple agent problem, with demand, supply and investment as being the main playing fields or variables. The players defined in this framework are only three: The entrepreneur as a representation of the supply side of the equation, the venture capitalist representing the investor, and finally the customer representing the demand.

We can translate public policy into this framework by saying that they are incentives to the conduct of any of these agents. Say, a new law that reduces penalties to the entrepreneur or Venture Capitalist because of bankruptcy, will increase the supply of innovations and of capital. Better consumer facing policies will make them feel safer and increase demand, etc.

In the same vein, a cultural approach, say, risk-aversion by the entrepreneurs in a particular country, or a low cultural value given to those who start their company, can be interpreted as a higher barrier for the entrepreneurs.

As another example, we can also interpret the value of networks under this framework: If sharing information between entrepreneurs is easy and forthcoming, there will be less information asymmetry, more competition will ensue, supply will increase, and more and better products will reach the hands of the customers.

The key about looking at these phenomena through this approach is to realize that it depends on equilibrium. We need these three pillars (supply, demand and investment) to work at the

same time and we need the three of them too feed each other in some sort of virtuous circle.

What we do not know is what are the key amounts of each ingredient to kick-start this virtuous circle to a desired equilibrium state. If there is not enough *demand* for innovation, our PhDs and innovation institutes will work for nought and end-up driving taxis. If we do not have enough *supply* of innovation we will have VCs with idle capital sitting in their hands and limited partners nervously calling their GPs asking for their money back.

Approaches under this framework

We will separate the literature by approach taken under the light of the framework we have just presented. That is, we will look at authors who explain innovation ecosystems and classify them under the *supply, demand or investment* pillar. Many of them might fall in more than one pillar or be a subset of one of them. As we talk about each of these pillars and the literature that takes care of them, we will summarize the frameworks in the literature and add them to our own framework as in sub-frameworks.

The supply side of the equation – Something ventured

First, we have those who approach the framework from the supply side of the equation. They think that the key is, mainly, more entrepreneurs, more incentives to entrepreneurs, more scientists that create innovations that are marketable, better communication or idea flow between those who create and those who market, creating an easier way out for those who entered a market and then had problems (bankruptcy), etc.

If we go back to our classical innovation ecosystem definition, we might remember that it was defined by two economies: one quasi-public and one quasi-private. We apply this definition to a sub-framework for the supply side of the innovation economy: The push side of

the equation, the traditional understanding of innovation is on the quasi-public side of the equation, the pull side is on the private side. The playing field is public and private, with laws (government) and cultural definitions (private sphere) that enable or disable entrepreneurs to venture something.

From a traditional standpoint, this is what has been believed to be the key to innovation in general. Knowledge has been seen many times as an objective unto itself, and little value was placed in education or higher education as part of economic growth and general societal advancement. Since the enlightenment, governments and private actors took in to funding basic and advance research even without taking into consideration what might come out of these efforts. This approach to the supply side of innovation is mainly a “push” approach. It works under the belief that mainly innovation comes about because of a large existing corpus of knowledge from which society draws as it sees fit.

However, this is only part of the equation. Much knowledge has been accumulated to no avail and many times innovation has come from outside universities and labs, In academics, from the public policy side, works by Lerner, Saul⁶ and others have underscored the importance of creating a fostering environment for entrepreneurship and start-up formation by giving the right monetary and legal incentives to entrepreneurs. In the real world, we have seen attempts in programs like Star-Up Chile⁷ and venture capital tax-breaks in Israel and legal framework changes in Mexico and Brazil.

There are other approaches that concentrate mainly on the supply side of the framework we have just proposed. Drori⁸ espouses the genealogical approach, which can be traced back to Alfred Weber, in *The Evolution of an Industry*. Here, the particular skills acquired by

⁶ Dan Senor and Saul Singer, *Start-up Nation* (New York: Grand Central Publishing, 2009).

⁷ Melisa Boehm, *Far from Silicon Valley* (Philadelphia: Lauder Global Knowledge Lab, 2014).

⁸ Israel Drori, *The Evolution of a New Industry: A Genealogical Approach* (Innovation and Technology in the World E) (Stanford: Stanford University Press, 2013).

individuals inside of an organization are key to initiate new ventures, which eventually, will create more new ventures that will spin-off further companies. This approach is believed by many to also be the key for the growth of the Silicon Valley ecosystem. It is a very popular way of focusing on the subject, for one thing, because it is so people-centered it makes for great documentaries, like “Something Ventured” or biographical movies like “Jobs” or “Pirates of Silicon Valley.”

On a more cultural vein works by Guillen⁹ Et al. and Pines¹⁰ Et al. Focus on the barriers that entrepreneurs themselves find when trying to build their own venture. They might be shortchanged by the society they come from, or by how society looks at entrepreneurs. We will review these works in the next lines in the form of literature review. The point is to underscore the supply approach that these works take under the view of the proposed framework.

First, Lerner makes it very clear in the structure of “Boulevard of broken dreams” what he believes to be the main reason for failure of entrepreneurship ecosystems. Before he delves deep in to the investment side of our framework, he has a whole chapter dedicated to “The neglected art of setting the table” In this chapter the legal framework comes to the forefront.

The enormous difficulties that some legal frameworks pose to entrepreneurs are seen as problematic, and as such, they must be taken care of. This view has made its way into some questions of the Global competitiveness report by the World Economic Forum.¹¹ In this index, a question asked to the legal experts is plainly about how long does it take to come out of bankruptcy, as opposed to whether there is some relationship between this time-length and the nature of the bankruptcy or bankrupt company.

⁹ Mauro Guillen, Leora Kappler and Rafael Amit. “Entrepreneurship and Firm Formation across Countries” *International Differences in Entrepreneurship* (2010) 129 - 159..

¹⁰ Malach-Pines Ayala, Levy Haim, Utasi Agnes, T.L. Hill, (2005) "Entrepreneurs as cultural heroes: A cross-cultural, interdisciplinary perspective", *Journal of Managerial Psychology*, Vol. 20 Iss: 6, pp.541 - 55

¹¹ WEF, *The Global competitiveness Report* (WEF2014, 2014).

In the real world the attempts to push from the supply side have been multiple: An example from Chile is the extraordinary push by helping entrepreneurs from the government since 2010: Startup Chile offers \$40K grants to participants, other groups such as Fundación Chile, Wayra Chile and some 8 universities have launched seed accelerators that take equity in participating startups and establish market terms for early-stage companies. Social Lab, helps launch social impact companies, which have now raised \$2M in capital. The programs are motivated by strategic objectives as opposed to returns, which points to the idea of “kick-starting” this virtuous cycle, as we mentioned when we introduced the framework.

In the genealogical approach, we see many standard-bearers. Here, new venture formation based on innovation relies heavily on companies that create entrepreneurs. In their book, Druri et al. concentrate on the telecommunications industry in Israel and show how companies are spun-off, one after the other from original mother-companies. By way of interviews a point is made that the culture of the company, originally seeded by the founders, is responsible for creating employees who later become entrepreneurs. This is mainly a supply approach: A set of skills is given to the entrepreneurs who later are able to initiate their own ventures, hence, the supply improves.

Other proponents of this approach, from a more American point of view, stress the network-effects related to innovation ecosystems, although many of these network effects are related to existing past working relationships. In this side of the field we see entire not-for-profit companies, like Endeavor,¹² which have gone to the extent of editing work on networks among companies in innovation ecosystems in cities in the US and Latin America. Also considering Israel, the Saul and Singer book “Startup Nation” stresses networks created in the

¹² Yael Hochberg, Alexander Liunqvist and Yang Lu., *Whom You Know Matters: Venture Capital Networks and Investment Performance*. (The Journal of Finance 2007), 62: 251–301

military as key, but only to the extent that they allow these former comrades in arms start new companies from the ground up.

In addition, there is a set of structural cultural and psychological approaches to the supply side of entrepreneurship. For example, in “Entrepreneurs as Cultural Heroes,” three countries are compared in order to find out to what extent entrepreneurs are seen as cultural model (looking at their status and number). For this, the authors pick four criteria: power distance, individualism, masculinity/femininity, and uncertainty avoidance (risk aversion). The study concludes with the proposition that if a culture values entrepreneurs as heroes, this will be reflected in a more active entrepreneurial behavior (more supply in our framework).

Finally, in “Entrepreneurship and Firm Formation across Countries” from Guillen, Klapper, Amit and Quesada go all in for the sub-framework inside the supply side of the equation. They find a series of covariates to entrepreneurship in lending, formality and classical measures that are normally also related to good working institutions in a working democracy. The authors posit that robust lending to smaller companies and low barriers to entry are positive for entrepreneurship. They explicitly mention the “Ease of doing business”¹³ ranking as a variable that might be highly correlated to this very phenomenon.

As we saw in this section, the supply side of the innovation and small business formation equation can be very convoluted. There several approaches to entrepreneurship and small firm formation that point to the supply as key. First, there is a traditional view of creation of knowledge in higher education institutions and labs that create knowledge and “push” it to the economy. Then, there are more detailed views, which concentrate on the playing field and on the “pull” aspect from entrepreneurs of these innovations.

¹³ World Bank. *Doing Business 2015: Going Beyond Efficiency*. (Washington, DC: World Bank 2015)

The investment side of the equation – Some money ventured

The sub-framework for this side of the equation sets also a playing field, but no complimentary economies, instead we see investors who have alternative portfolios and invest in startups. What differentiates this part of the economy to the other open and public markets is the lack of information, the fact that this assets are in some gray tradable, non-tradable area and that there are tons of information asymmetry and certain players with an enormous advantage (like tightly knit networks between top-venture capital firms). The development that finance and banking have achieved during the last century has set up venture capital as an actual asset class: The investment in a particular kind of company that is small and might eventually push an important innovation in to the market.

These start-up companies show an important disengagement of costs and revenues; if the start-up takes off, its revenues grow much faster than its cost base, because an original investment has been made in intangibles that later will be exploited for returns. Examples range from companies offering cloud computing to new types of pharmaceuticals, the development, or an adequately executed idea, are up-front costs, and the customers come later at low marginal costs to the company.

The literature has generally understood investors as being part of the supply part of the equation. I see them as something separate. The truth is that they are not only a pile of money, but they play a key role in the connection of the entrepreneurs with their customers.

Particularly in the developing markets, as we will see later in this work. They are also a very different agent because they have multiple investments, which lowers their expected rate of return.¹⁴ Finally, and because they have other investments, they have differing views

¹⁴ Andrew Metrick and Ayako Yasuda, *Venture Capital and the finance of innovation* (Wiley&Sons, 2011). Page 197

in commercial and investment choices from the entrepreneurs themselves, and that creates conflicts that require that we treat them as separate agents.

Two sets of authors work closely with this side of the equation, on the one side there is the already mentioned Lerner. “Boulevard of Broken dreams” sees venture capital and its deployment as the number one obstacle to the growth and development of innovation ecosystems. After several chapters of the book underscoring terrible results of loan programs to smaller companies and badly focused investment ideas in federal governments, Lerner comes to two chapters that are very telling: First he goes after “Bad designs” (loans instead of equity, investment too spread out between different agents or geographical areas), later he goes after “Bad implementations” (bad officials, etc.) As examples of good programs, he points at Yozma in Israel and other government backed venture fund schemes that eventually helped the growth of private investment. Also from this point of view and probably pushed by self-interest, the Metrick book “Venture capital and the finance of innovation” is clear in its preference for venture capitalists as the leading in the growth of these innovation ecosystems.

Another approach inside of this part of the framework talks to the optimal size and networks inside and outside of the venture capital firms. Here, the networks between venture capital firms and the small optimal size of “desks” inside of these firms are seen as key to investment. To this speaks Hochberg Et al. in “Whom You Know Matters: Venture Capital Networks and Investment Performance.”¹⁵ No radical alternatives are offered in the literature I had access to the optimal legal structure of a venture capital firm. In general, the American model is considered the golden standard or close to it, although in a good part of

¹⁵ Yael Hochberg, Alexander Liunqvist and Yang Lu, “Whom You Know Matters: Venture Capital Networks and Investment Performance.” *The Journal of Finance*, no. 62 (2007): 251–301.

the world it is hard to see complex clauses like “full ratchet” or “tag-alongs” being enforced in the daily work of funds.

The customer side of the equation – Something **really** ventured

Now we come to the demand side of the equation, the customers.

This part of the framework has been getting more attention lately, although it is the original source of attention since the middle of the last century. In “Innovation diffusion,”¹⁶ Everett Rogers creates its own framework for customer acquisition, although it does so in the larger scheme of things, where all innovation acquisition is considered into the mix. Rogers’ book stems from a study of several innovation cases and past literature, he then points to key variables that affect diffusion of innovations (acquisition of innovations by customers, or things that determine the *demand* in our framework). In the context of this paper, these are all the products of start-up companies. Concepts from Rogers’ book, which we can name customer-market fit) are the typology of adopters and how they are distributed in time.

Rogers came up with the classic bell-shape curve that summarized adoption by different sub-groups of population of almost any kind of innovation. He gave them names that we used to this day: innovators, early adopters, early majority, late majority and laggards. As the key drivers of acquisition, Rogers zeroed in to 5 characteristics of the customer or product-market fit: Relative Advantage, Visibility, Trialability, Simplicity and Compatibility. These elements, heterophily (which in the right mix allows for more diffusion) and social systems (which in the right structure, enhance or impede diffusion) build up the backbone of the Roger’s model to innovation diffusion.

¹⁶ Everett Rogers, *Diffusion of innovations* (New York: Free Press, 1995).

Later and in the context of startups and high-tech innovation comes Moore's¹⁷ "Crossing the Chasm" framework, which is an addition to Roger's model. Moore concentrates on high-tech companies, their adoption characteristics and ultimately what does this mean for fledging technological companies or products.

The main point of Moore's approach is to note the relevance of "The chasm;" the transition in adoption from Roger's early adopters to the early majority, a relevant change because, early adopters are looking for discontinuity, and the early majority is mainly conservative and is looking for incremental improvements to what already exists.

A new area of inquiry was opened after the European crisis. After plenty of wasted efforts on the supply and investment side, government agencies in Europe working in the innovation environment problem saw their budgets go down, and a new approach had to be looked for to the whole innovation ecosystem problematic.

Bureaucrats and investigators took a second look at the creation innovation ecosystem in Silicon Valley and the Tel-Aviv area and concluded that maybe government procurement (and mostly military procurement) was responsible for the kick-start of these environments; The Bay Area innovation ecosystem depended heavily on rocket science and the space program that emerged from the cold war.¹⁸ The companies in the Santa Clara valley approached the consumer and other business much later and this happened when already a good deal of companies had been created and funded (and some already folded). Tel-Aviv is similar: The companies that started (from genealogical approach) most of the Israeli telecommunications sector and later the tech ecosystem, were government owned and all worked for the military. A shift of military spending in the 1980's pushed this companies to

¹⁷ Charles Moore, *Crossing the Chasm* (New York: Harper Collins, 2014)

¹⁸ Office of Management and Budget, *Historical tables Budget of the U. S. Government* (Office of management and budget, 2011).

look for customers outside of the classical government customers, and actually found many of these customers in former comrades in arms.

Companies were pushed out of their markets and into new customer's hands because of changes in government procurement, in both cases the adopter was the government through public spending.

Because of these historical view, works by Jakon and Luke,¹⁹ Oliver and Simon,²⁰ the OECD²¹ and the European Commission Innovation Union²² press for more procurement based innovation. That is, to better point the mammoth government spending towards smaller, more innovative firms.

A last approach that seems to point to the customer but is actually all encompassing is the "Lean startup movement." Ries,²³ in his book, makes a point talking about the importance of developing with the customer, prototyping early and releasing many products, with many versions trying to zero-in to the exact customer need. This approach seems to call for a particularly strong relevance of the customer in the whole ecosystem framework, but I would posit that this is not so, because it actually supposes that customers will try out a half-baked product, which is very hard and, as we will see, particularly hard in the case of developing economies.

The framework – A small wrap-up

¹⁹ Jakon Edler and Luke Georghiou, "Public Procurement of Innovation – Resurrection of the Demand Side of Innovation" *Research Policy* no. 36 (2007): 949-963.

²⁰ Oliver Falck and Simon Widerhold, „Nachfrageorientierte Innovationspolitik“ *Studien zum Deutschen Innovationssystem* No.12 (2013).

²¹ OECD (2014), *Intelligent Demand: Policy Rationale, Design and Potential Benefit* (Paris: OECD Science, Technology and Industry Policy Papers No. 13, 2014)

²² European Innovation Union, *Innovation Union Scoreboard* (Brussels: Innovation Union Scoreboard 2015)

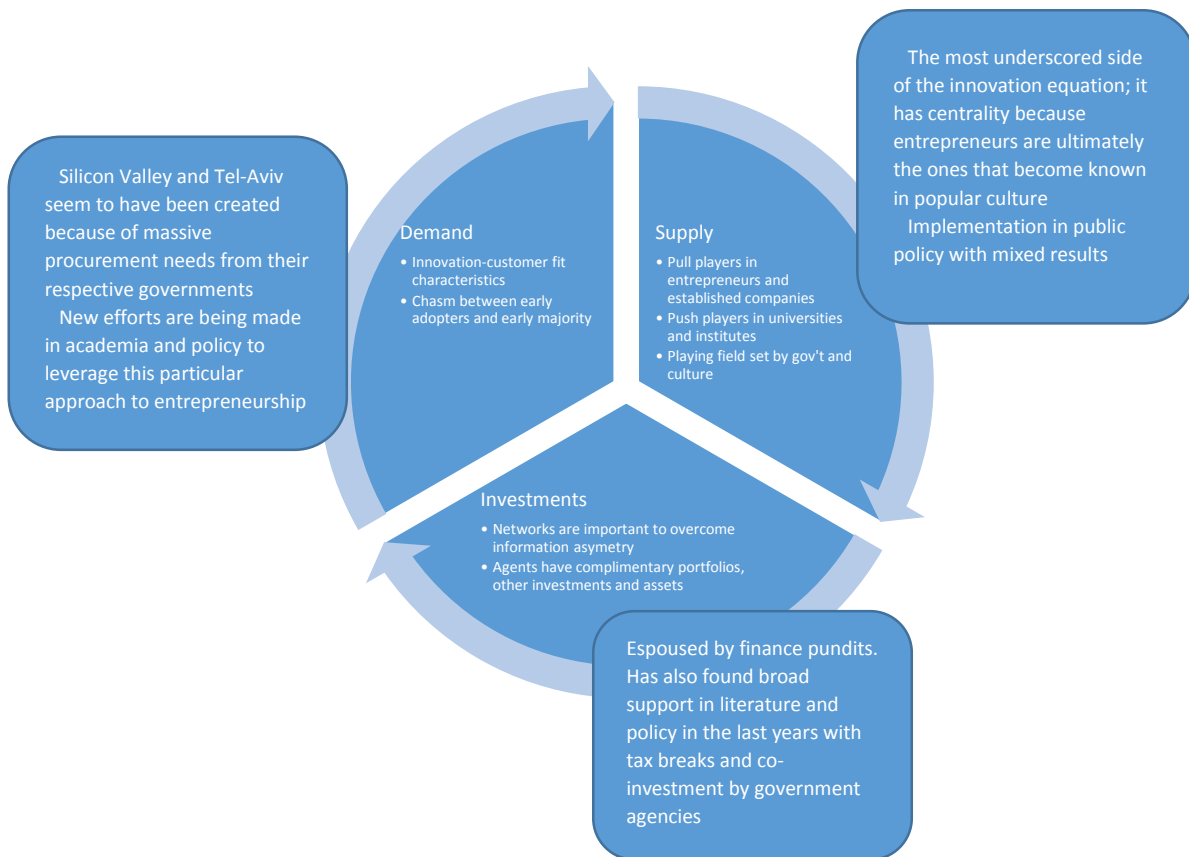
²³ Eric Ries, *The Lean Start-up* (New York: Crown Business, 2011).

In the figure, I tried to summarize what I believe to be the main points of the framework I just laid out.

First, we have a demand side for innovation from small ventures. We know of its importance because of the cases of Silicon Valley and Tel-Aviv, where government procurement played a big role in the kick starting of these ecosystems. Its main sub-framework is the Rogers-Moore framework already mentioned, where innovation properties and customer properties play a key role.

Second, we have the supply side of the equation. This is the part of the equation that has gotten most interest in recent academic work and public policy. Here we present a sub-framework with push-players in the academia and investigation, pull-players in the private sector who use these innovations and a playing field that has public players in the case of legal frameworks and private players in the case of cultural and psychological differences between countries. Here, authors like Lerner, Singer, Saul, Klapper, Christensen and institutions like the WEF and governments around the world have pushed for more and better environments for the entrepreneurs.

Finally, we have a third part to the equation, the investors. Here we present a sub-framework that shows investors as holders of a particular asset class besides a set of other assets in a portfolio, they invest in a world where specific knowledge is necessary and because of information asymmetries, networks and relationships are of extreme importance.



Source: Author's composition

In the following sections, we will concentrate on using the framework and the literature we have just reviewed to analyze the interview sets.

The interviews – or data

First set of interviews

Types of questions and reach

We built the first questionnaire trying to test for acquisition of innovation by customers.

The hypothesis that led the construction of the questionnaire was that much more research has been done on the supply and investment side of the equation, but much less about the demand side of the problem. We built a set of questions trying to find out if customer behavior had a larger impact than thought in the innovation ecosystems where these customers dwelled.

We created four sets of questions: understanding of the markets, key factors in innovation, needs and expectations of the consumer and early adoption mechanisms.

Overview of the interviewees

Most interviewees were venture capitalists. We also included entrepreneurs but we felt that venture capitalists were ideal because most of them were entrepreneurs at some point of their lives and many times also worked in larger firms. In the second set of questions, those to people in the agricultural industry in Chile, we include a set of industry specific experts, which includes the firm view in to these issues.

The questions

We started by a set of warm-up questions of the type: “Who are you?” “What is your age and educational background?” “What do you now about the industry you are working on?” etc. Then we moved on to the driver of innovation questions: “What is innovation?” “What drives innovation” etc. Then we went on two a set of questions about the needs and expectations of the customer and their adoption mechanisms, like “How did you reach your first customer?”

“What did your first customer mean to you?” “What was your relationship to your first customer?” “How did you convince him or her?” etc.

Second set of interviews

Types of questions and reach

This questionnaire was built with the specific purpose of looking at the adoption form an established and profitable industry in a developing country of technologies pushed by smaller firms. Agriculture, and in particular, export agriculture in Chile, as the one used for wine-making and Mediterranean fruits is highly competitive and has partially adopted very high-tech gadgets. Technical irrigation and certain genetically modified fruits are common part of this industry. However, it has not adopted simple management software and other advancements. This makes the area particular and prone to give us interesting answers as to why has the industry adopted some things as opposed to others.

The industry is interesting because it is very competitive. Different to what happens in the old-world agriculture, it is almost impossible to create rents because there are practically no barriers to entry, little regulation and no appellations or anything of the sort. This makes it a good example of a competitive industry and serves as an example of what would happen to other industries in the longer run.

Agriculture in Latin America is interesting as well because it is big, well developed, internationally competitive and does have a large academic backing, but does not seem to adopt has many new technologies as other agricultural industries around the world. There are millions working in agriculture in Latin America at any moment and it is indeed an world-class industry, but mired by the idiosyncrasies of developing economies. As such, we can use it to compare the developing with the developed world as far as innovation ecosystems go, and try to come up with whatever is lacking or different in the developing world.

In other words, this industry has everything a tech-hub needs to become a major innovation ecosystem: A strong supply in millions of workers and academics, a strong capital availability from governments and a profitable export sector. However, something seems to be missing. Later we will posit that this missing link is a stronger demand sector for innovation, and we will try to unveil the elements that create obstacles for this demand.

Overview of the interviewees

The interviewees were mainly part of the winemaking industry, part of the export-fruit business and we also interviewed people from the trading sector and the technology providers of the agricultural industry. We found out that the way that many innovations permeated the industry was through specific players that were more prone to adopt them, and many times were not even part of the industry itself.

Scope of the questions

I divided the interview in 7 parts. The structure heavily depended on to which part of the industry the interviewee belonged. It started pretty much like the first set of interviews, “Who are you?” and “What do you know” types of questions. Then, we moved on to drivers of success for the particular business, many times this led to a discussion of innovation and its role in the industry. Then, we moved on to the most impactful technological changes in the industry in the last 20 years and how they adopted them. A later question was “What have you not adopted that seems like a great innovation but for any reason you have not done so?” Which tended to be management software, certain irrigation practices and mechanization besides better distribution practices. I also asked about the ways in which a vineyard and other exporter supported or pushed innovations to certain smaller players. Finally, I asked about what

information would have been great to have but was not available to the industry, in order the gauge to what extent information systems had penetrated the industry.

Interview analysis - Data analysis

The customer from the view of the venture capital industry

Pagare Et al. analyzed the first set of interviews on a question-to-question basis.²⁴ Some of the conclusions were that customers were responsible of a good deal of the variability in innovations ecosystems from developing to developed countries, and that the real value of a customer to a startup varied from developed to emerging economies. In general, we can say with a level of security that methodologies like “The lean start-up” have to be taken with a grain of salt when talking about entrepreneurs and clients in emerging economies. In addition, the sets of skills that passed on according to genealogical approaches (like in “The evolution of an industry”) are probably different depending on the geography where the startup ecosystem is developing.

In the following lines, we will concentrate on a specific set of findings from the interviews that become clear after re-reading the transcripts and analyzing the structure of the venture capital industry in Latin America. We will talk about the relationships along the capital deployment structure, longer product development cycles, and self-selection patterns amongst new ventures. These “properties” of developing markets (particularly of Latin-American markets) are specific to them and we present them in opposition to what happens in developed markets. In particular, we will stress how these differences stem from strong divergence in the customer-acquisition or demand part of the equation or framework that we presented.

²⁴ Sagar Pagare, Lori Hu, Juan Abraham, Kamran Mahmood. *Impact of globalization on Customers, Financiers and Entrepreneurs in Innovation Ecosystem* (Philadelphia: Knowledge@Wharton working paper 2015)

In the next section, we will move onto the customers themselves, in the case of agriculture in Chile. First, we will try to understand why the industry has such an uneven record of technology adoption, and we will try to understand this from the point of view of customer acquisition. What is impeding the adoption of very simple, but very profitable technologies in the sector?

In general, the reasons why demand is weaker in these environments go over the purpose of this paper. We will mainly concentrate on the effects of the phenomenon. A good discussion as to why this might be can be found in Pagare Et al.²⁴

The customer and the capital-deployment structure

One of the key findings of the first study was the enormous involvement of investors and general partners in the client acquisition process in developing economies. Especially in the case of smaller, business-to-business companies, we see circumstances in which the LPs and Venture Capitalists sit on the same room as the entrepreneur and the client.

The reasons for this closer involvement are better discussed in Pagare Et al., we extend the discussion here to its impact on the venture capital structure.

This closely-knit relationship in the client acquisition cycle is repaid in kind, since the investors and GPs were so close at the time of acquiring new customers, we also see them much close, (almost) running the investment committee. This non-LP behavior (as in, they are not limited), can be deconstructed as a reaction to responsibilities that might be harder to enforce by law. This is, in some of these geographies, if for some reason a startup is involved in legal action, the plaintiffs will have a very hard time to go all the way to the investors and take their money. This means that in reality LPs are *very* protected and because of that feel free to get involved in every aspect of the process. This relegates GPs to a secondary role, but also gives

them more resources in terms of a broadened network of customers for their portfolio companies and more buy-in from the investors, who will eventually react better to further calls for capital for a particular fund.

So why do they choose to help in client acquisition and to co-run the investment committee but they do not care about other aspects of day-to-day operations? In other words, why, if you can really involve yourself in many aspects of a fund you only care about clients and choosing investments?

From the interviews we know of several instances of investor-led client acquisition (at least 6 in the 26), and of an almost pervasive presence of LPs in the investment committee (with about 10 exceptions). A good explanation for this behavior as opposed to some other is that this is where the investor can create the most value. We can adventure that participation in the investment committee would be a desirable feature in practically any geography if it were possible without many legal consequences (which is in these cases). However, the second aspect is more interesting. Client acquisition turns out to be so hard (5 interviewees mentioned that it was the hardest part of their venture and 1 actually mentioned that their first customer came the very last day of cash burn) that the most added value that investors can bring is actually getting clients for their startups. This has multiple impacts on the industry.

First, we see very involved LPs.

Second, we see less LPs per fund. We lack hard data on this fact, particularly because we cannot access the names of some of the investors, but from comments and from the GPs, we came to that conclusion.

Third, we see big, house-name family offices making a good deal of the investments. This is very interesting, and makes a lot of sense. Big potential customers will trust a brand name behind a fledging start-up, because that way they will be certain that the company will

be around longer and at least part of the trust in the household family name is transferred to that start-up.

Fourth, conglomerates have start-ups. The big holding companies that were so prevalent in the US at the beginning of the last century are still very common in developing markets. Because of several market, legal and cultural reasons, conglomerates are common in Chile,²⁵ Colombia Brazil and other economies analyzed. In at least two cases interviewed, startups decided to go directly to a conglomerate in a very early stage, pointing to the preference for not only smart venture money, but also well-connected conglomerate money.

To summarize, involved investors, household names conglomerates and family offices are more prevalent in developing economies than in developed economies because of the difficulties in the client-acquisition process.

Longer product-development cycles

One of the much-trumpeted recommendations from “The lean startup methodology” is to shorten the development cycle for products developed in startups. This follows the general idea of creating an iterative process where the needs of the customer are better served by constantly asking him or her what to do.

In a context of less trust and more uncertainty these recommendations are complicated or impossible to implement. From the interviews, we saw that at least two venture capital funds (and so, all companies in their portfolios) did not do *any* kind of development with their future customers. Another venture capitalist entirely dismissed the customer as not knowing “anything.” The abysmal difference between practitioners and literature on the subject is, in

²⁵ Majluf Nicolas, Abarca Nureya, Darío Rodríguez and Luis Arturo Fuentes “Governance and Ownership Structure in Chilean Economic Groups”. ABANTE no 1 (1998): 1

my opinion, due to difficulties in client acquisition and particularly in the tolerance of the client to work with startups.

We will look a bit at the reasons for this intolerance later in the agricultural interviews. Some of the reasons for this are less ability of the companies that buy the new technology to prosecute whoever was developing for them, also lower trust in general and lower competitive pressure. All of these result in a longer development cycle. Since the customers have a low tolerance for failed products and for on-going development, startups tend to develop in-house much longer and only later try to sell to their customers. This means that much more in-house knowledge of the industry is needed and cash burn and time-to-market is much longer. Another way that startups in these markets try to solve these problems is by giving practically free products to their first customers. In two interviews, we saw free products that only later acquired a price tag. In addition, in two cases we saw startups that took years to come to the target pricing mechanism that they aimed for at an earlier stage.

In summary, more in-house knowledge, cash burn and lower pricing power derives from less tolerance from customer for technology stemming from startups. This lower tolerance is translated into longer development cycles in developing economies.

Self-selection patterns

The two properties of developing country startup ecosystem that we just mentioned have a big impact in the type of venture that appears in these ecosystems.

In at least two interviews, venture capitalists themselves only invested in areas where they had a very specific knowledge of, and only took on startups that had a lot of knowledge of a specific subject. Their investors were also very industry specific. Most of the time startups needed less money but many more capital calls and in general ended up being so heavily co-

invested by the LPs that a majority stake ended in the investor's hands (at least one case). An alternative view for this phenomenon is that there are too few exits in these markets. However, I would like to offer an alternative interpretation: The longer development cycle and the high dependence on investors to keep a decent client-acquisition record makes it much easier for the company to just combine itself with a conglomerate or a particular family or household name in one of these economies.

This introduces a self-selection bias for industry specific ecosystems that goes beyond the talent and innovation availability in a specific geographical area. Not only must the entrepreneur come from, for example, mining. Also the LPs and GPs must also come from mining, and as a result a smaller subset of companies will be picked and funded. These companies will have simpler products, they will be very close to their own investors, and they will address a specific "Headache" in the industry (as we heard in several interviews) So, the solution will not be innovative in the sense that the industry, the investors and the GPs will *already* know of the problem. This phenomenon starkly reduces the area where innovations can be made.

Agriculture – A look at a specific industry

Why is it that we want to look at a specific industry? Well, if we just look at the innovation ecosystem in a particular country we might see the opportunities that are, but not the ones that could be. In a way, looking at the place where venture capital is not working might give us light as to why is the ecosystem as a whole not growing any faster.

Agriculture in Latin America gives us that chance. Soy and sugar production in Argentina and Brazil are among the most developed and efficient in the world by way of a mix of mechanization, gene manipulation and particularly good circumstances. Mediterranean fruits

and wine are extremely competitive in Chile and Argentina, with well-developed cold-chains, varieties and mechanization. Aquiculture is another excellent example; Chile is the second largest salmon exporter in the world, with a very developed and competitive industry that competes against Norwegian, British and Canadian counterparts.

We will go over the same points laid out in the last section: Investor involvement, development cycle and self-selection, but from the point of view of the customer in one specific industry.

The customer and the capital-deployment structure

In our interviews, most of the interviewees (~30%) identified export companies and traders as the main drivers of innovation in the agricultural world in Chile. Only in second place came companies themselves, and the main reason cited was increased international competition (All cases of international vineyards). Only in one occasion, the main innovation brought to a company in agriculture in Chile came from a smaller startup and it was a particular software in the distribution side of these companies.

It is of particular interest that almost all innovations, new software, new irrigation methods and new machinery were either pushed by vendors which already had a different relationship with the companies (the export and trader companies), came from a company with a strong relationship (a particular consultant who was a former vineyard executive) or came from the companies themselves.

Not a single innovation, in all the questions made came from a company not intimately related to the incumbents and only one was actually a small company. The most disentangled example that we could find was that of an export company that regularly flew to Israel to buy new irrigation machinery, even though the same was available in Chile.

What is very interesting in all of this is that one of the most successful Venture Funds in Chile, Sembrador, works precisely in agriculture, but they do not work in specific technology, but in new agricultural ventures that they set-up, and then sell to other companies. Again, we see the impact of a lacking demand for innovation skewing results. To a good extent, we can argue that there is no venture capital industry in Chilean agriculture, with the exception of Sembrador. Even in the successful case of Sembrador, half the company belongs to Sub-Sole, a Chilean exporter, which is leveraging its traditionally advantageous position to improve its returns.

If we look at the patterns in the answers, it is clear that competition and availability of innovations themselves are not responsible for the lack of a venture industry (supply). In addition, considering the high levels of investment that an export-grade fruit crop requires, we cannot posit that it is a lack of investment what is affecting the industry (investment). Since innovation has taken place, but always comes from very close to home places, we can only conclude that this is a demand side problem.

Therefore, we can only conclude that a more natural way for a venture capital industry to develop in this environment would be that of having the export companies or the providers or agriculture develop venture capital arms themselves, and push innovation to their own clients through these startups. Since no innovation has been adopted without extremely close relationships, it is hard that this will happen in any other way.

This finding is closely related to the venture capital structure in the last section. Startups, VCs and LPs in these developing economies are entangled and less diversified because of the difficulties of convincing companies to adopt innovations. Hence, the first step would go through pushing the incumbent sources of innovation (traders, exporters and providers) towards a smaller scale, more startup-based innovation, instead of looking to create blind intermediaries like VC funds.

Longer product-development cycles

Since agriculture, and particularly fruit agriculture has very long cycles, it is to expect that any sort of innovation will have a very long cycle of development anyways.

We can attest to the intolerance of companies to work with an innovation that is actually under development. This, by looking at the experience of one of the interviewees who worked at a provider of agriculture in Chile. In his interview, he confided that he had imported a set of machinery and developed a new way of growth for a particular crop. The coming of new technology was not well received by the Chilean incumbent clients. The interviewee later started working at a processing plant, that actually pushed the technology to its own providers (producers), using the machinery of the provider the interviewee used to work for.

In summary, because there was not a close relationship between the provider and the potential clients, the adoption did not take place, only when the processing plant asked for the adoption of the technology the provider had the chance to deploy the technology. During this entire time was the smaller technology provider in “development” of the idea, but it was ultimately the exporter who pushed it.

Another example can be made of the three purely export companies that we interviewed. None of them were able to sell a technology without implementing and developing it first themselves. This meant not only that they had to have their own crops to show the development, but also that they had to finance the adoption by others and that they were partially responsible if they did not work. Ultimately, in the case of genetically modified fruits, they had to be extremely careful of who they gave the new strain to, because they might give it away to others who might steal it. In particular, in the case of blueberries and grapes this meant that development cycles were incredibly long, leading to “product cycles” that lasted almost a decade.

Self-selection patterns

Because of all of the above self-selection of small innovative companies in agriculture in Chile is extreme. There are practically no startups, and all we can see is either smaller crops heavily and closely monitored by incumbents (like the case of the Sembrador portfolio companies) or import and adaption of technologies from other larger companies. Innovators are incumbents and it all seems to stem from a trust or legal issue.

Conclusions

Customers are key. Demand is key. Just like in any other industry, there is no economic growth, no competition, now productivity increases if demand stays low and depressed. The demand for innovation is not trivial. We saw that innovation, at least in these environments, heavily depends on incumbents. The fledging venture capital industry is actually nothing but a protrusion of the incumbent companies; this is due to their advantageous relationship to the potential customers.

In most public policy papers a model of venture capital firm is put forth where investors are legally separated from the investment. This has many legal advantages and solves many principal-agent problems, but creates a distance between those who have the clients and those who have the technology.

Maybe a better way of creating an innovation ecosystem starts by pushing the existing, incumbent-centered ecosystem, slowly towards one where the incumbents can share their client relationships and explicitly can escape unscathed if something goes amiss. A possibility would be to create industry sponsored venture capital funds, where the state or a set of investors co-invest with an incumbent, which has a limited, but large, liability in a particular venture. In

Chile the industry does this already in a way, with funds working in the aquiculture industry unofficially sponsored by a big industry incumbent, and agricultural funds explicitly sponsored by an export company. The idea would be to create legal frameworks that exploit this industry specific development and try to broaden it to other industries.

Another interesting conclusion is very much in line with the conclusions from Pagare et al.: The fact that bankruptcy laws are complicated and in general quite traumatizing for the entrepreneur is actually preferred by the customers. They can be assured that the entrepreneur will try its best. Special care must then be put in the creation of more expedited bankruptcy laws in these countries, or else the little demand for innovation out there will disappear.

Bibliography

- Christensen Clayton. *The innovators dilemma*. Boston: Harvard business Press, 1997
- Drori Israel. *The Evolution of a New Industry: A Genealogical Approach. (Innovation and Technology in the World.)* Stanford: Stanford University Press, 2013.
- Edler Jakon and Georghiou Luke. “Public Procurement of Innovation – Resurrection of the Demand Side of Innovation”. Manchester: *Research Policy* no. 36, (2007): 949-963.
- European Innovation Union. “Innovation Union Scoreboard”. *Innovation Union Scoreboard* (2015)
- Ewig Marion Foundation. *The Importance of Startups in Job Creation and Job Destruction*. New York: New Firm Formation and Economic Growth Series, 2010
- Falck Oliver and Widerhold Simon. “Nachfrageorientierte Innovationspolitik.“ *Studien zum Deutschen inovationsssystem* No. 12 (2013).
- Guillen Mauro, Kappler Leora and Amit Rafael. ” Entrepreneurship and Firm Formation across Countries ” *International Differences in Entrepreneurship* (2010) 129 - 159.
- Hochberg, Yael., Ljuqvist, Alexander and Lu, Yang. Whom You Know Matters: Venture Capital Networks and Investment Performance. *The Journal of Finance* no. 62 (2007): 251–301
- Jackson Deborah, *What is an Innovation Ecosystem* (Arlington: National Science Foundation, 2008).
- Lerner Josh. *Boulevard of Broken dreams* Princeton: Princeton University Press, 2009)
- Boohm Melisa. *Far from Silicon Valley*. Philadelphia: Lauder Global Knowledge Lab, 2014.
- Majluf Nicolas, Abarca Nureya, Darío Rodriguez and Luis Arturo Fuentes “Governance and Ownership Structure in Chilean Economic Groups”. *ABANTE* no 1 (1998): 1
- Metrick, Andrew and Yasuda Ayako, *Venture Capital and the finance of innovation* (Wiley&Sons , 2011). Page 197
- Moore Charles, *Crossing the Chasm*. New York: Harper Collins, 2014
- OECD (2014), *Intelligent Demand: Policy Rationale, Design and Potential Benefit*. Paris: OECD Science, Technology and Industry Policy Papers No. 13, 2014

- Office of Management and Budget, *Historical tables Budget of the U. S. Government*. Washington DC: Office of management and budget, 2011
- Pagare Sagarendra, Hu Lori, Abraham Juan, Mahmood Kamran. *Impact of Globalization on Customers, Financiers and entrepreneurs in innovation ecosystem* (Philadelphia: Knowledge@Wharton working paper 2015)
- Malach-Pines, A., Levy, H., Utasi, A., & Hill, T. L. "Entrepreneurs as Cultural Heroes" *Journal of Managerial Psychology* Vol. 20 No. 6 (2006): 541 – 555
- Ries Eric. *The Lean Start-up*. New York: Crown Business, 2011
- Rogers Everett. *Diffusion of innovations*. New York: Free Press, 1995
- Senor Dan and Singer Saul. *Start-up Nation*. New York: Grand Central Publishing, 2009
- Steve Sheer. "Israel to expand tax breaks to boost investment in start-ups", last modified July 16th, 2014. <http://www.reuters.com/article/2014/07/16/israel-taxbreaks-tech-idUSL6N0PR3DI20140716>
- WEF. *The Global competitiveness Report WEF2014*, 2014.
- World Bank. *Doing Business 2015: Going Beyond Efficiency*. Washington, DC: World Bank 2015.