

Commission for Technology and Innovation CTI

CTI impact analysis: Start-up promotion – coaching

Final report on 2016 analysis – Summary

31 January 2017

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Summary

Introduction

The Commission for Technology and Innovation (CTI) is the federal innovation promotion agency. The CTI promotes science-based innovations by means of various programmes. The majority of CTI funds are used for research and development projects (R&D projects) between business partners and publicly recognised research institutions (some CHF 110-130 million per year). Science-based start-ups and entrepreneurship in general receive around CHF 10 million a year in funding. This primarily takes the form of coaching for founders of science-based start-ups and entrepreneurship courses at universities for (prospective) entrepreneurs.

The CTI is currently undergoing a transformation to become an institution under public law (the Swiss Innovation Promotion Agency - Innosuisse), which will be operational from 1 January 2018.

In order to gauge the impact of its innovation promotion activities and to enhance controlling, the CTI launched a WTO call for tenders in 2015 for impact analyses in the areas of R&D Project Funding and Start-up and Entrepreneurship. This document is the 2016 report on the impact analysis of CTI's start-up promotion. A second report focusing on a longitudinal analysis is planned for 2018.

Subject matter

This impact analysis examines CTI start-up coaching and the other instruments of CTI start-up promotion with their relevant offerings, services and impacts, as well as the interplay between these different promotional instruments. The report also looks at the interfaces with the CTI's R&D Project Funding and the CTI Entrepreneurship Programme, as well as the integration of CTI Start-up promotion in the regional and national funding landscape more broadly. This impact analysis covers the period 2005-2015, in other words it analyses start-ups that applied to participate in CTI Coaching between the beginning of 2005 and the end of 2015.

Purpose and objectives of the impact analysis

The impact analysis on start-up promotion has three objectives:

Objective	Content
1st objective	Assess the concept, implementation and impact of CTI Start-up Coaching, including the internationalisation camps, as one of the CTI's main start-up promotion instruments.
2nd objective	Evaluate the impact of the other instruments from the perspective of start-ups receiving funding from the CTI. These include the news platform, cooperation with partners and CTI Invest.
3rd objective	Carry out an international comparison of start-up promotion – a comparison with three other countries

Table A: Objectives of the impact analysis on CTI start-up promotion

Impact model and questions

An impact model was developed as a basis on which to formulate questions on the three objectives of the impact analysis.

Questions on CTI Coaching (Goal 1)		
Concept	1.A	How would we assess the concept of CTI Coaching?
Implementation	1.B	How well is it implemented (in particular regarding the selection of coaches and the range of coaching services on offer)?
Output	1.C	Which coaching services have been/are used by which start-ups (in particular with regard to awareness, satisfaction, relevance to needs, efficiency, cost-benefit ratio)?
Outcome	1.D	What are the effects of CTI Coaching? To what extent does CTI Coaching achieve effects that could not be achieved otherwise? To what extent can unintended consequences be identified (in particular market impact, economic success including sales, value creation, employment, including consideration of mergers and acquisitions, 'value' of the Label)?
Optimisation	1.E	To what extent is there a need for optimisation regarding the CTI Coaching programme?
Questions on other promotional instruments (Goal 2) including general overview of CTI's start-up promotion		
Concept	2.A	How would we assess the concept of the other promotional instruments in the field of start-ups (in particular conceptual coordination of CTI instruments, integration in the Swiss start-up ecosystem, including NIS and RIS)?
Implementation	2.B	How well are they implemented (in particular tender and selection procedure, coordination)?
Output	2.C	Which promotional instruments are used by which target groups (in particular contribution to the development of the start-up ecosystem, relevance to needs, complementarity with CTI Coaching)?
Outcome	2.D	Which are the effects of the additional promotional instruments? To what extent do these additional promotional instruments achieve effects that could not be achieved otherwise?
Optimisation	2.E	To what extent is there a need for optimisation regarding the additional promotional instruments and CTI start-up promotion as a whole?
Questions on the international comparison (Goal 3)		
Concept	3.A	How would we assess the concept of CTI start-up promotion compared with government support in other selected countries?
Implementation	3.B	There is no international comparison at implementation level as the necessary information is not publicly available.
Output	3.C /	How effective is CTI start-up promotion compared with government support in other selected countries?
Outcome	3.D	

Table B: Questions for the impact analysis on CTI start-up promotion

Study design – methodology

Innovation processes are complex due to a range of different factors that affect the success of science-based start-ups, as well as a multitude of funding instruments from various players, which may be used sequentially or in parallel by start-up founders. It is therefore difficult to explicitly correlate the impacts observed with individual funding programmes. In order to counteract this attribution problem as effectively as possible, on the basis of past research (Hotz-Hart/Rohner 2013, Barjak et al. 2013), as well as own experience, a phased, multi-perspective, multi-method study design was used, including control group comparison with econometric analysis.

The study design comprises quantitative analysis of process data regularly collected by the CTI, a quantitative analysis of the online survey of start-ups, as well as qualitative elements, including a document analysis, exploratory interviews, a survey of selected coaches and selected key actors. The international comparison of CTI funding instruments includes Sweden, Finland and the Netherlands, in other words small, open, technology-intensive economies.

The online survey of CTI start-ups and start-ups from an external control group is the core element of this impact analysis. An overall comparison of the CTI start-ups with the start-ups from the external control group highlights a number of differences, which were important to bear in mind in the descriptive comparisons and the econometric analysis of the impact of CTI coaching. For example, the CTI start-ups include significantly more start-ups in the fields of biotechnology/pharma and medtech/diagnostics, as well as more spin-offs, i.e. start-ups founded by members of universities. In addition, the CTI start-ups were characterised by a significantly greater need for venture capital on average than the control group. We would also point out that the control group is heterogeneous as regards its coaching needs: on the one hand it comprises start-ups that claim they do not require coaching (approx. 30%), and those that have used coaching services (approx. 65%). But of the CTI start-ups, too, almost half used coaching services outside of the CTI. In this case, the use of other coaching and/or funding programmes was included as a control variable in the econometric analysis.

The results were collated in the overall evaluation using methodological triangulation, weighted and assessed taking into account the environment.

CTI start-up promotion (description)

CTI Coaching

CTI Coaching is the main instrument for the promotion of science-based start-ups and comprises individual support and advice for entrepreneurs from one or more coaches with the involvement of other experts. The coaching process is divided into four phases. At the end of phase 2, a decision is made as to whether a start-up is accepted on the CTI Coaching programme (coaching acceptance).

CTI start-up coaching	
Phase/ transfers	Description
Coaching acceptance (CA)	A decision is made regarding acceptance onto Phase 3 in a coaching acceptance meeting.
Phase 3	<p>Professional coaching: The start-ups receive individual coaching and business development support. They are also prepared for the CTI Start-up Label meeting.</p> <p><i>CTI's activities to support start-ups:</i></p> <ul style="list-style-type: none"> – Individual support with development of the business strategy and (refinement) of the business plan, support with IP, finance, team composition – Opportunity to present to CTI Invest until 2015 – Internationalisation camps (since 2011/2013/2015): market validation camp and market entry camp: San Francisco, Boston, New York, London, Bangalore, Shanghai – Support module (workshops) on the following subject areas: IP, patent search, financial planning, legal issues, regulatory affairs, clinical strategy, sales accelerator, pricing, pitch training

CTI start-up coaching	
Phase/ transfers	Description
Awarding of Label	In the Label meeting the start-up delivers a presentation to the CTI Start-up Label Certification Board (made up of half committee members and half external experts; the responsible coach and head coach and a representative of the Secretariat also attend) and applies for the CTI Start-up Label.
Phase 4	<p>Post-Label support (since 2011): If necessary, further support for specific challenges once the Label has been awarded</p> <p><i>CTI's activities to support start-ups:</i></p> <ul style="list-style-type: none"> – Opportunity to present to CTI Invest until 2015 – Internationalisation camp: market entry camp (since 2011, up to 3 years after being awarded the Label) – Expert support project (ESP) (2011-2014; 2014-2016 expiring in accordance with transition provisions): coaching services (up to CHF 15,000) and project funding according to following criteria: particular opportunity for project or particular risk facing project. No content specifications. Project up to a maximum of CHF 30,000 with own financial contribution of 50%, i.e. CTI contribution of CHF 15,000).

Table C: The two main phases of CTI start-up coaching

In accordance with the law, the CTI promotes science-based start-ups (Art. 18 and Art. 20 of the Research and Innovation Promotion Act, RIPA) and focuses on those with high market and revenue potential, i.e. 'high-potential start-ups'. However, the start-ups funded by the CTI are not a homogeneous group. In particular, the differences on account of the various CTI sectors, i.e. between information and communications technology (ICT) on the one hand, and biotechnology and pharma, medtech and diagnostics on the other, are significant. The start-ups in these sectors have very different requirements regarding financing, access to markets and time to develop marketable products. Furthermore, the CTI does not only accept university graduates on coaching programmes, but also serial entrepreneurs.

Of the start-ups accepted on CTI Coaching between 2005 and 2015, the sector split can be characterised as follows: at 37%, the ICT sector was already the largest sector among CTI start-ups in 2005, and reached 44% in 2014. In second and third place were biotechnology/pharma and medtech/diagnostics, making up 20% and 15% respectively in 2015. Start-ups from the fields of engineering, microtechnology and nanotechnology and energy/green tech combined made up 20-30%. The remaining 5% were made up of start-ups in other sectors or interdisciplinary business ideas.

Between 2005 and 2015, 734 start-ups received coaching acceptance, of which 242 were awarded the CTI Start-up Label by the end of 2015.

Other funding instruments

The other funding instruments for start-up promotion can be described as follows:

- *Acceleration*: subsidies for incubators, technology parks or similar that play an active role as exchange or networking platforms between research and industry.
- *Development and networking platforms*: subsidies for the organisers of exchange platforms between research institutions, funding bodies, investors and industry partners.
- *News platform*: improving information for potential technology and science-based start-ups and for entrepreneurs in the start-up sector, and thereby plugging the gaps in conventional media.
- *Business angels platforms*: increasing business angel investments in technology and science-based start-ups and promoting knowledge-sharing and networks between start-ups and business angels.
- *Funding platforms*: helping start-ups raise capital by giving them the opportunity to present to selected investors (matchmaking).

Positioning of CTI Start-up promotion in the Swiss ecosystem

As a background to the assessment of CTI Coaching and the other funding instruments, CTI's start-up promotion needs to be positioned within the Swiss start-up ecosystem. It is unanimously agreed that the Swiss start-up ecosystem has seen strong growth in recent years. For a current overview, please see *The 2015/2016 Swiss Entrepreneurial Ecosystem Report* (Swiss Start-up Monitor Foundation, 2016) and the 2016 edition of GRÜNDEN (GRÜNDEN 2016).

Besides the CTI, there is a wealth of regional, cantonal and local providers of support for start-ups, both public and private. The two Swiss Federal Institutes of Technology, the cantonal universities and increasingly also the universities of applied sciences play an active role here. The regional, cantonal and in some cases local public services/offices offer points of contact, business incubators and technology parks, as well as traditional advice and coaching, and help with securing funding. They also promote start-ups by providing infrastructure, such as premises (from offices to fully-equipped laboratories), favourable tax conditions and in some cases direct financial support. The cantonal activities sometimes complement the CTI's offering, but there is also a great deal of overlap.

An increasing number of private initiatives have emerged and/or gained a foothold in Switzerland in recent years. These include prizes, competitions and start-up support with primarily non-commercial aims that are supported by foundations and large corporations. In addition, there are private companies that offer a broad range of support for a fee. Start-ups often use a combination of offerings; for example, almost half of CTI start-ups also make use of regional and/or private programmes in addition to CTI Coaching.

Another important element is the active risk capital market (venture capital, private equity, money in exchange for participations) that has developed in Switzerland and is currently seeing strong growth. According to the 2016 Swiss Venture Capital Report, the amount of

venture capital invested in Swiss start-ups doubled between 2012 and 2015, to CHF 676 million. The number of rounds of financing also doubled in the same period (SVCR, 2016). Investors (business angels, family offices, venture capitalists, venture capital firms, banks and large corporations) not only provide money, they also bring their experience and know-how in developing start-ups to the table (*smart money*). Crowdfunding has also established itself as a new funding instrument.

There is currently something of a start-up craze, with entrepreneurs being seen as trendy and stories about them featuring in all media. Switzerland is therefore part of an international trend and is in competition with other countries and locations that are also trying to attract start-ups and investors from abroad. At federal level, the CTI and SERI are no longer the only players involved in innovation promotion, as the New Regional Policy (NRP) and active promotion of regional innovation systems (RIS) means SECO is now involved too (cf. the dispatch on location promotion 2016-2019, Federal Council, 2015). In this active and dynamic environment with a whole host of actors and offerings, there is a lack of overview and national coordination. So, for example, some regions still have few offerings, whereas others (Zurich and the Lake Geneva region) have a great many.

Results – overall assessment

Implementation of CTI start-up promotion

In summary, implementation of CTI Coaching by the CTI Commission and Secretariat can be judged effective. Over the study period 2005-2015, there has been clear development and ongoing optimisation, although there are still some points that could be optimised and clarified. An important and necessary development concerns the pool of coaches, which, after being expanded for many years, was selectively renewed from 2012 onwards on the basis of evaluations by start-ups, and was further expanded. This process is still ongoing.

Despite some isolated criticism, the selection procedure (coaching acceptance and awarding of Label) is rated positively for the most part. The intensity of communication and exchange between start-ups and coaches varies depending on the development phase of the start-up and was found to be appropriate. Implementation of the other funding instruments can be described as functional, the CTI Secretariat has descriptions on the aim and award criteria and the CTI Secretariat manages coordination.

Reaching the target groups

Under Art. 20 para 2 RIPA, the Confederation may support the setting-up and development of science-based businesses. To gauge how successfully CTI Coaching implements this legal provision, an assessment is needed of how well the CTI reaches the target group of science-based start-ups and to what extent there is a need for coaching. For this purpose, the degree to which start-ups that receive coaching meet the CTI acceptance criteria is reviewed below:

Acceptance criteria	Fulfilment of the criteria by start-ups
Science-based innovation – Innovation is difficult to copy (e.g. protected by patents)	<ul style="list-style-type: none"> – <i>Sector</i>: The CTI sectors are science-oriented, but it is difficult to assess 'science-based' for the ICT sector. – <i>Higher education cooperation</i>: frequent, indicates proximity to research – <i>Patents</i>: many patents, indicates (science-based) innovation – <i>Proportion of university spin-offs</i>: high, indicates proximity to research – <i>High financial requirements</i>: indicates science-based, research-intensive innovation – <i>Image with regard to universities</i>: CTI Coaching has the image of being focused on universities, also due to entrepreneur courses held at universities.
Team requirements – Entrepreneurial spirit, dedication and individual willingness to take risks – Openness to coaching – Min. 2 competent individuals	Considered ' <i>soft criteria</i> ' by the CTI: – Reviewed by the CTI – Criterion on minimum of 2 people: around 10% of start-ups do not meet this criterion at the start of coaching.
Market potential – >CHF 50 million	According to the self-assessment of CTI start-ups (online survey), the following percentages of the various CTI start-up cohorts meet this requirement: – 2013-2015: approx. 35%-40% – 2010-2013: approx. 35%-40% – 2005-2009: approx. 15%
Revenue potential – Revenue potential >CHF 5 million revenue after 5 years	According to the self-assessment, the following percentages of the various cohorts meet this requirement: – 2013-2015: approx. 60% – 2010-2013: approx. 50% – 2005-2009: approx. 25%
Value proposition – Unique selling point (USP)	This is reviewed by the CTI in the process for granting coaching acceptance.
Readiness of the innovation	This is reviewed by the CTI in the process for granting coaching acceptance.
Financing – Realistic planning/financing of the start-up phase secured – Solid finances	Survival rates of CTI start-ups with coaching acceptance: – 2013-2015: 88%-96% – 2010-2013: 84%-89% – 2005-2009: 66%-74% Survival rates of CTI start-ups with Label: – 2013-2015: 100% – 2010-2013: 91% – 2005-2009: 80% Self-assessment of success in next round of financing: >80% (CTI start-ups are more optimistic on this point than start-ups in the control group.)
Swiss company/status of the firm	<ul style="list-style-type: none"> – Regional distribution: OK on the whole; northwestern Switzerland tends to be underrepresented. – Universities: Spin-offs from ETH Zurich are very well represented in CTI Coaching; spin-offs from EPFL are more likely not to apply to the CTI and

Acceptance criteria	Fulfilment of the criteria by start-ups
	to make use of regional programmes instead. There are only a small number of spin-offs from universities and universities of applied sciences at the CTI.

Table D: Reaching the target group – fulfilment of criteria for coaching acceptance.

On account of the sector mix and the finding that just over half of CTI start-ups are spin-offs from universities and research institutions, we can conclude that the CTI meets the requirement of businesses being ‘science-based’. Furthermore, if we carry out a sector comparison with the control group, we note that start-ups from the biotechnology/pharma and medtech/diagnostics sectors are overrepresented in CTI Coaching. The CTI therefore recruits start-up businesses that are known for requiring more time and risk capital to set up and are therefore likely to have longer-term coaching requirements.

Based on the regional distribution of CTI start-ups and start-ups from the control group, it is clear that the CTI effectively reaches spin-offs from ETH Zurich in particular. Some spin-offs from EPF Lausanne (EPFL) do not participate in CTI Coaching, and instead make use of local and regional funding structures and EPFL offerings. Up to now, northwestern Switzerland has been underrepresented, which can also be attributed to the existence of local funding structures.

The comparison of the CTI criteria for coaching acceptance with the start-ups actually receiving coaching also shows that only a quarter of CTI start-ups meet the criteria regarding market potential and in particular regarding revenue potential, and that these criteria are probably too ambitious. On this point there is a need for clarification – as echoed by coaches and key actors – whether and to what extent the CTI should only promote ‘high-potential start-ups’, or rather what is realistic.

Assessment of the design of CTI Coaching, including 4-phase concept

The design of CTI Coaching can be assessed as follows:

- *Process split into 4 phases, including selection procedure*: the fact that the process is split into phases makes it more transparent and manageable. The question of whether the fourth phase or Label is still necessary in its current form is debatable and is discussed in depth below.
- *Acceptance criteria*: The acceptance criteria regarding market potential and revenue potential in particular are too ambitious.
- *Coaching offer*: On the basis of use and evaluation by start-ups, the broad and modular coaching programme is deemed appropriate on the whole. The financial planning module was particularly popular up until 2015, so it would seem advisable that there continue to be sufficient modules on this topic. The internationalisation camps are held in high regard. Some start-ups criticised the strong focus on business plans and this should therefore be reviewed. While post-Label support (POLS) is valued by the majority of start-ups, the question arises as to whether coaching is still necessary in this phase or whether this is primarily promotion with pronounced deadweight loss.

- *CTI Start-up Label*: The CTI Label in its current form should be viewed with scepticism. While some two-thirds of CTI start-ups consider the CTI Label a seal of quality, only half of them support the statement that the CTI Label represents *readiness* for external funding. A survey on CTI Label start-ups conducted by the CTI in April 2016 (CTI Label Task Force, 2016a) delivered similar, and in some cases, more critical results. Even the coaches and key actors noted a loss of significance and regretted the lack of international awareness of the CTI Label in our interviews. Respondents also added that the Label award presentations have never been successfully turned into attractive events. They felt the real value of CTI Coaching is the coaching itself and not the Label. This attitude is also shared by the business angels, i.e. that coaching acceptance definitely has a certain value but that the Label is awarded too late.
- *Costs and efficiency*: The average costs of CTI Coaching (including 1-2 support modules) amount to around CHF 20,000 per start-up, which, based on around 120 hours of coaching, equates to an average hourly rate of CHF 160. An additional sum of over CHF 3,000 is spent on post-Label support. There are no notable differences between sectors regarding costs and hours, although coaching for biotechnology/pharma and medtech/diagnostics start-ups is spread over a longer period. At 120 hours, the coaching is relatively lengthy. However, there are no good reference values available in this regard and no such values could be collected in the interviews.
- *More flexibility and less red tape*: To ensure the longer-term success of CTI Coaching, the CTI needs to be more entrepreneurial, more flexible and less bureaucratic, partly in order to cater to technological changes and the individual needs of start-ups more effectively, and partly to make optimal use of the diverse expertise available within the network.

In summary, CTI Coaching per se is a solid and comprehensive offering, but there are other good support offerings available with their own plus points. Action is particularly required regarding the CTI Label and strengthening entrepreneurship at the CTI.

Assessment of awareness of CTI Coaching

Awareness of CTI Coaching is not high, even among the start-ups that belong to CTI's target group. For example, a quarter of the start-ups from the external control group claimed they had never previously heard of CTI Coaching. Whether this lack of awareness is due to the fact that the start-ups in question did not look around due to regional, cantonal and local offerings, or else because CTI's communications are insufficient – a criticism levelled by some respondents – cannot be assessed based on the available results.

Assessment of coaches

The expertise of coaches and the way they deal with start-ups was rated positively by 80-90% of CTI start-ups. The CTI coach renewal process and the enhanced quality assurance were also viewed positively. Respondents also welcomed the fact that other experts are also involved in start-up coaching besides the coach.

CTI Coaching – attractive and useful

90% of CTI start-ups that have benefited from CTI Coaching consider the offer to be attractive or somewhat attractive. Almost 80% of CTI start-ups found CTI Coaching to be useful.

Impact of start-up promotion

Start-ups that have received CTI Coaching, in particular those with a CTI Label, have a high survival rate (80%) 6-10 years after they are set up, and on average show constant, albeit in most cases not rapid, growth. Only a small group of roughly 15% of CTI start-ups see strong growth and can be described as 'high-potential start-ups' or 'gazelles'. When the survey was conducted in summer 2016, the median number of full-time equivalents working for the CTI start-ups from the 2005-2009 cohorts was just under 6. If we project this to the 300 start-ups in total that were accepted on CTI Coaching between 2005 and 2009 with an average survival rate of 75%, this results in just under 1,350 jobs. CTI Coaching therefore demonstrates one of the intended impacts, even if the expectation that the majority of start-ups promoted by the CTI should be 'high potential start-ups' is not met.

If we compare the key figures on company success of CTI start-ups with those from the control group, we see that they are similar. While at first glance this may indicate a disappointing result for CTI Coaching, it actually reflects a well-developed funding system for start-ups throughout Switzerland. The various coaching programmes are complementary, but there is also some overlap. Just under half of CTI start-ups therefore use other coaching programmes and just under two-thirds of start-ups from the control group make use of other coaching offerings.

In light of this, and considering that 80% of beneficiaries consider CTI Coaching to be useful, we can assume that the observed effects of CTI Coaching are not primarily deadweight losses. However, these cannot be entirely ruled out.

Impact of CTI Coaching: comparison of CTI start-ups with those from the control group		
Indicator	CTI start-ups	Control group
Survival rate	CTI start-ups with coaching acceptance: – 2005-2009 cohorts: 66%-74% CTI start-ups with Label: – 2005-2009 cohorts: 80%	No data (survival rate after 5 years of all start-ups in Switzerland= just under 60%; ECOPLAN 2016)
Market potential	No significant difference	
Revenue potential	No significant difference	
Market entry*	slower	faster
Export activity	No significant difference (high for both)	
Headcount 2015 (median)	No significant difference – 2005-2009 cohorts: just under 6 FTEs	
Wage bill 2015 (median)	No significant difference – 2005-2009 cohorts: CHF 0.2-0.5 million	
Revenue (median)	No significant difference 2005-2009 cohorts: CHF 1-2 million 2005-2009 cohorts: CHF 0.5-1 million	
Profitability	Difference is barely significant, p=0.011 Lower: 2005-2009 cohorts: 55% Higher: 2005-2009 cohorts: 75%	
Venture capital – Acquired since foundation (median)	Significant difference Greater: 2005-2009 cohorts: CHF 0.5-1 million Smaller.: 2005-2009 cohorts: CHF 50,000-200,000	
R&D spending 2015 (median)	Significant difference between the two groups, but no significant difference when taking sectors into account 2005-2009 cohorts: CHF 0.2-0.5 million 2005-2009 cohorts: CHF 50,000-200,000	
Percentage with university partnership(s)	Significant difference Higher: 2005-2009 cohorts: 75% Lower: 2005-2009 cohorts: 55%	
Cooperation with companies	No significant difference – 2005-2009 cohorts: approx. 33%	
Companies with patents	More: 2005-2009 cohorts: 78%	Fewer: 2005-2009 cohorts: 45%
Prizes	More: 2005-2015: approx. three-quarters	Fewer: 2005-2015: one quarter

Table E: Impact of CTI Coaching: a comparison of CTI start-ups with start-ups from the control group. *It should be noted that no conclusions about future company success can be drawn based on speed of market entry. Source: CTr CTI and online survey 2016.

However, the table also highlights differences between the CTI start-ups and those from the control group. The CTI start-ups are characterised by a greater share of acquired venture capital and a greater need for additional venture capital, more university partnerships and more patents. There is a disproportionately high number of start-ups from the biotechnology/pharma and medtech/diagnostics sectors among the CTI start-ups. Finally, CTI start-ups also win significantly more entrepreneurship prizes.

Evaluation of the other start-up funding instruments

Of the additional funding instruments, the news platform startupticker.ch and the merits of CTI Invest to develop the start-up ecosystem are particularly valued. The CTI subsidies for events and networking (acceleration and developing and networking platforms) and the business angels platforms are not widely known and are primarily rated positively by beneficiaries of the funds. The remaining respondents primarily see the risk of major deadweight loss.

Significance of entrepreneurship courses and R&D projects

The entrepreneurship courses were considered an important element of start-up promotion. Respondents felt it is particularly important within universities to raise awareness among university members, to encourage them to be entrepreneurial, and to teach them the basics about setting up a company. The entrepreneurship courses and CTI Coaching are complementary. So, for example, modules 1 and 2 (Business Ideas and Business Concept) turned out to be an important access channel for CTI Coaching. Furthermore, many start-up founders also attend the advanced modules 3 and 4 (Business Creation and Business Growth).

In recent years, in particular since 2009, the CTI has granted CTI start-ups (once they receive coaching acceptance) increased access to R&D project funding and/or actively got them involved in R&D projects. Since 2009, around 40 new R&D projects have been launched every year, which suggests that almost half of CTI start-ups were involved in an R&D project in recent years, and thanks to CTI funding paid to universities, they were able to benefit from the research and development expertise of universities. Because the amounts involved were significant, around CHF 370,000 on average, it is not surprising that R&D project funding is seen as an important contribution to CTI start-up promotion. Whether and to what extent CTI start-ups get privileged treatment compared to external start-ups is not clear from our data.

Input from the international comparative study

There is no equivalent national coaching programme that corresponds to CTI Coaching in Sweden, Finland or the Netherlands. A comparison of CTI start-up promotion (CTI Coaching and other funding instruments) with the activities in these countries shows that they take a heavily decentralised approach in which diverse bottom-up initiatives are supported and co-funded, with incubators and accelerators playing a key role. In order to further develop CTI start-up promotion, the specific added value of a nationally-organised coaching programme therefore needs to be highlighted. Increased support and/or co-funding of bottom-up initiatives should be reviewed as an option.

Fitness for purpose of CTI start-up promotion

CTI start-up coaching

CTI Coaching now takes place in an extremely active and start-up-friendly environment with many other offerings (regional, cantonal, local, public or private). These offerings are used both by start-ups that do not participate in CTI Coaching and CTI start-ups. Many CTI start-ups and start-ups from the control group become viable businesses but are mostly still small even after 6-10 years. There are, however, a minority of high-potential start-ups or 'gazelles' in both groups.

Our results also suggest that there is a self-selection mechanism at work, in that companies with business ideas that are difficult to implement and/or have lengthy development times

and high financing requirements tend to be interested in and therefore more likely to participate in CTI Coaching.

Against this backdrop, a thorough overhaul of CTI Coaching, including the CTI Label, is needed. In particular, work needs to be done to clarify the target group, to decide to what extent the focus should mainly be on high-potential start-ups and to better coordinate with regional, cantonal and local programmes that are publicly funded. As a national agency, the CTI, or in future Innosuisse, will play an important coordination role, and this will be a legal obligation. The CTI/Innosuisse also needs to improve its international links and positioning, become more dynamic and more entrepreneurial.

The CTI has a comprehensive start-up promotion offering

The range of promotion programmes for start-ups, from entrepreneurship courses to CTI Start-up Coaching and R&D project funding, is valued and used by start-ups.

Additional start-up funding instruments

Besides the startupticker.ch, whose position as a news platform is undisputed, the other instruments should be reviewed.

Recommendations

The CTI launched CTI start-up coaching in 1996 and was therefore clearly one of the first institutions to be active in this area and as such can claim to have provided important impetus for Switzerland's current start-up trend. The CTI still plays an important role in the Swiss start-up ecosystem, in particular as a national agency and for international networking. On the whole, however, CTI's start-up promotion and CTI Coaching in particular, have lost relevance in recent years.

The following recommendations are based on the results of this impact analysis of CTI start-up promotion, the findings from the international comparison and our overall evaluation. They are also guided by the Confederation's legal framework for innovation promotion and the promotion of science-based entrepreneurship, i.e. the Federal Research and Innovation Promotion Act (RIPA)¹ and the Federal Act on the Swiss Innovation Promotion Agency (Innosuisse Act, SIPAA)².

The recommendations are therefore geared towards future start-up promotion by Innosuisse, which will start operations as CTI's successor institution on 1 January 2018.

Recommendation 1 – Greater emphasis on national tasks and coordination: We would advise Innosuisse to place greater emphasis on national tasks in future and to increase coordination within the Swiss start-up ecosystem.

¹ SR 420.1 of 14 December 2012 (Status as of 1 January 2017)

² SR 420.2 of 17 June 2016 (Status as of 1 January 2017)

Justification and explanation: In light of the many regional, cantonal and local support programmes for start-ups from both the public and private sectors, Innosuisse can work closely with the other responsible bodies to better coordinate the various programmes.

Innosuisse should work with the most important regional actors to clarify in which areas Innosuisse can deliver the greatest added value. Clearly there are now many regional and cantonal coaching programmes, which in some cases are complementary, but in some cases offer similar support to that offered by the national innovation promotion agency. This is not about eliminating all cases of duplication per se, but rather clarifying where it makes sense to have multiple offerings, or else filling gaps and learning from each other (best practice). Innosuisse would therefore perform its new coordinator role in accordance with SIPAA while respecting the principle of subsidiarity and avoiding deadweight loss. In this context, Innosuisse could specifically influence the development of the offering by co-funding support programmes for start-ups.

This impact analysis has also shown that national tasks, such as financing a national news platform, supporting major national start-up conferences and helping develop the start-up ecosystem, are held in high regard. Such tasks, which are not assumed by regional, cantonal and/or private funding bodies, should be continued by Innosuisse. This also includes the international networking and positioning of Switzerland in the context of science-based innovation.

Another national task for Innosuisse could be working to secure professional venture funds or ensuring favourable framework conditions (particularly with regard to tax). As noted in the evaluation of CTI Invest, the venture capital available in Switzerland has significantly improved in recent years, so financing the early stages of start-ups is no longer rated as problematic (econcept/AIT 2015). On the other hand, it is still reported to be difficult to obtain the correspondingly large sums of venture capital in the later growth phases. In addition, the evaluation found that there are not enough professional venture funds and venture capitalists in Switzerland.

However, the question of whether it is worthwhile for Innosuisse to support business angel clubs and local events under the heading of national tasks or additional funding instruments is debatable. In the interviews, only the beneficiaries viewed such subsidies positively. The majority of respondents were not even aware of their existence.

In connection with the strengthening of national tasks, it would also be advisable to clarify whether it is the responsibility of Innosuisse to ensure a basic range of promotion programmes throughout Switzerland.

Recommendation 2 – Reposition CTI coaching, including clarifying the target group:

We recommend repositioning CTI Coaching within the Swiss start-up ecosystem. In this regard, the question of the target group also needs to be clarified, including to what extent support should continue to be primarily for 'high-potential' start-ups.

Justification and explanation: This impact analysis shows that CTI start-ups have a high survival rate and employ an average of 6 people (FTEs) after 6-10 years. However, it also provides evidence that comparable start-ups that did not receive CTI support perform similarly well. It also reveals that compared with the control group, CTI start-ups comprise significantly more start-ups in the biotechnology/pharma and medtech/diagnostics sectors, and more spin-offs from universities (in particular ETH Zurich and ETH Lausanne). In addition, CTI start-ups have a greater need for venture capital than the control group on average.

In light of this, a complete overhaul and repositioning of CTI Coaching would be advisable. This also includes clarifying the target group of CTI Coaching:

- *Focusing on strengths – clarifying and restricting the target group:* Who is CTI Coaching particularly suitable for? Or rather, for whom are there no similar offers available elsewhere? Are they primarily university graduates with little start-up know-how, sectors with lengthy development times, high venture capital demands and research-intensive business ideas? This will allow better differentiation of cantonal and regional offers.
- *More realistic support criteria:* According to current support criteria, the CTI focuses its start-up promotion on 'high-potential' start-ups. This is linked to the expectation that coached start-ups have a turnover of CHF 5 million after five years. However, this impact analysis has shown that only 10-15% meet this requirement. For this reason it would be appropriate to adapt the support criteria to reflect the reality.
- *Individual and ad hoc coaching:* Instead of the current comprehensive A-Z support, a switch could be made to more ad hoc coaching at the different start-up development phases. The new legal regulation which will allow start-ups to select their own coach or coaches is a good basis for this. In this way, start-up founders could structure their coaching according to their individual needs. As a result, the cost structures should be reviewed and the scope of a 'basic coaching' reduced. Additional services would have to be approved by Innosuisse.
- *Dispense with Label and enhance coaching acceptance:* The CTI Start-up Label can be dispensed with and in its place CTI coaching acceptance should be better marketed. Start-ups, coaches and key actors unanimously agree that the Label has lost relevance and does not make it easier to find investors, as proclaimed. It is much more important to start-ups to be accepted onto CTI Coaching. From the interviews in particular, it was clear that a 'government label' is not necessarily seen as attractive in the entrepreneurship and investor community. In this regard it can be argued that Innosuisse itself should be more entrepreneurial in order to shake off its image of a bureaucratic institution within the community.
- *Greater support for internationalisation of start-ups:* Exporting goods or more specifically selling abroad is important for the large majority of start-ups. Particularly for markets outside the EU, this is difficult and in some cases requires entrepreneurs to spend time in the respective country. The internationalisation camps, introduced between

2011 and 2015 and which the CTI developed in collaboration with the swissnex network and is now implementing, offer the opportunity to do just that. The camps are held in very high regard by start-ups. As they are not offered by regional funding bodies, Innosuisse should continue to run the internationalisation camps.

Recommendation 3 – Clarify the interfaces with R&D project funding: The fact that CTI start-ups also have access to R&D project funding seems to make sense in principle. However, we recommend creating a separate R&D project funding sub-category for CTI start-ups.

Justification and explanation: The R&D projects are the main support programme of the CTI/Innosuisse, accounting for 70% of the budget. As such, there are specific support and quality criteria that must be complied with. We consider it sensible to clarify CTI start-ups' access to R&D project funding, for example with a separate sub-category to avoid Innosuisse being accused of bias towards its 'own start-ups'.