PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE

EPIC LAB

EVIDENCE-BASED POLICY & INNOVATION RESEARCH LAB

ACCELERATORS

ESCUELA DE INGENIERÍA
FACULTAD DE INGENIERÍA

Project supported by
CORFO

Gobierno de Chile

The following content is confidential. Please do not distribute or share this document with anyone.

Michael Leatherbee, Ph.D., and Juanita Gonzalez-Uribe, Ph.D wrote both chapters as a part of a book about accelerators edited by Mike Wright, Imperial College Business School and Israel Drori, VU, Amsterdam. This book is about to be published within 2017.

About EPIC Lab

Research laboratory based in the School of Engineering of Pontificia Universidad Católica de Chile. Its main goal is to generate timely and robust information to improve the design and effectiveness of entrepreneurship and innovation policies, throughout the identification of cause and effect of entrepreneurship and innovation programs in order to generate evidence-based knowledge that helps to socio-economic development.

EPIC Lab has received support from national and international institutions including the Chilean Economic Development Agency (CORFO), the Innovation Growth Lab (UK), and Aubrey Chernick Foundation (EE.UU.).

For more information, please visit: **www.epiclab.uc.cl**

Author Bios

Michael Leatherbee

Michael Leatherbee is an assistant professor at the Industrial and Systems Engineering Department at Pontificia Universidad Católica de Chile. He is the Academic Director of the Evidence-based Policy and Innovation Research Lab, board member of Start-Up Chile and IncubaUC business accelerators, and member of the Chile-California Council. His research focuses on strategy, entrepreneurship and policies. He has won multiple national innovation awards and has been awarded several research grants such as the Innovation Growth Lab (2016) and the Stanford Institute for Innovation in Developing Economies (2014). Michael has a Ph.D. in Strategy, Organizations, Entrepreneurship and Technology from Stanford University.

Juanita Gonzalez-Uribe

Juanita Gonzalez-Uribe is an assistant professor at the London School of Economics (LSE). Her research focuses on entrepreneurship, private equity and innovation. Her work on the interaction between Venture Capital and Innovation has won several prizes including the Kauffman Dissertation Award (2012) and the Coller Prize Award London (2013). She has also won several grants for her research projects including Coller Institute Grant (Israel, 2014) and NBER Innovation Policy Grant (2014). Juanita has a Ph.D. in Finance and Economics from Columbia University, and, a Master in Economics and a Bachelor in Economics and Mathematics from Universidad de los Andes (Colombia). Prior to her PhD studies, Juanita worked as a junior researcher at the Central Bank of Colombia.

Selection Issues

Michael Leatherbee and Juanita Gonzalez-Uribe

ABSTRACT

By construction, accelerators select startups from among a broader group of applicants. The assumption is that through the selection process, accelerators are able to discriminate between high- and low-potential startups. Thus, the expectation is that accelerators are an effective medium for capturing the upside potential of the select few startups that promise to deliver the highest value in the future. That upside potential may be materialized through equity investments in the participant startups or increased socioeconomic development, depending on the mission of the accelerator. Typically, the selection process relies on a set of objective criteria predetermined by the accelerator, which are applied by one or more entrepreneurship experts who act as judges or evaluators of the applicant pool. First, we describe the different selection stages and methods typically managed by business accelerators. Next, we expose the multiple important issues that must be taken into account when designing and managing selection processes. Understanding these issues may help clarify the challenges and limitations of current selection methods, and to avoid potential pitfalls and unintended consequences.

Because the performance (and sustainability) of accelerators depends heavily on the ability to attract and choose the best startups, selecting startups is a key aspect for the survival of business accelerators. As discussed in the key performance indicators chapter in this book (Chapter 7), accelerators strive to attract, select, and (sometimes) invest in the highest-potential startups. Doing so effectively provides accelerators with valuable pecuniary and non-pecuniary resources. For example, having an equity stake in a profitable startup (or one that gets acquired or goes public) certainly helps fill the accelerator's coffers, which is useful to sustain the operation and keep accelerator sponsors happy. Selecting high-potential startups also increases the chances of having high-profile startup alumni. This aspect is valuable because it provides accelerators with legitimacy, which in turn helps attract other high-potential applicants. Business schools know about this virtuous cycle all too well. Being able to attach an institution's name to a high-profile alumnus certainly helps increase the institution's media exposure, and the subsequent desire of new applicants to be part of that institution. According to the authorities of some of the world's leading universities, the quality of an institution's alumni is, to a large degree, a result of the quality of an institution's pool of applicants. Thus, choosing the best applicants can be an effective way to improve an institution's alumni pool.

Having capable and successful alumni can also be useful for developing other non-pecuniary resources, such as a mentor support platform for accelerator participants and graduates. Much

like the top business schools have sophisticated alumni network platforms, managing an alumni network of successful entrepreneurs can help incoming accelerator entrepreneurs tap into the social resources implicit in the accelerator's alumni network (e.g., advice, ideas, and contacts with potential investors, partners, customers, and employees). Thus, selecting the right startups (and entrepreneurs) is key for accelerators because it could provide them with cash (from investment in successful startups), media coverage, and a valuable social network.

1. Selection stages

Business accelerators typically manage three key selection stages: application, special services, and cohort champions. The application stage entails the revision of startup applicants who wish to become accepted into the accelerator. Depending on the number of applicants, the selection process can take different forms (as discussed further below). For example, Y Combinator, Techstars, and Start-Up Chile receive approximately 1,000 applicants each application cycle, and have an acceptance rate of roughly 5% to 10%. Thus, a poor application selection process has a very high chance of leaving some of the highest-potential applicants in the rejection pool, which can have significant consequences for the performance and sustainability of accelerators.

The special-services stage corresponds to a selection process that occurs at some point during participants' tenure in the program, typically before the halfway point. The purpose of this stage is to select participants that may benefit the most from the special services provided.[1] This stage can take the form of a competition between accelerator participants, among which the winners receive additional benefits unavailable to all participants. For example, Start-Up Chile runs a voluntary "pitch-day" competition two months into the six-month program. Most participants opt-in to compete, because winners receive attractive perks such as a visit to Silicon Valley, media coverage, or access to high-profile mentors.[2] Because these special services are limited to only a few, the selection process plays the key role of identifying those startups that will benefit the most from the additional resources. Thus, again, a poor selection process could waste an opportunity to improve the performance of those startups that would benefit the most from the special services.

---

1. For an example of the effects of entrepreneurship schooling as a special service, see Gonzalez-Uribe and Leatherbee (2017).
2. Accelerators are constantly experimenting with different processes and methods, thus changing their programs and benefits.

The cohort-champions stage entails the attempt to select the best (highest-potential) startups of a given cohort at the end of the program. This selection process typically involves a pitching competition, whereby competing startups make a short (e.g., five-minute) investor-focused presentation of their venture. The audience may vary from a select group of privately invited competition judges to an open admission of members in the community. The former is common in investor-led accelerators who aim to capture the potential upside of the new ventures, whereas the latter is consistent with the philosophy of ecosystem accelerators who aim to spur entrepreneurial activity in the community.[3] At this stage, being effective at selecting the highest-potential entrepreneurs from the rest is not very critical for ecosystem accelerators, because the competition is mostly symbolic. That is, ecosystem accelerators do not typically take an equity stake (e.g., stock ownership) in the business. Rather, ecosystem accelerators indirectly benefit from the success of their alumni pool more broadly. However, selecting the right startups at the cohort-champions stage can be critical for (investor-led) accelerators that base their investment decisions on the outcome of this competition. Therefore, if the selection process is not effective, it will have direct consequences on the cash-generating capabilities of the accelerator and, consequently, on its sustainability.

2. Selection methods

The selection method can differ at the different stages depending on the number of applicants to be evaluated and the programmatic design of the accelerator. If large numbers of applicants must be evaluated in a short time period (as is common with the most popular programs), business accelerators tend to outsource their application process to external companies—such as YouNoodle in the case of Start-Up Chile. These companies typically manage an internet-based platform that receives submissions from applicants on one side, and on the other side provides access to judges who review the applications. Thus, once the request for applications is closed, these companies assign the applications to a corps of judges committed to review them, who in turn score the assigned applications. In the case of YouNoodle, three independent judges review each application, and each judge reviews roughly 10 applications. At the end of the assessment process, scores are averaged and applications are ranked according to the averaged score. The results and applications are then provided to the business accelerator.

---

3. For a more detailed explanation of the different types of business accelerators, see Clarysse, Wright, and Van Hove (2015). To better understand the effects of having more open-access competitions, see Fehder and Hochberg (2014).

Volunteers, who are deemed to have some expertise in entrepreneurship, typically compose the pool of judges. Thus, the pool includes entrepreneurs, investors, academics, and industry experts. Frequently, business accelerators rely heavily on their alumni to act as judges. This reliance could potentially lead to another virtuous (or vicious) cycle. Assuming the application-stage selection process is able to pick skilled entrepreneurs who end up becoming accelerator alumni judges, a positively reinforcing virtuous cycle would be created. That is, skilled applicants become skilled alumni who in turn become skilled judges who are able to identify skilled applicants. However, business accelerators also are at risk of falling into a vicious cycle where the opposite is true. Thus, the selection process can be a critical aspect in the sustainability and success of accelerators.

Usually, once the external application-process company provides the results to the business accelerator staff, a second-stage evaluation process is activated. This second stage consists of having a panel of internal evaluators review the top-ranked applications for a final decision. Thus, if the cohort capacity were 100 startups, this panel of internal evaluators may limit their analysis to the top 200 ranking applications resulting from the external application process (from a total of, say, 1,000). In this case, internal evaluators can decide whether they wish to divide their limited time into reviewing all 200 cases superficially, or reviewing, for example, applications ranking 50 through 150 more thoroughly. This latter decision relies on the assumption that the external application process is able to effectively identify the top 50 applicants, which would not require a second assessment by internal evaluators. We will come back to this assumption later in the chapter.

Once the final selection decision is made at the application stage and the new cohort gets installed into the accelerator, some accelerators move on to the special-services selection stage. In this stage, because the volume of applicants can be significantly smaller than at the application stage, the selection method can differ. For example, the selection can take the form of a pitching competition (which may take more than a day to conduct), whereby contestants (typically fewer than 100) have a limited time (five minutes) to present (or "pitch") their business ideas to a panel of expert judges. This panel can consist of accelerator staff and entrepreneurship experts from the community in which the accelerator is located. The judging criteria are ad hoc to the special services provided by the accelerator, and scores are typically pooled among judges. The top-scoring contestants are then awarded a slot in the special-services program.

An important issue at this selection stage is the alignment of the selection criteria with the rate of contribution of the special services to the awarded startups. That is, the ideal scenario would be that the startups selected to receive the special services are, in fact, the startups that would

benefit the most from the special services—in accordance with the goals of the accelerator. For example, if the goals of the accelerator were to identify the best startups in which to invest (as is the case for investor-led accelerators), the selection criteria should be based on the candidate's potential to provide a high return on investment for new investors. If, on the contrary, the goals were to help those startups that need the most help (as might be the case of some ecosystem-accelerators), then the selection criteria should be aligned with this goal. In other words, judges should not score pitch competitors based on the potential rate of return for stockholders (as typically done), but rather on how much the startup could improve if it received the special services. In this case, the "best" contestants from the perspective of a potential investor may actually not win the competition, because these contestants may well be successful regardless of the services.

In this latter case—where the awarded startups are not necessarily the most attractive from the perspective of a potential investor, but rather those that could benefit the most from the special services—the accelerator may have to deal with potential "gaming." For example, contestants may feign weaknesses in order to convince judges about the startup's (fictitious) needs for the special services, thus increasing their chances of winning the competition. Of course, conventional business-plan competitions are also not absent feigning. Contestants may feign strengths in order to convince judges of the startup's (fictitious) potential to provide future investors with attractive returns. However, in this latter case, over time, judges may have become more sensitized to this potential feigning, as opposed to the feigning of weaknesses.

The final selection stage that characterizes business accelerators is the cohort-champions stage. The goal of this stage is to select the most promising startups of the cohort. To do so, accelerators organize a business-plan pitching competition, commonly dubbed the "demo-day." This competition may be completely open to the community in which the accelerator is immersed, or it may be a private event closed to all but the competition's judges. The former is more common in ecosystem accelerators, which aim at increasing public spillovers within the community. The latter, by contrast, is typical of investor-led accelerators, which prefer to have more exclusive information that will provide an advantage when investing in promising startups.

The judges of this stage are typically high-profile investors or entrepreneurship experts from the community, who score contestants' pitches according to a rubric predefined by the accelerator. Contestants typically have limited time (e.g., 10 minutes) to explain the achievements and business potential of their startups, and may have the opportunity to fend off questions from the judges. One after the other, contestants go on stage to pitch their startup and are scored by

the judges. After the end of the competition, judges average the individual scores assigned to each contestant and (may) deliberate about the potential winners. Lastly, the judges inform the contestants of the final selection.

One of the challenges of trying to identify the highest-potential startups in a given cohort using external judges is the limited information these judges have to make an informed decision. Regardless of how skillful these judges may be at discriminating between high- and low-potential startups, these judges rarely make their own personal investment decisions based on a short business plan presentation. They may use the presentation as a steppingstone to make a decision about initiating a due diligence of the startup, but are unlikely to make an investment decision without the due diligence. The due diligence is the process that provides potential investors with enough information to commit to an investment (or non-investment) decision. Deals commonly fall through during the due-diligence phase, which suggests a pitch competition does not provide enough information to make a serious decision about a startup's potential.

Some accelerators, such as Village Capital, have developed a strategy to address the challenge of assessing startup potential with the limited information provided by the business-plan pitching competition. Instead of relying on external judges that are not able to spend much time on assessing each contestant, Village Capital relies on the startups' peers. That is, the accelerator's cohort members collectively identify (e.g., through a voting system) the highest-potential startups. This approach relies on the principle that peers—who have spent several months working in close proximity to each other—have more accurate information about the potential of the startup as a whole than judges who have a few minutes to observe a pitch presentation. That is, peers are able to observe not only the logical potential of the idea (i.e., the business model), but also the behaviors of the founding team throughout the length of the program. A similar phenomenon occurs in business schools. Classmates typically know much more about a given student than a single professor does.

Although whether an investment strategy that relies on the wisdom of the crowd (the cohort participants) is more effective than relying on a panel of external judges is still in question, it is certainly an interesting idea to follow closely. For example, Village Capital's strategy for sustainability relies on investing in the cohort champions identified through a peer selection process. An interesting experiment would compare the post-accelerator-participation performance of winners of a business-plan pitching competition selected by external judges, against the performance of winners based on peer selection.

In some cases, accelerators take advantage of the selection processes to provide contestants with feedback based on the opinions of judges. The principle behind this idea is that potential value is created as a consequence of the evaluation by third parties, which could be used to improve entrepreneurial performance. That is, the impressions of external parties could potentially improve the performance of contesting startups, and making the extra effort to provide contestants with evaluators' feedback can provide an opportunity to benefit those startups. For example, Valid Eval developed a startup evaluation software that helps judges register their assessment of each contestant, and facilitates the process of providing feedback. In essence, this tool reduces the cost of providing and managing the feedback.

Is going through the effort of providing feedback actually useful? Recent scientific research has aimed at answering this question. For example, Wagner (2016) conducted a randomized control trial using Start-Up Chile applicants with the support of YouNoodle. The treatment group received feedback from judges about their applications, whereas the control group received none. By looking at the startups' performance a few years later, Wagner found that those who received the feedback were doing significantly better than those who did not. Thus, going the extra mile to provide feedback appears to be useful for entrepreneurs, although not necessarily for accelerators. Whereas the goals of ecosystem accelerators are aligned with the way spillovers may benefit the community (but not directly benefit the accelerator), investor-led accelerators are more focused on making sure they achieve a high return on investment. For the latter, any expense that creates value that is not captured by the accelerator is considered a source of inefficiency that must be corrected.

Another example of the effects of feedback on startup performance is a study conducted by Howell (2016). She found that informing rejected applicants about how poorly they fared relative to their peers increases the likelihood of abandoning the startup by 12%. This finding suggests that, if the aim is to induce entrepreneurs to persist with their startups, providing a rejection letter without informing the relative judging scores is probably better.

However, whether providing this negative feedback to entrepreneurs is actually detrimental for them in the end is unclear. Entrepreneurs may, when facing the harsh reality of pursuing a low-

---

4. *For a better understanding of the opportunity discovery refinement process entrepreneurs undergo as a consequence of market feedback, see Leatherbee and Katila (2016). Available at SSRN: https://ssrn.com/abstract=2902869.*
5. *EPIC Lab white paper available at http://epiclab.uc.cl/wp-content/uploads/2016/11/False-positive-negative-white-paper-2-EPIC-Lab-EN.pdf.*

potential opportunity, abandon their startups only to start searching for better opportunities. In this case, providing (realistically) negative feedback may encourage entrepreneurs to explore (and subsequently capture) better opportunities they would not have considered had they not received the feedback.[4] As a white paper by the Evidence-based Policy and Innovation Research Lab suggests,[5] entrepreneurs can be quite resilient in their search for better opportunities, especially when leveraging useful feedback about their startups.

3. Selection issues

Because the selection process can have such a significant impact on an accelerator's outcome, designing effective selection methods is key for performance and sustainability. Nevertheless, this exercise is non-trivial. It is fundamental to understanding the potential pitfalls, limitations, challenges, and unintended consequences of the different selection approaches, lest one were indifferent to setting the accelerator on a trajectory that would lead to a substandard (and potentially terminal) outcome.

For example, take the case of the selection process in an investor-led accelerator. If the process were not able to pick out the best applicants, such an accelerator would not capture all of the potential value implicit in the applicant pool. Leaving untapped value in the ecosystem opens the possibility for a competing accelerator to capture such value, thus eroding the competitive advantage of the focal accelerator. In other words, the long-term sustainability of investor-led accelerators relies heavily on the ability to ride the curve of maximum potential performance. One important activity in riding this curve is the capture of the best possible startups within a given applicant pool. Of course, as discussed previously, an alternative (indirect) approach to improving the output of the selection process would be to improve the average quality of the applicant pool. Thus, despite an ineffective selection process, an accelerator's cohort quality may increase (and the accelerator's subsequent performance) simply because the average quality of the applicant pool increased. In other words, a random selection of items from a given pool can produce better results simply by improving the quality of the items in that pool.

4. When "best" is not "right"

In the case of ecosystem accelerators, because their goals are more oriented toward building a vibrant entrepreneurial ecosystem, the criteria of what constitutes the "right" applicant are likely to differ from investor-led accelerators. For example, if an ecosystem accelerator's goal

were to have the largest possible effect on an entrepreneur's performance trajectory, selecting anyone but those applicants who would benefit the most from the accelerator experience would be an inefficient use of resources. That is, selecting an applicant who would perform just as well without the acceleration experience, at the cost of selecting an applicant who would benefit significantly from the experience, would be a wasted opportunity to have a positive effect on the latter.

This tension between selecting the highest-potential applicant and the applicant most in need of support may seem evident in hindsight, but rarely do accelerators keep this in mind when designing their selection processes. Some entrepreneurs who get accepted into the accelerator might not improve as a consequence, and would have done just as well in the absence of the accelerator experience. That is, the highest-potential startups (those that would provide the best profitability to investor-led accelerators) might not also be those that benefit the most from the accelerator experience treatment. If we assume accelerators provide certain services that help a certain type of startup more than others (e.g., perhaps those startups that are weak in social capital), and if we assume startups high in social capital are ex-ante the highest in potential, it would behoove investor-led accelerators to select the startup high in social capital (to ensure the highest potential for performance), whereas it would behoove the ecosystem accelerator to select the startup that could improve the most in social capital as a consequence of having the accelerator treatment.

For example, Table 1 illustrates how accelerators (specifically the entrepreneurship schooling component of accelerators) can have heterogeneous treatment effects on different types of entrepreneurs. The entrepreneurship school provided by the Start-Up Chile ecosystem accelerator is much like a business school, but for entrepreneurs. It is a competitive program that provides participants with certification (from being accepted into a prestigious program), education (through workshops), mentorship, access to valuable social networks, exposure to the market and potential investors, accountability structures for making progress to key milestones, and a boost in entrepreneurial self-efficacy.[6] From a sample of Start-Up Chile participants, entrepreneurship schooling appears to have a particularly strong effect on the amount of capital raised for Chilean (domestic) and South American (regional) entrepreneurs. In terms of market traction, the effect is particularly strong for regional and foreign (non-South American)

---

6. For more information about the effects of entrepreneurship schooling no new venture performance, see Gonzalez-Uribe and Leatherbee (2017).

entrepreneurs. Thus, in designing and managing business accelerator programs, we must keep in mind that not everyone will respond in the same way to participating in an accelerator.

TABLE 1: HETEROGENEOUS EFFECTS OF ENTREPRENEURSHIP SCHOOLING ON THE AMOUNT OF CAPITAL RAISED AND MARKET TRACTION.

	Capital Raised				Market Traction			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Domestic	Foreign	Regional	Non regional	Domestic	Foreign	Regional	Non regional
Entrepreneurship Schooling	7.601*	2.540	5.673*	1.523	0.827	0.175*	0.600**	0.054
	(3.941)	(1.597)	(3.060)	(1.608)	(0.679)	(0.093)	(0.299)	(0.056)
Constant	0.785	0.850	0.825	1.010*	0.019	0.012	0.011	0.031
	(0.916)	(0.560)	(0.772)	(0.597)	(0.070)	(0.029)	(0.055)	(0.019)
Observations	58	218	108	168	58	218	108	168
R-squared	0.251	0.150	0.077	0.217		0.342	0.008	0.341
t-stat differences		1.65		1.60		1.19		2.23

This table compares the effect of entrepreneurship schooling among Start-Up Chile participants of different regional origins. Domestic (Regional) refers to Start-Up Chile participants originating in Chile (South America). Foreign refers to Start-Up Chile participants originating outside of South America. The sample includes all applicants to the entrepreneurship school in Start-Up Chile during the 4th until the 7th generation of the program (from 2012 to 2014). All regressions include generation fixed effects, control for fund raising prior to participation in the program. Capital raised corresponds to the natural logarithm of funds raised within four years of participation in Start-Up Chile (source: CB Insights). Market Traction corresponds to the logarithm of the number of Facebook likes in the participant startup's webpage, within 4 years of participation in Start-Up Chile. T-statistics of the differences in effects across different regions are presented in the last row. The t-statistics in columns 2, 4, 6 and 8, compares the coefficients in columns 1 and 2, 3 and 4, 5 and 6, and 7 and 8, respectively. Standard errors are robust and presented in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The effect of entrepreneurship schooling is estimated using a regressions discontinuity approach that exploits discontinuities in the selection rule to the entrepreneurship school of the program. For more details, see Gonzalez-Uribe and Leatherbee (2017).

5. (In)ability of expert judges

The most common approach for evaluating applicants is to rely on expert judges. These individuals typically review an application and provide a qualification score that is used as an input for the selection decision. These evaluation approaches rely on the assumption that expert judgment is the most effective tool to gauge future performance. However, some evaluation strategies appear to be relying too heavily on this assumption. Although reliance on expert judges does seem to be effective in some cases, it certainly has limitations that warrant a greater level of skepticism.

For example, Gonzalez-Uribe and Leatherbee (2017) found that selection processes that rely on expert judges do appear to discriminate between low- and high-potential-performance startups. However, the effectiveness of this discrimination is limited. From a sample of over 3,000 startups applying to Start-Up Chile, applicants judged to be among the top 10% (roughly, those accepted into the accelerator) were, on average, only about 6% more likely to raise capital within the four years following the assessment than those judged to be among the lower 90%. This difference is not very big. In fact, for an average cohort of 1,000 applicants, about 8 accepted applicants reported raising capital, and 13 rejected applicants reported raising capital. In other words, for every cohort, the selection process was able to select only 8 out of the 21 applicants that had the potential to raise capital within 4 years after the application (i.e., a success rate of 38%). This comparison is even starker if we were to assume that the 8 selected applicants might have improved their likelihood of raising capital as a consequence of being accepted in to the accelerator.

We recognize this analysis is naïve and does not accurately reflect the ability (or inability) of selection processes based on expert judges. The purpose of our example is to illustrate that selection processes typically used by accelerators are far less effective than probably assumed. That is, although large-scale judging processes appear able to produce a pool of selected applicants that is on average slightly better than the pool of rejected applicants, such processes are far from perfect.

Supporting the notion that the judging process of discriminating between high- and low-potential applicants has important limitations, we conducted an analysis of the Start-Up Chile judging process. Table 2 shows the predictive capability of the pooled judges' scores (Applications Scores) and investment potential (Investment Recommendation) on the latter performance of the judged startups for all accelerator participants (i.e., conditional on being ranked among the

high-potential-performance applicants). Performance measures include whether the teams are selected to compete in the demo day, the amount of private capital raised, cumulative sales, previous years' sales, valuation, and number of employees. The application scores are effective at predicting whether participants were selected during the pitch competition to participate in the demo day (column 1). That is, startups that received high scores at the application stage also received high scores at the special-services stage, despite the fact that judges and the judging criteria in both stages are different. Surprisingly, however, the judging scores are not predictive of other, more objective measures of startup performance (columns 2-5).

Why are application-stage scores correlated with special-services-stage scores but not with other more objective measures of performance? One plausible explanation is that some entrepreneurs have a special knack for convincing judges they are a high-potential startup, and that—above a certain threshold—this unique skill is not strongly correlated with actual startup performance. In this case, business accelerators should try to figure out ways to distinguish the ability to persuade potential investors from the ability to build profitable ventures.

TABLE 2: CAPACITY OF JUDGING PROCESS TO PREDICT LATTER ENTREPRENEURIAL PERFORMANCE.

VARIABLES	Demo Day	Private Capital	Cumulative Sales	Sales Last Year	Valuation	Employees
Application Score	0.531***	244,327	124,277	-867.6	3.045e+06	0.757
	(0.000)	(0.136)	(0.213)	(0.987)	(0.161)	(0.588)
Investment Recommendation	0.288***	-31,984	51,880	25,637	-292,881	0.154
	(0.004)	(0.367)	(0.327)	(0.449)	(0.433)	(0.799)
Observations	1,114	527	514	508	227	578

This table shows the relation between pooled judging scores (Application Score is the result of the application criteria, and Investment Recommendation is the self-reported likelihood of judges to recommend the startup to an investor) and different performance measures. Demo Day is a binary variable that represents whether the startup was selected during the special-services selection stage (the pitch-day competition) to be part of Start-Up Chile's special services. Private Capital represents the amount the startup raised in USD. Cumulative Sales and Sales Last Year represent sales in USD. The Valuation of the startup is based on a significant transaction or, in its absence, the entrepreneur's self-assessment. Demo Day is estimated with a probit model. All other models are OLS. Standard errors are robust. P-values are presented in parentheses, and *** p<0.01, ** p<0.05, * p<0.1

One plausible explanation for the imperfect expert judgment is that judges are capable of discriminating between the obviously good applicants and the obviously bad applicants, but they are not as good at discriminating between applicants that are neither obviously good nor obviously bad. The inability of selection processes using expert judges to discriminate among projects that are not blatantly bad or good is not too surprising if we look at the way applicants get assigned their scores. To start with, judges differ in their expertise and are susceptible to subjective and boundedly rational decision-making. Therefore, even if judges were identical and graded a given startup in the same way, their ability to predict the future performance of different startups would depend on the alignment between the features of the startup and the expertise of the judges. That is, one might easily imagine how an expert in biotech could more accurately predict the performance of a biotech startup than an e-commerce startup. Therefore, misalignment between startup characteristics and a judge's expertise can be an important source of ineffectiveness.

One way that accelerators have attempted to address the misalignment problem is to rely on a panel of judges, who together offer a broader range of different criteria and expertise. However, a broader range of judges' expertise may inadvertently decrease the power of selection processes if the assignment of judges to start-ups is not judicious. For example, if judges' skill is sector-specific and assignment is not sector-based, then the noise to quality ratio of judges' average scores may increase with the number of judges in the panel. That is, an averaged score is not necessarily an accurate reflection of potential. On one hand, a first judge may have just the right knowledge to accurately assess the potential of a given startup and give it a high score, whereas on the other hand, a second judge may happen not to have the adequate knowledge for that given startup, and give it a low score. Thus, the final, averaged score on which the decision is based will

be confounded by both a precise and an imprecise assessment of future success. As a result, the averaged score would be lower than the score the startup should have objectively received.

Because matching the characteristics of a cadre of applicants to the expertise of a panel of judges is virtually impossible, the selection process inevitably will have a lot of noise (or imprecision). Simply by chance, a lower-potential startup with a favorable match between its characteristics and the panel's expertise may receive a higher score than a higher-potential startup with an unfavorable match between its characteristics and the panel's expertise.

Another major challenge associated with judging processes is the limited time judges are able to spend assessing the potential of a given applicant or contestant. For large-scale application processes (such as Start-Up Chile), a large number of judges are typically summoned. These judges generally participate on a voluntary basis and are required to evaluate multiple applications during a relatively tight timeline. Thus, the amount of information they are able to gather to make an informed decision is not comprehensive (and certainly far from that acquired during a typical due diligence conducted by a venture capitalist). Moreover, judges are not usually allowed to contact applicants to clarify issues in their application that may be critical for the judges' expert assessment of the applicant.

In the case of business-plan or "pitch" competitions, time restrictions are even greater. Expert judges are required to make informed decisions about multiple startups (a typical competition may have 10-15 contestants) based on a presentation of roughly 10 minutes each. Judgments are typically required shortly after the end of the competition, by which judges must try to make sense of the relative future potential of each contestant in order to identify the competition "winners." Again, because these competitions rely on a panel of judges, the same issues discussed previously (averaging the opinions of multiple judges) arise. Moreover, group-decision biases may further add to the noise of the selection process, as judges discuss (and potentially negotiate) their assessments prior to making a final decision about who they believe are the highest-potential contestants. Thus, non-rational aspects may severely taint the final decisions made by a group.

A further challenge in the judging process is the difficulty in separating the potential of the business idea or opportunity from the entrepreneur's potential to discover high-value opportunities in the near future. Essentially, the motor of entrepreneurial success is not the "opportunity" per se, but rather the entrepreneur driving the opportunity discovery process. Rarely do successful entrepreneurs understand the definitive business model that would lead to their success during the early stages of their entrepreneurial process. Rather, as they make

progress toward their initial vision, they gather information that enables them to discover a better business opportunity. For example, Airbnb engaged in more than a year of business-model refinements, from the moment they first thought about renting out their air mattresses until they managed to understand the business model that would lead them to success. Thus, much of the information about the potential of a given application resides in the characteristics of the entrepreneur, and how these characteristics interact with the initial opportunity.

In other words, an entrepreneur's application may describe a low-potential opportunity during the application stage (Airbnb founders were rejected by prominent venture capitalists early on), yet the entrepreneur may have the potential to discover a superb idea during her subsequent entrepreneurial efforts. Thus, for a process of identification (and selection) of future performance to be effective, it must somehow recognize the potential of the individual entrepreneur to discover a high-potential opportunity. However, this ability is non-trivial. Essentially, aside from using proxies for the potential of the entrepreneur (e.g., his or her educational background or experience), one approach to identify potential is to spend enough time with that person to become familiar with his or her unique abilities (and aspirations) to explore, test, persist, and learn.

One accelerator that exploits this mechanism is Village Capital. As described previously, Village Capital relies on the cohort peers to select the highest-potential-performing startups. Thus, at the end of the program, cohort peers vote for the best startups. This approach relies on the principle that peers spend a considerable amount of time with, learning from, and learning about each other. This intense exposure provides peers with information that goes beyond the opportunity per se, allowing them to observe the individual characteristics that may be key for identifying future performance.

6. Gaming the application

Gaming occurs when entrepreneurs tailor their application to increase their chances of being accepted, without changing their underlying opportunity. For example, two identical startups using different presentation strategies will most likely be judged differently. This phenomenon was recognized in SRI International as it realized some of its most interesting technological inventions were not getting funded due to an unconvincing presentation method (Carlson & Wilmot, 2006). Therefore, whether business-plan-competition winners are actually the startups with the highest-potential return on investment, or simply those teams that provide the best

"show" onstage, is unclear. Without further due diligence, differentiating between high future potential and a compelling presentation is difficult. Although this issue is most prevalent in business-plan pitch competitions (e.g., during the special-services and cohort-champion stages), it can also be present at the application stage. If applicants are privy to the unique selection criteria of the accelerator, by emphasizing one aspect over others, judges will be more or less willing to score the application highly—again with no change in the underlying value of the opportunity. For example, The S Factory is an accelerator that aims at supporting female-led startups. Thus, by simply stating during the application stage that the lead co-founder is a woman (when perhaps three coequal co-founders exist, one of which is a woman), the applicants will improve their chances of being accepted, irrespective of their underlying potential.

Of course, entrepreneurs frequently adjust their rhetoric to achieve their goals. Thus, entrepreneurs will naturally tailor their application process (and pitch-competition presentations) to match their audiences' expectations. However, if judges assume all entrepreneurs are tailoring their applications perfectly to the selection processes' expectations, and make an assessment of the applicants' comparative future potential based on this assumption, the selection will most likely fail to select the right applicants. Essentially, the "right" candidate is not necessarily the applicant that is best at tailoring the application to the selection processes' expectations. Thus, the selection process may be prone to errors if it is not able to account for the heterogeneous "gaming" conducted by applicants.

7. Inducing the opportunity

Because incentives and rules influence behaviors, the selection methods and rules at the different selection stages may drive the opportunities the applicants and participants eventually pursue. For example, a given accelerator may indicate a preference for funding startups with a business-to-business business model. This explicit expectation of the selection process will certainly attract those startups that are implicitly of the business-to-business type. However, it will also have an effect on founders who are in the process of creating their business models. A given entrepreneur might have discovered an opportunity that is more suited to a business-to-consumer business model, but to improve her chances of getting into the accelerator, she begins imagining and creating ways to turn the idea into a business-to-business business model. In other words, the selection criteria and processes may drive the types of entrepreneurial opportunities applicants pursue.

This issue is important to keep in mind, especially for ecosystem accelerators. Because their goal is to spur the entrepreneurial ecosystem, by inducing the types of business models the entrepreneurs in the ecosystem imagine and craft, these accelerators might see an unintended crowding out of opportunities the entrepreneurs would have otherwise imagined and created absent this exogenous and opportunity-unrelated factor. Therefore, if the application rules effectively distract entrepreneurs from pursuing opportunities that have a better product-market fit, and induce them to pursue opportunities that have a better fit to the application (at the expense of a better product-market fit), this opportunity-inducing mechanism may actually play against the goals pursued by the ecosystem accelerator in the first place. Essentially, anything that draws entrepreneurs away from pursuing higher-potential opportunities is detrimental to the purposes of creating socioeconomic value.

A second way selection stages can potentially affect entrepreneurial progress is by shifting entrepreneurs' focus from creating a viable business model to creating a compelling pitch. When accelerators place too much emphasis on the pitch competition, entrepreneurs may naturally tend to spend their efforts on improving the "delivery" of their pitch as opposed to improving the value provided to potential customers. This issue is important because if the accelerator's main goal is to help participants raise capital by perfecting their pitch, then its structural elements must differ from those of other programs whose main goal is to help participants create value for customers. In the former case, the emphasis would be on training for the pitch, whereas in the latter, the emphasis would be on creating a viable business model and validating the product-market fit. Thus, the selection method plays a relevant role, because it will condition the behavior of participants. If the institutionalized goal (and corresponding selection method) is to win a pitch competition, participants will likely behave differently than in a context in which the institutionalized goal is to close a deal with a paying customer. Business accelerators must make a conscious effort to align their programmatic milestones, competitions, and selection methods with their desired outcomes. Misalignment on this issue may have a negative effect on accelerators' key performance indicators, and accelerate their demise.

8. Selection speed, a double-edged sword

As emphasized previously, the more time spent on evaluating the performance potential of a given startup, the more likely the judgment will be accurate, which is why early-stage investors rely on due diligences before investing. From this perspective, one may prematurely conclude longer selection processes are better than shorter ones. The key issue with taking too long to

make a selection decision is that high-potential startups will likely find other paths that are not compatible with going through the business accelerator once the accelerator's mind is made up.

For example, take the case of an application selection process that receives applications for a period of three months. Once the application period closes, the accelerator takes another two months to evaluate each application and make a final decision about accepted and rejected applicants. While the accelerator is deliberating, applicants (particularly the high-potential ones) are also searching for alternatives, either by applying to other accelerators or meeting with early-stage investors. The higher-potential startups (the ones the accelerator may want to select) are more likely than the lower-potential startups to receive offers from other accelerators or investors. Therefore, by the time the business accelerator has reached its final verdict, those applicants to whom it sends acceptance letters might already have committed to irreversible decisions that are incompatible with participating in the accelerator. In the case of Start-Up Chile, roughly 15% of accepted applicants decline to participate, presumably because they have committed to other options. Essentially, the longer accelerators take to make a decision about applicants, the higher the likelihood that the higher-potential applicants self-remove from the applicant pool.

Managing the tradeoff between carefully reviewing applications and making a quick decision is not trivial. One way would be to spend greater resources by increasing the number of expert judges. However, this approach may lead to a greater variability in the judging criteria, which may increase the noise of the selection process. An alternative way currently being explored by Leatherbee and del Sol (2016) is the reliance on rational heuristics, which constitute a series of simple rules or cognitive shortcuts organizations can use to make quick decisions in uncertain environments. Theory states that organizations can effectively develop a series of simple rules that can help them outperform other organizations when competitiveness relies on making fast decisions with limited information. Preliminary evidence suggests accelerators can rely on the construction of simple rules to select applicants, and these selection mechanisms are significantly more effective at identifying high-performance applicants than the traditional method of relying on a pool of expert judges. Most importantly, however, using a method such as the one explored by Leatherbee and del Sol may effectively decrease the decision-making process to only a few days.

Conclusion

Selecting the right startups is a key aspect in the success of business accelerators, in a similar way that selecting the right students is key for the success of business schools. However, the effective selection of applicants is a non-trivial activity. It requires a clear understanding about the accelerator's goals (e.g., to invest in the highest-performing startups, or support the entrepreneurs who could benefit the most from the acceleration experience), because the selection criterion can (willingly or unwillingly) filter out applicants with specific characteristics that may be useful for achieving the aforementioned goals.

Business accelerator managers must be aware of the many potential pitfalls and unintended consequences. For example, spending a lot of time evaluating applications may increase the accuracy of the selection process at the expense of losing good candidates that are not willing to wait for a decision from the accelerator. Furthermore, the business accelerator's judging criteria may have an effect on the types of business models pursued by the stock of entrepreneurs in the ecosystem. Thus, selection processes may have the unintended consequence of biasing the types of opportunities pursued in the local ecosystem.

Importantly, one must recognize that current selection methods are far from accurate. Even the most intensive evaluation processes are limited in their ability to separate the right from the wrong candidates. Such limitation means many right candidates are being left out of the accelerator simply because of the weaknesses of the selection process. It also means room remains for improvement. Thus, accelerators that work hard on improving their selection processes are likely to significantly increase their competitive advantage or impact.

References

Carlson CR, Wilmot WW. 2006. *Innovation: The Five Disciplines for Creating What Customers Want,* 1st ed. Crown Business, New York.

Clarysse B, Wright M, Hove J Van. 2015. *A Look Inside Accelerators: Building Businesses. Nesta.* London, February.

Fehder DC, Hochberg Y V. 2014. *Accelerators and the Regional Supply of Venture Capital Investment.* Available at SSRN: https://ssrn.com/abstract=2518668.

Gonzalez-Uribe J, Leatherbee M. 2017. *The Effects of Business Accelerators on Venture Performance: Evidence from Start-Up Chile.* Available at SSRN: https://ssrn.com/abstract=2651158.

Howell ST. 2017. *Learning from Feedback.* Working Paper.

Leatherbee M, del Sol P. 2016. *Predicting Entrepreneurial Performance: Simple Rules versus Expert Judgment.*

Leatherbee M, Katila R. 2016. *Stay the Course or Pivot? Antecedents of Cognitive Refinements of Business Models in Young Firms.* Working Paper Available at SSRN: https://ssrn.com/abstract=2902869.

Wagner RA. 2016. *Does Feedback to Business-Plans Impact New Ventures? Evidence from a Field Experiment.* Working Paper Available at SSRN: https://ssrn.com/abstract=2766566.

Key Performance Indicators

Michael Leatherbee and Juanita Gonzalez-Uribe

ABSTRACT

Key performance indicators (KPIs) can help gauge the health and progress of business accelerators. Their use is fundamental for learning how to improve organizational and programmatic effectiveness, and for building a data-driven shield from program skeptics. However, figuring out which indicators are best, how to develop them, and what phenomenon they are reflecting is a non-trivial exercise. We provide an overview of different KPIs accelerator stakeholders can use. By explaining their value, limitations, methods of construction, and potential pitfalls, we aim to provide accelerator stakeholders with a toolkit for building an effective KPI dashboard.

Business accelerators have the potential to influence entrepreneurial ecosystems and socioeconomic development in multiple ways, well beyond the direct effects they may have on the startups they sponsor. Accelerators can influence the rate of new-business creation (Table 1), early-stage venture investment activity (Fehder and Hochberg, 2014), the flow of foreign entrepreneurial human capital (Leatherbee and Eesley, 2014), the legitimacy of entrepreneurship as a career path, and entrepreneurs' assimilation of valuable entrepreneurial knowledge (Hallen, Bingham, and Cohen, 2016). Because the dimensions of an accelerator's potential impact can be highly orthogonal and the spillover effects can reach far beyond an accelerator's boundaries, figuring out how and what to measure to determine whether an accelerator is making effective headway can be a non-trivial exercise.

Selecting the proper set of key performance indicators (KPIs) is important for assessing the progress of a business accelerator. By keeping a close eye on KPIs, program managers (and sponsors) can gauge the health of their accelerators as they move toward their predefined goals. Selecting and monitoring KPIs is useful because it offers managers the opportunity to learn from failures and successes, and provides the justification to implement organizational or programmatic changes (Locke et al., 1981). However, setting and measuring KPIs can be a double-edged sword. Much like the way pilots rely on the instruments distributed on an airplane's dashboard, focusing on the wrong KPIs can lead managers to incorrectly interpret the state of the accelerator. Analogously, although gauging the outside air temperature can be particularly important for pilots, this knowledge is only secondary to knowing the relative airspeed of the plane. Thus, focusing only on the thermometer at the expense of the airspeed indicator can be potentially disastrous. Such a pilot may easily run the plane aground without even realizing his mistake until it is too late.

In addition to knowing which KPIs are useful for tracking an accelerator's trajectory towards its specific goals, measuring KPIs properly is also important. False readings can misrepresent

the state of the accelerator and cause incorrect (or insufficient) adjustments. Tragic airplane accidents have been caused because ground crew failed to advert the fact that the static pressure port had been taped over for a paint job, thus failing to provide the pilot with the correct altitude reading. Thus, ensuring the information needed to build a given KPI is accurate is a key part of developing an effective KPI dashboard.

Managing a large number of KPIs is not necessarily a good thing. Having too many can be detrimental because individuals (and organizations) are limited in their ability to process information (Simon, 1991). Too many indicators can draw attention away from the key ones, crowding out thoughtful and useful discussions about the accelerator's progress or need for change. Moreover, gathering the information needed to build KPIs requires time and resources. Thus, accelerator managers should be careful to find the right cost/benefit balance. After a certain threshold, incorporating additional KPIs provides decreasing marginal returns, and the marginal benefit of developing and managing an additional KPI may be lower than its marginal cost.

This chapter provides a stockpile of KPIs from which business accelerator stakeholders can draw. It was developed over more than three years of in-depth research of the Start-Up Chile business accelerator program, and supplemented through interviews with multiple business accelerator managers. Moreover, we conducted an extensive review of the finance and entrepreneurship literatures focused on business accelerators, from which we drew several of the KPIs listed here.

Many of the KPIs discussed in this chapter may seem irrelevant to some accelerator stakeholders, because specific goals can be quite orthogonal depending on the accelerator type. Two different accelerators may benefit from two different sets of KPIs. For example, ecosystem accelerators may be interested in gauging spillover KPIs, because their main goal is to spur the domestic entrepreneurship ecosystem. By contrast, investor-led accelerators may be interested in gauging the growth or market-traction KPI of their portfolio startups in an effort to identify high-potential startups early on.

The KPIs listed in this chapter is by no means exhaustive, because business accelerator objectives can vary widely. We may have overlooked some unique goals of specific programs, for which unlisted KPIs could be developed. Our hope is that this chapter provides inspiration to business accelerator stakeholders as they identify and craft their unique dashboard of KPIs, and to researchers as they explore the phenomena underlying business accelerators.

1. Show me who funds you and I will tell you what your goals are

KPIs are intended to reflect, on a regular basis, an organization's progress toward a set of predefined goals. They are useful for guiding behaviors and effort aimed at reaching those goals (Locke, 1996). Thus, when thinking about accelerator KPIs, recognizing that not all accelerators are created equal is important. For example, some accelerators are aimed at spurring socioeconomic development, whereas others are created with the goal of yielding an attractive return on investment for the accelerator's sponsor.

As we have seen in previous chapters, accelerators can be classified into three broad categories: investor-led, ecosystem, and matchmaker (Clarysse, Wright, and Van Hove, 2015). Investor-led accelerators (e.g., Y Combinator, Techstars) are typically aimed at discovering investment opportunities. That is, they have a competitive application process through which they screen startups and select those that appear to offer the most promising investment prospects. Because investor-led accelerators typically take equity stakes in their sponsored startups, a key goal for their portfolio of startups is the achievement of significant transactions that pose positive returns on their investments (Cohen and Hochberg, 2014). Therefore, once accepted into the accelerator, startups are encouraged to focus wholeheartedly on growth. For example, Y Combinator expects their participant startups to grow at a rate of 7% per week.[1]

By contrast, ecosystem accelerators (e.g., Start-Up Chile, Village Capital, and Parallel 18) are typically sponsored by government agencies or non-profit organizations. These accelerators also have a competitive application process but do not require an equity stake in the startups they sponsor. Their aim is to stimulate startup activity in their focal regions, under the expectation that it will spur socioeconomic development. They do so by supporting large numbers of startups (sometimes providing grants) and fostering interaction between the sponsored startups and the surrounding community. Thus, they expect their startups to grow their businesses and spend time on community-related activities. For example, Start-Up Chile requires that participants complete a minimum number of return value agenda (RVA) points during their tenure in the accelerator.[2] For each specific activity, such as mentoring a local entrepreneur or giving a lecture at a school or university, participants earn RVA points. In contrast to investor-led accelerators, ecosystem accelerators have a much broader range of specific goals (e.g., job creation, early-stage investment activity, community engagement). However, unintended effects also arise that accelerator managers do not yet seem to fully understand. We will explore these effects further below.

1. http://learn.onemonth.com/y-combinator-and-the-one-metric-that-matters
2. http://startupchile.org/rva-points-theyre-not-a-bug-but-a-feature/

Finally, large corporations sponsor matchmaker-type accelerators (e.g., Microsoft Ventures Accelerator, Google Launchpad Accelerator). They are typically associated with the corporation's investment arms and are aimed at matching the corporation's customers with potential new service providers (i.e., the startups). Matchmaker accelerators do not typically take equity stakes in the businesses they support, and sometimes provide seed capital. Because of the accelerator's incentive to grow the corporation's business and the technological support network the startups are connected into once accepted into the program, startups typically build their businesses on top of the corporation's existing technological platforms and customer networks. Thus, the goals of matchmaker accelerators include growing the sponsor corporation's business and establishing tighter ties with existing customers through the development of new products or services that use the corporation's existing solutions.

2. Typically used KPIs

To gauge performance, we can classify accelerators' focus of attention into three dimensions: recruitment, acceleration, and spillovers. The recruitment dimension encompasses activities associated with the attraction and evaluation of applicants, with the goal of picking high-potential startups. The acceleration dimension entails the programmatic activities and resources available to the accelerator with the expectation of improving the performance trajectory of participating startups. The spillovers dimension corresponds to the broader effects the activities organized or induced by the accelerator have on stakeholders within the accelerator's ecosystem. Frequently, these spillovers have positive indirect effects on accelerators, as we discuss further below.

2.1 Recruitment KPIs

Having an effective recruitment process is key for accelerator performance and sustainability. "Quality in, quality out" is a principle accelerator managers, computer scientists, and university admissions offices understand well. The better the applicant pool, the more likely the graduates will be high-performing. Venture capitalists operate by this same logic. Being able to attract high-potential applicants and associate the accelerator with high-performing graduates is fundamental at two levels: resources and legitimacy. For investor-led accelerators, having early successful exits can increase the perception by outsiders that the accelerator is effective at improving participant performance, as well as fuel the operation of the accelerator with new funds to invest in new applicants. For example, Techstars accelerator achieved the sale (through

acquisitions) of 20% of its portfolio of startups within a year of becoming established. In addition to providing fresh capital, this achievement also provided validation for its model and much-needed public attention (further helping to attract more high-potential applicants). In the case of ecosystem accelerators, having successful graduates is particularly useful for legitimizing the accelerator's existence in the face of sponsors (governments or non-profit organizations), thus encouraging further financial support to cover the accelerator's operational expenses. Moreover, accelerators can leverage the success cases of their graduates to promote themselves publicly and further attract high-potential applicants, thus pushing the accelerator into a virtuous cycle of attracting and graduating high-performance entrepreneurs.

Recruitment KPIs can be separated into outreach and intake. Outreach encompasses measures of all activities associated with capturing public attention, with the goal of increasing the number of high-potential applicants. Intake encompasses measures of the application process. Outreach and intake are highly related, because successful outreach efforts will likely improve the intake indicators.

Many of these recruitment KPIs reflect the intensity of the activities conducted by accelerator staff. Because these activities can ultimately affect other relevant KPIs, accelerator stakeholders should keep an eye on these indicators. Moreover, exploring relationships between outreach KPIs and intake KPIs can help guide accelerator managers regarding the effectiveness of specific activities. For example, to what extent does social networking activity (an outreach KPI) cause an increase in participant quality (an intake KPI)? And how does participant quality (an intake KPI) relate to company valuation (an acceleration KPI)? Thus, because activities are sometimes easier to measure than outcomes, and to the extent that certain activities are related to performance, accelerator managers might want consider including these KPIs in their dashboard.

Outreach KPIs include the following:

- **Promotional Gatherings:** Corresponds to the number of meetings held to promote the accelerator among prospective applicants. These meetings may be organized and held by the accelerator staff, accelerator participants (who, in the case of Start-Up Chile, get awarded RVA points), or accelerator alumni. These gatherings may be timed around the corresponding cohort application deadline, with the aim of increasing the applicant pool. Depending on the international orientation of the

accelerator, this KPI can be classified into foreign or domestic. Moreover, it can be further dissected to achieve greater granularity by focusing on the average number of attendees per gathering. Some accelerators may further include in this KPI the number of visiting delegations to the accelerator premises.

- **Media Coverage:** Corresponds to the number of appearances in the media. This KPI is an important indicator because public attention in general (and a positive public opinion in particular) is likely to increase the number of high-potential applicants. Media coverage can be further dissected into foreign and domestic, and positive and negative.

- **Social Network Activity:** Corresponds to the measure of presence in social network platforms such as Facebook, Twitter, YouTube, Instagram, and LinkedIn. The intensity of social network activity is likely to influence application rates in a similar way as media coverage, and can be further dissected in the same way.

Intake KPIs include the following:

- **Applicant Count:** An important indicator commonly used by accelerator managers. The volume of applicants reflects the general appeal of the accelerator from the perspective of entrepreneurs. In principle, the larger the applicant pool, the higher the likelihood of identifying high-potential entrepreneurs. However, this indicator alone can be misleading if not complemented by others that proxy for the quality of the applicant pool. For example, an increase in the number of applicants may reflect a specific outreach activity in a new market (e.g., press coverage in a specific country); however, applicant entrepreneurs may not necessarily be higher in potential performance.

- **Acceptance Rate:** Reflects the ratio of accepted to all applicants. Depending on whether the accelerator has a fixed budget constraint (and hence the number of potential participants is also fixed for each cohort), this KPI can substitute for the Applicant Count KPI. However, sometimes accelerators select based on budget availability or on the perceived quality of applicants, funding as many applicants as they deem surpass a given quality threshold.

- **Development Stage:** Corresponds to the level of maturity of applicant startups. For example, Start-Up Chile classifies applicants from concept (founders are at a very early stage) to scaling sales (the startup is in the growth stage). Because having more validated startups decreases the risk of portfolio failure, one might naturally expect accelerators to push to increase their development-stage KPI. Figure 1 shows how Start-Up Chile tracks both Applicant Count and Development Stage KPIs. The graph suggests an evolution in the applicant pool between 2015 and 2016 toward a higher development stage.

- **Participant Quality:** Corresponds to the quality of the individual participants. It is an important indicator because it directly influences the acceleration and spillover goals of accelerators. The higher the quality of participants, the higher the likelihood of having successful alumni who will contribute either directly with resources (as in the case of an exit event for investor-led accelerators) or with legitimacy (by which accelerators leverage the success and media coverage of their alumni). Quality can be gauged by comparing the judging scores between one application process and another. Although this measure is not exact or precise (because judges may be different at each application process, and scores may carry significant levels of subjectivity), the indicator can be complemented by other proxies. For example, participant quality can be estimated using the university rankings where they studied, their level of education, or prior work experience.

- **International Representation:** Refers to the proportion of foreign applicants. This indicator is particularly useful for those programs that aim at attracting entrepreneurs to their regions. Assuming the judging criterion is country-agnostic, comparing the distribution of applicants against the distribution of participants can be useful in identifying the countries from which high-potential entrepreneurs are coming. Moreover, a low representation of a specific country in the participants list may reflect an ineffective outreach strategy.

- **Industry Distribution:** Refers to the types of industries represented in the application pool. Some accelerators are industry focused, in which case this KPI can help to indicate whether the outreach efforts are targeting the industries of greatest interest.

- **Demographic Distribution:** Some accelerators are driven by the goal of positive action in their selection process. Thus, demographic-distribution KPIs (e.g., gender, ethnicity, or locality) are useful in supervising the achievement of this goal.

- **Processing Time:** Corresponds to the time it takes to process applications. Accelerators typically take about two months between the application deadline and the acceptance decision, which can be a long time for fledgling startups. The problem from the accelerator's perspective is the potential loss of high-quality startups. High-quality startups are very likely to find funding elsewhere within the two months accelerators take to make a decision. Thus, when the final verdict is made about who was selected, a non-trivial proportion of the selected applicants reject the offer because they already found funding elsewhere. A long processing time can jeopardize the quality of the incoming cohort, because the best startups may be lost to other accelerators or investors.

FIGURE 1
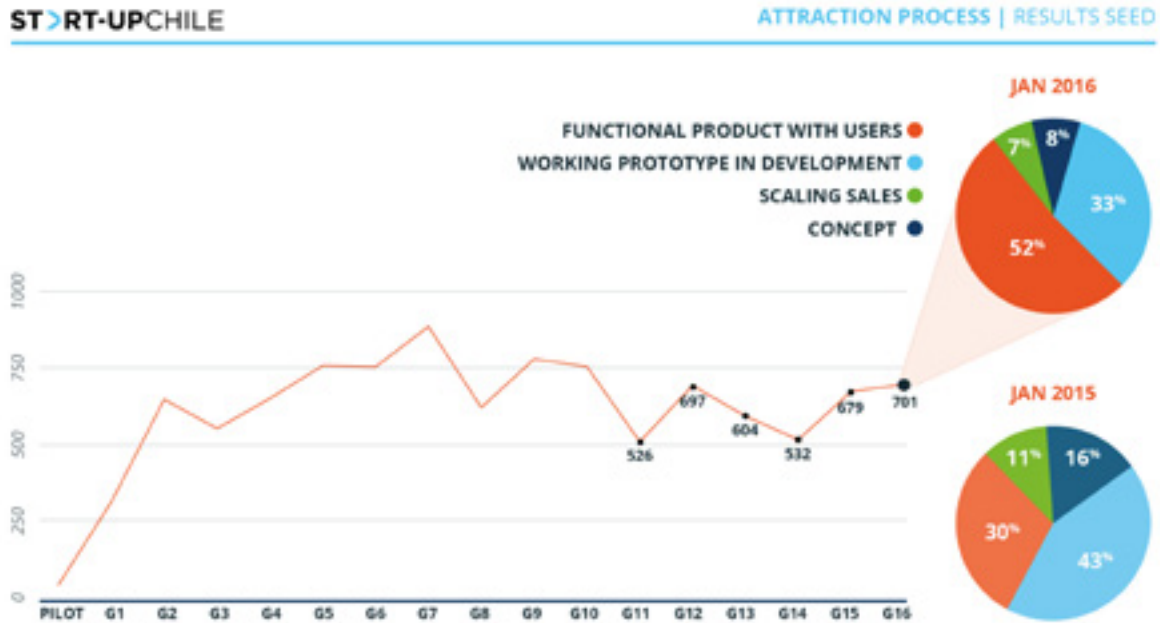
2.2 Acceleration KPIs

New-venture-performance acceleration is the key promise of business accelerators. This promise is important because it is one of the main reasons entrepreneurs compete to be accepted into these programs. Thus far, accelerators have typically used the performance metrics of their alumni as KPIs that indicate actual acceleration effects. They promote this information in an effort to attract better applicants. Moreover, many accelerators even argue the success of their alumni is proof that they are successfully delivering on the promise of acceleration. In turn, this message sometimes induces the press and potential applicants to become excited by the apparent prospects of acceleration. However, concluding that a given accelerator indeed provides an acceleration effect by looking exclusively at the performance of alumni can be very misleading.

Whether business accelerators indeed accelerate and how acceleration occurs are non-trivial questions.[3] How can we know accelerator alumni are doing well because they participated in a given accelerator and not because they were going to do just as well on their own (in the absence of the accelerator)? Without a valid counterfactual for accelerator alumni (i.e., a control group), knowing what would have happened in a parallel universe where those same alumni did not have the business accelerator experience is impossible. Moreover, assuming accelerators do add value to participants, how exactly does this happen? Do they have better mentors, supervisory processes, workshops, and participants, or are they simply better connected to value-adding financiers?

Answering these questions for each specific accelerator is very important for accelerator managers, sponsors, and applicants. Even though the acceleration conundrum (whether an accelerator accelerates) may be less important today for investor-led accelerators (because one of their key goals is to attract and identify good investment opportunities, regardless of whether they actually accelerate because of the accelerator), it should become very relevant as more information becomes publicly available about the real (causal) effects of each business accelerator. For instance, we could imagine a near future in which causal estimates of the acceleration effects of different business accelerators are publicly known, enabling applicants to select accelerators based on their real promise of acceleration, and not on the performance reports of their alumni. Once robust evidence of the acceleration effects for specific accelerators emerges, accelerator managers will have to strive to improve (or fix) their programmatic interventions in order to remain an attractive option to potential applicants. For example, a recent study on the effects of Start-Up Chile on new venture performance found that specific programmatic aspects of the accelerator caused an improvement in startup performance by 20% to 40% (Gonzalez-Uribe and Leatherbee, 2017). As a result, Start-Up Chile's managers refocused their efforts on the aspects that were proven to work effectively, further extending their service to all accelerator participants (as opposed to the select few for which the service was originally designed).

In the case of ecosystem accelerator sponsors (particularly for non-profit sponsors who do not take equity stakes in participants' startups), knowing whether the accelerator actually has an effect (on whatever goal the sponsors are interested in) is especially important. As any sensible person would, accelerator sponsors are interested in knowing whether the resources they are giving away indeed serve the purpose of reaching the goal(s) they are trying to achieve. For

---

3. *Recent studies focused on this question include Gonzalez-Uribe and Leatherbee (2017) and Hallen, Bingham, and Cohen (2016).*

example, ecosystem accelerator sponsors may be interested in encouraging job creation, in which case they would want to know whether participating in the accelerator has a causal effect on the employee count of startups. By focusing exclusively on the employee count KPI of alumni startups (without comparing that count to a valid counterfactual), sponsors will never know whether the startups they supported would have created as many jobs had they not consumed sponsor resources.[4]

For applicant entrepreneurs, understanding the difference between the real acceleration effects from a given accelerator and the innate performance abilities of the accelerator's alumni is also very important. Accelerator applicants believe getting into the right accelerator is important for their startup trajectory, in the same way that business school applicants believe getting into the right business school can improve their professional prospects. However, most of the existing information on the supposed acceleration effects does not help accelerator applicants make an informed decision. If anything, the information can be potentially misleading, because interpreting alumni performance as a signal that a given service will deliver on a performance-enhancing promise is not a robust interpretation. Thus, in the absence of evidence about real acceleration effects, entrepreneurs cannot be sure participating in that specific accelerator will actually benefit them.

We know that business accelerators, in general, can positively influence new venture performance by improving the entrepreneurial capital of participants through entrepreneurship schooling (Gonzalez-Uribe and Leatherbee, 2017). However, the specific dimension in which a given accelerator can have an effect on a specific population will most likely depend on the context and programmatic elements of that accelerator. For example, some accelerators may be best at helping participants secure follow-on funding, others may be best at scaling participants' market traction, and others may be best at fostering employee growth. Given the proper evaluation procedures and metrics, accelerators could not only know whether they are helping their participants, but also in which dimensions they are particularly good at doing so. Moreover, by making this information public, applicants could make more informed decisions about which accelerators they need in order to achieve their goals. Thus, we could imagine that applicants who wish to secure venture capital would prefer those accelerators that are best at securing

---

4. Unless acceptance into the accelerator is decided randomly, a comparison of average performance of participants against the average performance of non-participants is not helpful for causal inference, because the selection process may be screening innate high-performing applicants from low-performing ones.

follow-on funding to accelerators that are best at helping entrepreneurs build market traction. If a particular entrepreneur were not keen on raising venture capital (perhaps because she prefers an organic growth strategy), she should probably steer her startup away from accelerators that are effective at getting her funded by venture capitalists. Of course, sometimes these different dimensions (market growth and follow-on funding) go hand in hand—but not always.

In principle, a greater focus on estimating real acceleration effects (as opposed to the delusion of acceleration) should also improve the system-wide impact of accelerators more broadly. In the same way that transparency and a focus on robust and meaningful KPIs improve decision-making in other social settings, this approach could help accelerator managers, sponsors, and applicants. Making an effort to increase their ability to determine the real effects of each accelerator program would behoove business accelerator stakeholders. This effort would improve decision-making, programmatic design, accountability in the face of sponsors, and ultimately socioeconomic development.

Setting up the capability to determine the real acceleration effects of accelerators can be quite simple and straightforward, barring a few key (and relatively trivial) restrictions that must be put into place. For example, the Capital Semilla (Seed Capital) business incubator program of Chile's Ministry of Economy recently implemented the structural elements in its selection process that will allow them to determine the real effects of the program. The program did this by establishing a few rules in its selection criteria and relying on a regression discontinuity design (cf. Leatherbee, Frias, and Gonzalez, 2016).

Business accelerators commonly use acceleration KPIs to gauge alumni performance. Thus, accelerators are well on their way to being able to establish the structural and methodological elements that will allow them to determine their real effects on participant acceleration. However, one must keep in mind that even though accelerators may use the following acceleration KPIs, if they do not compare them against a valid counterfactual, these KPIs should not be interpreted as real acceleration effects. At most, they can be interpreted as a measure of the quality of their participants and alumni.

Acceleration KPIs typically used include the following:

- **Market Traction:** Corresponds to the indicator of the appeal of the product or

service developed by the startup, combined with the ability of the startup to reach the target market. If the value proposition of the startup is theoretically appealing, but the founding team is not competent at reaching potential customers, market-traction KPI may remain low. The opposite is also potentially possible. For example, by using "growth-hacking" techniques, startups can gain much social network activity (e.g., Twitter mentions). However, if the product or service is not appealing enough, growth will eventually tail-off. Typical measures for this KPI include the amount of registered users, Facebook likes, website visits, Twitter mentions, and sales.

Of course, the relevance of these measures depends on the startup's business model. For example, business-to-consumer startups may have higher measures for registered users and Facebook likes than business-to-business startups, simply because the volume of consumers is greater than that of businesses. Therefore, a comparison between different startups in the same cohort must be conducted with care. By contrast, a comparison of the average of any of these measures between the participants (or alumni) and a valid counterfactual group can be quite informative, because it will reflect the real acceleration effects for the market-traction KPI.

- **Employees:** Corresponds to the number of employees working for a given startup. This KPI can be dissected into measures of full-time and part-time employees. Because job creation does not necessarily indicate profitability or return on investment, this indicator is less relevant for investor-led and matchmaker accelerators. However, it is typically a very relevant KPI for ecosystem accelerators because job creation is commonly equated with socioeconomic development (a key goal for these programs).

- **Fundraising:** Corresponds to the act of securing follow-on, third-party investment by startups. Raising capital has been commonly viewed as a measure of success, because it indicates a third-party opinion that the startup has upside potential. However, it is important to keep in mind that raising capital is not the only path to success. Many successful startups have grown organically by capitalizing on sales. Thus, a low fundraising KPI may be a reflection of the startup's ability to postpone fundraising (thus increasing its pre-capital valuation) or of the founders' preference to keep a greater percentage of ownership in the hands of the founding team.

Understanding that fundraising is partly a strategic choice made by the founding team (i.e., not necessarily a measure of success), one must be careful in comparing accelerator alumni against a counterfactual group. A higher average fundraising KPI may simply be an indication that the accelerator experience influences the strategic choice of founders (to search for fundraising), and not necessarily an indication of the measured startups' higher potential for success.

Typical measures used for this KPI are the indicator of the fundraising milestone (i.e., whether a relevant transaction was completed) and the amount raised. For example, Gonzalez-Uribe and Leatherbee (2017) found that participation in Start-Up Chile's entrepreneurship school increased a startup's likelihood of fundraising (as a relevant transaction milestone) by 21%. They also found that startups participating in the entrepreneurship school saw a threefold to sixfold increased in the amount of capital raised.

- **Valuation:** Corresponds to the pre-money valuation of the startups in the face of a relevant transaction. Post-money valuation can be used as an alternative measure, but care must be applied when gathering and analyzing data to avoid confusion between pre-money and post-money measures. For example, the estimated effect of participation in Start-Up Chile's entrepreneurship school was a fivefold increase in pre-money valuation (Gonzalez-Uribe and Leatherbee, 2017).

  The more objective source of this measure is typically captured by a relevant transaction (e.g., fundraising). However, the same fundraising KPI caveat applies here. To the extent that accelerator participation influences the founders' capitalization strategy, biases may exist when comparing participants against their counterfactual. That is, the inexistence of a relevant transaction must not be equated with a low valuation. Therefore, an alternative approach could be to ask founders directly what their self-assessed valuation is. Although this measure may be inflated by respondents' over-optimism, this bias is likely to be similar for accelerator participants and their control group.

- **Profits:** Corresponds to the measure of a startup's profits for a predefined period (e.g., the last 6 to 12 months). The founding team typically self-reports this measure.

Although profits (as opposed to losses) are certainly a reflection of the financial health of a startup, they are not a perfect measure of future potential. Many times, founding teams may systematically reinvest their monthly profit margins into growth opportunities (e.g., new employees or marketing), which would be reflected in a temporary decrease in the profits KPI.

- **Survival:** Corresponds to the startup's state of operation. This KPI is typically quantified as a binary variable, where being "alive" is codified as 1 and "shut down" is codified as 0. For example, Yu (2015) found investor-led accelerator startups are less likely to remain alive than non-accelerated (comparable) startups. By contrast, Gonzalez-Uribe and Leatherbee (2017) found no evidence that ecosystem accelerators affect startup survival on average. However, they did find the performance KPIs for accelerator participants appear more disperse than for non-participants. Together, these studies suggest accelerators may be actually accelerating the death of low-potential startups, while simultaneously accelerating the growth of high-potential startups.

  Whether participating startups survive can be particularly relevant for investor-led accelerators, because these accelerator sponsors have equity stakes in the startups they support. However, survival rates may be less relevant for ecosystem accelerators, because their main goal is the promotion of socioeconomic development through entrepreneurship, and therefore the level of analysis that matters most is the founder, not the startup. Ultimately, the source of value creation is the founder, who in turn must have the drive and skills to create a startup that will eventually contribute to socioeconomic development.

  For example, a given low-potential startup may fail faster as a consequence of participating in the accelerator, as suggested by the findings of Yu (2015) and Gonzalez-Uribe and Leatherbee (2017). This outcome can be positive, because productive factors (i.e., the entrepreneur) will be removed from a low-productive activity (i.e., running a low-potential startup). At the same time, the accelerator experience may teach participants how to discover higher upside-potential opportunities and build better startups, as suggested by the findings of Hallen, Bingham, and Cohen (2016), Wagner (2016), and Leatherbee and Eesley (2014). Thus, by accelerating the demise of low-

potential startups, the corresponding founders become free to leverage their newly acquired skills and knowledge to create a higher-potential startup.

Although this reasoning is still mostly theoretical, findings by Gonzalez-Uribe and Leatherbee (2017) provide suggestive evidence that the accelerator experience induces founders to persist in their careers as entrepreneurs. That is, although the average failure rate between accelerated and non-accelerated startups in ecosystem accelerators is similar, the rate of individuals who continue to be entrepreneurs several years after participating in the accelerator is higher. Essentially, founders of failed startups who go through the accelerator experience are more likely to try to build new startups vis-à-vis non-accelerated founders. Therefore, the use of survival as a KPI must be interpreted with care, and should be dissected into two complementary measures: the survival of the startup and the persistence of the individual as an entrepreneur.

- **Growth Rate:** Corresponds to the period-over-period growth rate of any given measure that is relevant for the specific startup. For example, some investor-led accelerators register week-over-week growth rate, and argue that anything below a 7% growth rate is underperforming. Measures can include Facebook likes, sales, registered users, website visits, application downloads, and number of customer reviews (e.g., for apps). The growth-rate KPI as an extrinsic motivator can be potentially useful for founders, because it provides quick performance feedback and can help keep founding teams under constant pressure to outperform (Latham and Locke, 2006).

  However, using this KPI as a comparison between startups can be challenging. The relevant measures can differ for different business models, thus rendering comparability between startups more challenging. For example, one of Instagram's growth-rate KPIs was user subscription. However, before being purchased by Facebook for roughly one billion dollars, Instagram had no sales to report. Thus, comparing comparable startups is key for gaining reasonable insights from this KPI.

  Assessing the effect of a given accelerator on the average startup growth rate can be particularly useful. As has been emphasized previously, the key to successful assessment

is the construction of a valid counterfactual group that can be systematically monitored in the same way as the accelerated group. Insights on the growth-rate effect may serve as a means by which accelerator managers can test which programmatic interventions work best, and promote their growth-acceleration capabilities (if any) to attract higher-quality applicants.

2.3 Spillover KPIs

Spillovers are particularly relevant for ecosystem accelerators, whose key goal is to spur domestic socioeconomic development. However, they are also relevant (although more indirectly so) for investor-led and matchmaker accelerators. Essentially, a healthy entrepreneurial ecosystem is like a rising tide that raises all boats. For example, the prestige of Techstars in Boulder, Colorado, or Start-Up Chile in Santiago has driven many entrepreneurs to migrate to these locations, despite not being selected into the accelerators. These migration forces increase the supply of business opportunities and human capital, as well as knowledge and access to new networks potentially useful to domestic entrepreneurs. Such changes are advantageous for early-stage investors, because investors benefit from the availability of greater numbers of higher-quality entrepreneurs. Moreover, a migration of entrepreneurs increases market competition, which helps to erode potential monopolistic features in the economy that typically preclude the creation of new value from reaching the broader population of consumers. Therefore, keeping a close eye on the effects accelerators have beyond their organizational boundaries is of great importance.

Spillover KPIs are less trivial to pin down than acceleration KPIs, because the former are typically non-obvious and unexpected. For example, Fehder and Hochberg (2014) found the establishment of an accelerator in a given location considerably increased early-stage investment activity in startups, many of which were not affiliated with the accelerator. Moreover, findings by Leatherbee and Eesley (2014) suggest domestic entrepreneurs can learn skills and knowledge that is not readily available in the local ecosystem, as a consequence of interacting with foreign entrepreneurs who bring unique skills and knowledge from abroad. These unexpected skills and knowledge may grant domestic entrepreneurs a greater toolbox from which to build higher-performing startups.

Spillover KPIs typically used include the following:

- **Relocation:** Corresponds to the indicator of entrepreneurial immigrants who remain in the host region. For example, one of Start-Up Chile's goals is to attract (and retain) high-potential entrepreneurs from overseas with the aim of contributing to domestic socioeconomic development. The relocation KPI can be counted as the number (or proportion) of participant foreign startups that remain in the domestic locality after a given time period. However, because founders typically outlast startups, a potentially better measure is the number of foreign entrepreneurs who remain in the domestic region (regardless of whether the original startups remain in existence).

  One of the challenges of this KPI (and spillover KPIs in general) is the identification of the source of the effect. That is, relocation may not just be a consequence of participating in the accelerator: it may also be a consequence of the outreach activities abroad that may help paint an attractive picture for immigrant entrepreneurs, regardless of their participation in the accelerator. Thus, counting only the number of foreign participants who decide to relocate to the host locality may be an incomplete measure for this KPI. To learn about this secondary effect, accelerators could work with immigration offices to identify the source that motivated the relocation (which may have been the accelerator's prestige abroad or its outreach efforts).

- **Vicarious Founding**: Corresponds to the number of startups created in the locality of the accelerator that did not directly participate in the accelerator. For example, table 1 shows the results of a difference-in-differences methodology that compares business-creation rates before and after the inception of the Start-Up Chile program. After Start-Up Chile was created, 6% more companies registered in the localities around (and in the industries akin to) Start-Up Chile, compared to localities and industries unrelated to Start-Up Chile (column 4).

TABLE 1- REGIONAL EFFECTS: NEW-BUSINESS REGISTRATION RATES

	(1)	(2)	(3)	(4)
	Number	Number	Log	.Log.
Post 2010× Contiguous	0.314***		0.024***	
	(0.097)		(0.005)	
Post 2010× Contiguous ×Venture		0.483**		0.060***
		(0.213)		(0.022)
Observations	426,180	426,180	426,180	426,180
R-squared	0.043	0.900	0.062	0.783
Comuna FE	YES		YES	
Year FE	YES		YES	
Industry×Year FE		YES		YES
Industry×Comuna FE		YES		YES
Comuna×Year FE		YES		YES

This table reports the regional effects of the program on new-business registration rates. Estimates in columns (1) and (3) are based on the regression , where corresponds to the number and logarithm of new businesses registered in comuna c, industry i, and time t, respectively, and is a dummy that equals 1 after 2010 (i.e., the inception year of the program) and equals 1 if the comuna neighbors the comuna where the program is headquartered. In detail, the contiguos comunas correspond to Independencia, Providencia, Nunoa, San Joaquin, San Miguel, Pedro Aguirre Cerda, Estacion Central, Quinta Normal, and Santiago Central. Estimates in columns (2) and (4) are based on the regression , where equals 1 for all those industries similar to the industries of the program's participants (i.e., venture industries): activities of experimental research and development, auxiliary transport activities, business-to-business services, information services, other types of financial intermediation, and retail trade not realized in shops, telecommunications, and travel agencies. Robust standard errors are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

- **Domestic Jobs:** Corresponds to the jobs created domestically by the participating startups. The distinction between domestic and non-domestic jobs created is important given that many participating startups may open offices abroad, and foreign startups may return to their localities of origin. As with the relocation KPI, identifying whether the accelerator's existence is causing foreign non-participants to relocate to the host locality, subsequently creating startups and new jobs, is not trivial. This measure can be further complemented by the salary of the jobs created and the demographics of the employees. As would be expected, higher-paying jobs likely reflects the greater value-creation capability of the corresponding startup.

- **Venture Investments:** Correspond to the early-stage investment activity occurring in the accelerator's region of interest. A direct measure of this KPI can be obtained by following accelerator alumni. However, as Fehder and Hochberg (2014) show, the existence of an accelerator in a given region also has the indirect effect on increasing early-stage investments for non-accelerated participants. This KPI can be dissected into the number of early-stage investment deals and the amount invested in them.

- **Taxes Paid:** Corresponds to the taxes paid by alumni startups in the locality of the accelerator. This KPI is relevant only for ecosystem accelerators, particularly those sponsored by governments. This measure can be estimated based on the sales and profits KPIs. As before, the only way to determine whether the return on investment of sponsor funding is positive is by comparing the additional taxes paid by the accelerator's alumni, compared to a counterfactual group of non-participants. By focusing only on alumni taxes paid, accelerators sometimes make happy (but incorrect) calculations of the return on investment of sponsor funds.

- **Alumni Demographic Distribution:** Corresponds to the proportion of alumni who represent a given demographic category. For example, some ecosystem accelerators promote positive action toward female entrepreneurs. Thus, this KPI could compare the number of female alumni who remain as entrepreneurs against a valid counterfactual. This KPI could also be used to compare against the proportion of female participants in order to explore whether the accelerator is having a differential effect on female entrepreneurs. Of course, measures must be taken to ensure the comparison has a valid counterfactual (e.g., by looking at the differential effect on a group of similar female entrepreneurs who did not participate in the program).

- **Community Service:** Corresponds to a measure of the activities ecosystem accelerator participants conduct to promote entrepreneurship or entrepreneurial thinking in the accelerator's locality. For example, one of the conditions for participation in Start-Up Chile is that entrepreneurs complete a series of community service tasks before graduation from the accelerator. Such tasks could include being a mentor to a domestic entrepreneur, giving a class at a local university, or giving a lecture to high school students. Thus, this KPI could be constructed as the number of given tasks and the amount of people who benefited from each task.

- **Institutional Change:** Reflects the changes in the beliefs, behaviors, and regulations of the host locality. Unsurprisingly, cultures differ among societies. For example, Leatherbee and Eesley (2014) found Chilean entrepreneurs (from Santiago) had significantly different entrepreneurial behaviors than entrepreneurs from Silicon Valley. A key question that is particularly relevant for ecosystem accelerator sponsors is whether the accelerator prompts changes in the domestic institutions. Leatherbee and Eesley's (2014) findings suggest domestic entrepreneurs began behaving more like foreign entrepreneurs after the six-month interaction that was prompted by Start-Up Chile. Moreover, as soon as Start-Up Chile was created, the accelerator managers realized they needed to find a way to expedite the work-visa process. Otherwise, their foreign selected participants (roughly 75% of each cohort) would not be able to attend. Because the accelerator was government sponsored, the accelerator managers were able to find a way to drastically reduce the work-visa processing time, achieving a relevant change in the country's immigration norm.

3. How to measure accelerator KPIs

The typical way most of these KPIs are measured is by surveying accelerator participants and non-participants. Participants are more likely to provide high response rates during their tenure in the program. However, getting good response rates over time is not trivial. Response rates typically drop with alumni, and drop even further with non-participants. Therefore, the periodicity of surveys must be chosen with care. In general, the greater the frequency of surveys, the more annoyed the sampled population may get. The lower the level of perceived affiliation of the surveyed population, the higher this annoyance factor (i.e., participants will be more willing than non-participants to spend time on an accelerator survey). The same rings true for the length of the survey. The more KPIs an accelerator wants to keep track of, the longer the

survey. Therefore, for better results, accelerators managers should think carefully about the most relevant KPIs they wish to keep track of, and the survey frequency that maximizes the right combination of response rates and valuable data.

For many of the acceleration KPIs, an alternative (and less invasive) approach can be particularly useful. KPIs such as market traction, employees, fundraising, valuation, and survival can be captured from online sources. For instance, Gonzalez-Uribe and Leatherbee's (2017) study on the acceleration effects of ecosystem accelerators compares web-based metrics against survey-based metrics. Their results offer two key insights. First, their online metrics are significantly correlated with survey-based metrics, which implies the latter can be (at least partially) replaced by the former. This implication is important because online metrics can be captured with greater frequency without disturbing entrepreneurs. Second, as revealed in the authors' results, survey based metrics can suffer from response bias (successful participants are more likely to respond). Moreover, socially desirable responding may also be at play. For example, non-participants may wish to over-represent their results as a way to signal to accelerator staff that they missed out by not accepting them into the program.

Other KPIs can also be captured without having to interact with entrepreneurs. For example, the data to build the vicarious founding or the venture investments KPIs aimed at testing spillover effects can typically be acquired from company registration government agencies.

4. Accelerator spillovers as a public good

The number of accelerators (whether investor-led, ecosystem, or matchmaker) has grown considerably in the last decade. However, the programmatic design of accelerators is far from being consolidated. Accelerator managers are still working on figuring out the best model for their specific goals. For example, Start-Up Chile is currently undergoing a randomized control trial to test the performance-enhancing effects of specific programmatic interventions.

One question that emerges is how the programmatic changes that are being enacted will affect the spillover benefits for entrepreneurship ecosystems. While ecosystem accelerators will reshape their programmatic design to maximize the social benefits of accelerators, investor-led accelerators are starting to reshape their programmatic design to maximize the capture of individual benefits, potentially at the expense of spillovers. For example, investor-led accelerators currently do not encourage (and implicitly discourage) community service. However, they contribute to spillovers (perhaps unwittingly) by hosting demo-days. As Fehder and Hochberg

(2014) argue, the periodic demo-days at which accelerators showcase their best startups among early-stage investors in the ecosystem (regardless of their formal affiliation with the accelerator) are an important contributor to the ecosystem. These demo-days seem to foster a unique cadence in the early-stage investment community, by which potential investors maintain active conversations about investment opportunities. Through these conversations, potential investors compare themselves socially (Festinger, 1954) and mimic investment behaviors.

The investor-led accelerator demo-day, as a programmatic activity that spills over to the entrepreneurship ecosystem, is currently under scrutiny. According to the manager of one investor-led accelerator, by helping startups grow and showcasing their potential to external investors (who are not affiliated with–and do not sponsor–the accelerator), the value created by the accelerator is being appropriated by third parties. Thus, these external investors are freeriding on the resources of accelerator sponsors. As a consequence, this accelerator was planning to discontinue its demo-day.

Whether other accelerators will mimic these programmatic changes conducted by a few accelerators is not evident. Nor is predicting whether these changes may cause further beneficial spillovers for entrepreneurship ecosystems trivial. However, it is important to realize the existence of accelerators (as the organizational form they have today) adds value to the entrepreneurship ecosystem—and by extension to socioeconomic development. As individual forces find ways to capture the value created by accelerators, it behooves societies to keep an eye on the programmatic changes that may occur for the benefit the individual, at the expense of the collective.

Conclusion

Business accelerator key performance indicators can be classified into three dimensions: recruitment, acceleration, and spillovers. Depending on the organizational goals of each accelerator, the different dimensions (and specific KPIs underlying them) will be more or less relevant. For KPIs to be meaningful, establishing a comparable baseline is important. This baseline can be a control group of comparable startups that do not receive acceleration services, similar startups within the same accelerator, other comparable accelerators, or measures of economic growth absent the accelerator. The key is to make sure the KPIs that are used are contrasted against a relevant backdrop. Otherwise, decision makers may fall into the trap of reaching inaccurate conclusions.

Choosing the right KPIs is key for organizational performance. On one hand, the lack of meaningful KPIs can be detrimental because organizations need feedback about their actions in order to learn, adapt, and improve. On the other hand, having too many KPIs can also have a detrimental effect, because they increase operational costs (gathering and analyzing the KPIs) and cognitive load (confusing decision makers). Therefore, the optimal number of KPIs is most likely fewer than the number presented here.

Selecting meaningful KPIs from among multiple possibilities requires a deep understanding of the mission of the accelerator, and the phenomenon underlying each KPI. On one hand, if a given KPI does not help accelerators gauge progress toward their goals, managing that KPI is a waste of resources. On the other hand, a naïve belief in a given KPI (without understanding the underlying entrepreneurship phenomenon the KPI is reflecting) can lead an accelerator's decision-making down the wrong path. Therefore, when thinking about the select few KPIs an accelerator must work to include into its dashboard, carefully contemplating the organizational goals and the underlying phenomenon reflected by a given KPI is important.

The business accelerator is a key ingredient in healthy entrepreneurship ecosystems. A thoughtful analysis of KPIs will serve the purpose of improving the effectiveness of accelerator programs. A better understanding of the ways accelerators influence these ecosystems will help accelerator managers, their stakeholders, and entrepreneurs make better decisions, thus accelerating socioeconomic development.

References

Clarysse B, Wright M, Hove J Van. 2015. *A Look Inside Accelerators: Building Businesses.* London, February.

Cohen SG, Hochberg Y V. 2014. *Accelerating Startups: The Seed Accelerator Phenomenon.*

Fehder DC, Hochberg Y V. 2014. *Accelerators and the Regional Supply of Venture Capital Investment.*

Festinger L. 1954. A Theory of Social Comparison Processes. *Human Relations* 7(2): 117–140. Available at: http://hum.sagepub.com/cgi/doi/10.1177/001872675400700202.

Gonzalez-Uribe, J and Leatherbee, M. 2017. *The Effects of Business Accelerators on Venture Performance: Evidence from Start-Up Chile.* Available at: https://ssrn.com/abstract=2651158

Hallen BL, Bingham CB, Cohen SLG. 2016. *Do Accelerators Accelerate? A Study of Venture Accelerators as a Path to Success.* Working Paper.

Latham GP, Locke EA. 2006. Enhancing the benefits and overcoming the pitfalls of goal setting. *Organization Dynamics*, 35(4):332-340.

Leatherbee M, Eesley CE. 2014. *Boulevard of Broken Behaviors: Socio-Psychological Mechanisms of Entrepreneurship Policies.* Available at: http://ssrn.com/abstract=2488712.

Leatherbee M, Frias R, Gonzalez M. 2016. *Diagnóstico y Recomendación del Método de Selección del Programa Capital Semilla.*

Locke EA. 1996. Motivation through conscious goal setting. *Applied & Preventative Psychology* 5: 117-124.

Locke EA, Shaw KN, Saari LM, Latham GP. 1981. Goal setting and task performance: 1969-1980. *Psychological Bulletin* 90: 125-152.

Simon HA. 1991. Bounded Rationality and Organizational Learning. *Organization Science* 2(1): 125–134.

Yu S. 2015. *The Impact of Accelerators on High-Technology Ventures.* Working Paper.

PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE

EPIC LAB

EVIDENCE-BASED POLICY & INNOVATION
RESEARCH LAB

ACCELERATORS

ESCUELA DE INGENIERÍA
FACULTAD DE INGENIERÍA