Supporting policy learning by means of an evaluation synthesis: findings from a study on Swiss innovation policies

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Set up of the study

- Contract work for the Swiss Federal Office of Further Education and Technology OPET (since January 2013 State Secretariat for Education, Research and Innovation SERI)
- Two parallel studies issued
- Comparison and discussion of results with OPET and CTI

Methodological approach

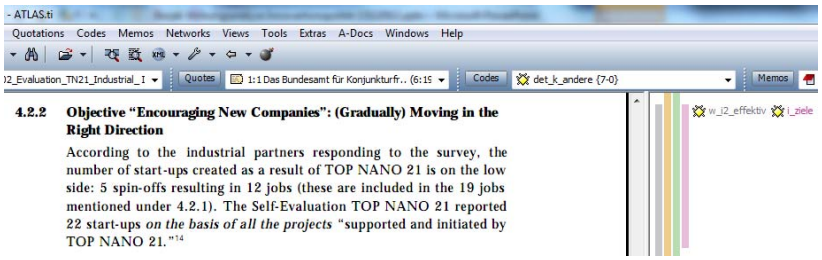
1. Development of a list of criteria for a meta-evaluation and evaluation synthesis drawing on academic literature

10 features of the evaluations

3 features of the innovation support measures

5 aspects of the effects

2. Grouping of documents by evaluation and coding in Atlas.ti



3. Assessment of the evaluations and innovation policies according to the included criteria

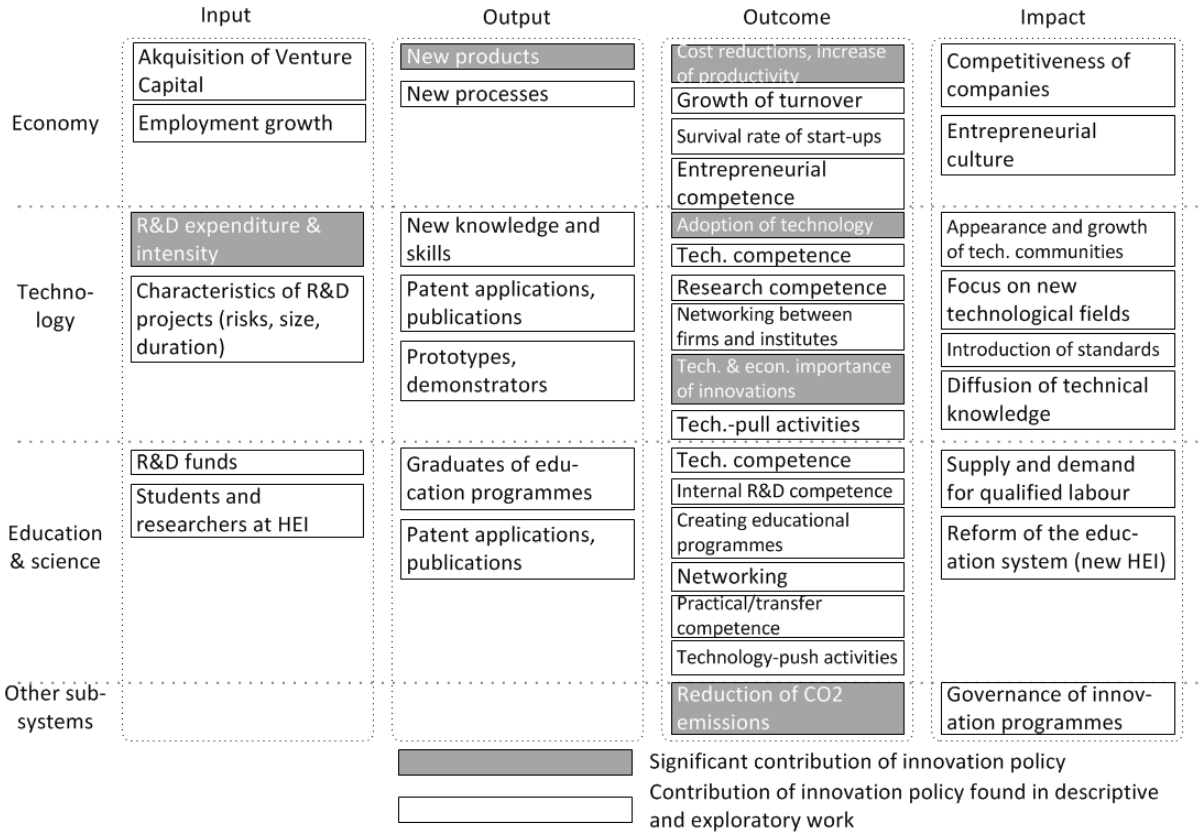
- Evaluation approach?
- How frequent are certain aspects of the evaluation and support measure?
- Rating of the evaluation and support measure on a scale from ++ very positive to - - very negative

Consistency, implementation and effectiveness of the measures

		1. Consistency			2. Implementation		3. Effect-iveness
		a) Problem adecuacy	b) Implementation rules	c) Coherence w. other measures	a) … of the intervention	b) … of the projects	
1.	CIM FH-isi	++	+			++	+
2.	CIM KOF	++	+				+
3.	Microswiss	0			(0)	(-)	+
4.	Evaluation SNF/KTI	++	++	++	+		++
5.	Soft[net]				- -		
6.	TOP NANO 21	0	-	0	++	++	0
7.	CTI support						
8.	Medtech-Initiative	(++)	(++)		+		+
9.	Dissertation on CTI				++		
10.	Applied R&D at FH	0	- -	0	0		+
11.	Concept evaluation KTT	++	-	(++)	+		+
12.	Start-up Label 2006/07						++
13.	Venturelab	++	+	++		++	++
14.	KTT initiative	++	-		- -	-	0
15.	Start-up Label 2011						
16.	Diffusion EET						++

Legend: ++ „very positive", + „positive", 0 „neutral", - „negative", - - „very negative", empty „no rating", (…) few statements, rating questionable.

Effects of the measures



Surprising results

- Evaluations frequently did not discuss the goals of innovation support measures and undertook little effort to measure goal attainment and effects.
- Few sophisticated quantitative evaluations (3 out of 16) and seemingly no good data basis from project monitoring.
- Considerable leverage of CTI innovation support of 2.2-2.8 on the input side (with one exception, TOP NANO 21, with 1.5)
- Mandatory (financial) contribution of companies is considered as a a barrier in only study:
  "A problem for small companies is the general CTI funding scheme, since most of them cannot finance 50 percent of the project, be it in kind, in cash or labor. Matching the funding and keeping their business running is a high burden on exactly those companies that have the highest potential. The relaxation of the general CTI funding rules in TOP NANO 21 has been very helpful. In addition, the ETH scheme of partially supporting students engaged in start-up activities has been rated positively." (ETH Board & Commission for Technology and Innovation (CTI), 2005, S. 15)

Recommendations with regard to innovation policy

1. No fundamental changes of support measures.
   - Generally adequate and consistent,
   - Efficiently implemented,
   - Effective and
   - With positive impact on technical progress
   - However: Beware of ambitious economic goals
2. Communication during and after the support should be extended
   - «Culture of support» constitutes a mental barrier against new approaches among companies and academic institutions
   - Reaching out to «support-resistant» SMEs
   - Better co-ordination of organisations created in and for support measures

Recommendations with regard to evaluations

1. Continuous identification of technological effects and effects on education and science, development of an indicator system
   - Operationalisation and measurement of support results
   - However: Balance and careful selection to avoid counter-productive incentives and a (too) broad conception of success
2. More frequent quantitative ex-post/interim evaluations with sophisticated statistical methods in order to better quantify support effects
   - Professional data collection before, during and after the intervention
   - (Legal) obligation to use implementation data in evaluations
3. Greater sophistication of evaluations requires more resources for evaluations

Ergänzende Folien

Previous evaluations of Swiss innovation policy

1. OECD (2006)/ETH-KOF (2005) of 11 measures
   - Mitnahmeeffekte eher in grösseren Unternehmen als in KMU,
   - „weiche“ Massnahmen wie Training und Beratung sind sehr effektiv,
   - Programme werden i.d.R. gut angenommen,
   - internationale Programme fördern die Netzwerkbildung,
   - einige Programme zur Finanzierung angewandter FuE zeitigen gute wissenschaftliche Ergebnisse
2. Good (2005): 14 Arbeiten zur KTI-Förderung
   - Marktwirkungen, organisatorische Wirkungen und naturwissenschaftlich-technische Wirkungen oder Lerneffekte werden ermittelt,
   - KTI-Förderung besitzt grosse Ausbildungseffekte
   - Förderung dürfte Wettbewerbsfähigkeit der Schweizer Wirtschaft steigern
   - Mitnahmeeffekte wurden nicht gemessen.
   - Erfolgsfaktoren: gute Zusammenarbeit, Interesse und Engagement auf Seiten des Industriepartners und eine sorgfältige Projektplanung und –leitung
3. Hotz-Hart et al. (2006) resümierten drei Arbeiten
   - Beitrag zur Vernetzung und Lerneffekte bei den Unternehmen,
   - Steigerung der Innovationsfähigkeit
   - Projekte sind grösser und werden schneller durchgeführt
   - positive Auswirkungen auf Wissenschaft und tertiäre Bildung

Studies included

Measure	Study
CIM-Aktionsprogramm FH-isi	Dreher, C., & Balthasar, A. (1997). Evaluierung des Schweizer CIM-Aktionsprogramms 1990 bis 1996. Karlsruhe: Fraunhofer-Institut für Systemtechnik und Innovationsforschung.
CIM-Aktionsprogramm KOF	Arvanitis, S., Donzé, L., & Hollenstein, H. (2005). Evaluierung der CIM-Förderung in der Schweiz und Vergleich mit Österreich. In W. Polt & W. Pointner (Eds.), Diffusionsorientierte Technologiepolitik. Eine vergleichende Wirkungsanalyse für Österreich, die Schweiz, Deutschland und die USA. Schriftenreihe des Institutes für Technologie- und Regionalpolitik der Joanneum Research, Vol. 5 (S. 109-126). Graz: Leykam.
Microswiss	Bundesamt für Berufsbildung und Technologie BBT (Ed.). (2001). MICROSWISS: Begleitfoschung und Evaluation des Aktionsprogramms Mikroelektronik. Chur & Zürich: Verlag Rüegger.
Evaluation SNF/KTI	Grunt, M., Reuter, A., & Heinzelmann, E. (2003). Evaluation der Kommission für Technologie und Innovation. Bericht "Selbstevaluation" . Bern: Bundesamt für Berufsbildung und Technologie (BBT). Schweizerischer Wissenschafts- und Technologierat. (2002). Evaluation des Schweizerischen Nationalfonds (SNF) und der Kommission für Technologie und Innovation (KTI). Bericht des Schweizerischen Wissenschafts- und Technologierates an den Bundesrat. The Commission for Technology and Innovation (CTI) of the Swiss Federal Office for Professional Education and Technology. Report of the external evaluation group. Assessment and Outlook Site Visit 18 – 20 February 2002. (2002).
Soft[net]	Bundesamt für Berufsbildung und Technologie BBT. (2004). Förderprogramm soft[net] Schlussbericht. Bern: Bundesamt für Berufsbildung und Technologie BBT.
TOP NANO 21	Balthasar, A., & Lehmann, L. (2005). TOP NANO 21 Industrial Impact Analysis. INTERFACE Institut für Politikstudien. Bierhals, R., Ebersberger, B., & Edler, J. (2005). TOP NANO 21 Interview Report. Frauenhofer Institute Systems and Innovation Research ISI. ETH Board, & Commission for Technology and Innovation (CTI). (2005). Peer Review of TOP NANO 21, February 27 - March 2, 2005. Report of the Peers.
KTI-Projektförderung	Arvanitis, S., Donzé, L., & Sydow, N. (2005). Wirksamkeit der Projektförderung der Kommission für Technologie und Innovation (KTI): Analyse auf der Basis verschiedener "Matched-pairs"-Methoden. ETH, Eidgenössische Technische Hochschule Zürich, Konjunkturforschungsstelle KOF. Arvanitis, S., Donzé, L., & Sydow, N. (2010). Impact of Swiss technology policy on firm innovation performance: an evaluation based on a matching approach. Science and Public Policy, 37(1), 63-78.

Studies included

Massnahme	Studien
Medtech-Initiative	Sturn, D., Bührlen, B., Polt, W., Schmidmayer, J., Steyer, F., Tempelmaier, B., & Zinöcker, K. (2005). Evaluierung der KTI/CTI Initiative MEDTECH 1998 – 2003, Endbericht. Wien & Karlsruhe.
Dissertation zur KTI	Good, B. (2005). Technologie zwischen Markt und Staat: Die Kommission für Technologie und Innovation und die Wirksamkeit ihrer Förderung. Zürich & Chur: Verlag Rüegger.
Angewandte FuE an FH	Mayer, S., Geyer, A., Sturn, D., & Zellweger, E. (2006). Evaluierung des Kompetenzaufbaus für angewandte FuE an Fachhochschulen durch die KTI/CTI 1998 – 2004, Endbericht. Wien & Genf.
Konzeptevaluierung WTT-Initiative	Polt, W., & Stampfer, M. (2006). Konzeptevaluierung der KTI WTT Initiative, Endbericht.
Start-up Label 2006/07	Fahrni, F., Schulze, A., & Neumüller, K. (2007). Wirkung von KTI Start-up Label Massnahmen von 1998 - 2005. Phase II: Evaluation des effektiven Nutzens der in 2003/04 eingeführten Services & des Returns zum Investment der KTI Start-up Label Aufwendungen. St. Galln: Institut für Technologiemanagement, Universität St.Galln. Fahrni, F., Schulze, A., Neumüller, K., & Henschel, P. (2006). Wirkung von KTI Start-up Label Massnahmen von 1998 - 2005. Phase I: Erfolgsquote der KTI Label Firmen und Evaluation der effektiven Wirkungen des Coachings. Institut für Technologiemanagement, Universität St.Galln. St. Galln. Henschel, P. (2006). Chancen und Grenzen staatlicher Fördermaßnahmen für Jungunternehmen am Beispiel der Coachingmassnahmen der Schweizerischen KTI Start-up Label Initiative. Diplomarbeit. Diplom Wirtschaftsingenieur (FH), Fachhochschule Köln Köln.
Venturelab	Koci, M., Kägi, W., & Hof, S. (2007). Evaluation "KTI-Initiative Entrepreneurship, Education and Training (Programm venturelab)", Schlussbericht. Basel: B,S,S. Volkswirtschaftliche Beratung AG.
WTT-Initiative	Stehnken, T., Bührer, S., Zenker, A., Koschatzky, K., Walker, D., & Balthasar, A. (2010). Externe Evaluation der Initiative "Wissens- und Technologietransfer" der Förderagentur für Innovation KTI (KTI WTT-Initiative). Fraunhofer ISI & Interface.
Start-up Label 2011	Gantenbein, P., Herold, N., & Zaby, S. (2011). Die KTI-Start-up-Förderung für innovative Schweizer Jungunternehmen - Ein empirischer Vergleich gelabelter und nichtgelabelter Unternehmen. Basel.
Diffusion energieeffizienter Technologien (EET)	Ley, M. C. (2012). Assessing the Impact of Support Policies for Energy Efficient Technology in Switzerland. In KOF (Ed.), KOF Working Paper. Zurich: ETH-KOF.

Study designs and context analyses

Study	Study design							Context analysis				
	Cross section	Before-After	Control group	Case study	Peer Review	Internat. comparison	Impact model	Society	Institu-tions	Politics	Economy	Techno-logy
CIM FH-isi	x		x	x					x		x	x
CIM KOF	x		x				x					
Microswiss	x		x	x					x			
Evaluation SNF/KTI				x	x				x	x	x	
Soft[net]				x								
TOP NANO 21	x				x					x		x
CTI support	x		x									
Medtech-Initiative	x		x	x		x	x			x	x	
Dissertation on CTI				x			x		x	x		
Applied R&D at FH	x		x	x					x			
Concept evaluation KTT initiative					x	x			x	x	x	
Start-up Label 2006/07	x	x	x				x					
Venturelab	x	x	x			x		x	x	x	x	
KTT initiative	x		x	x			x		x	x		
Start-up Label 2011	x		x									
Diffusion EET	x		x						x			

Data collection and analysis

Study	Primary Data					Secondary data		Data analysis			Triangualtion of data and methods		
	Survey TG	Survey CG	Inter-views	Work-shops	Other	Docu ments	Data	Des-criptive	Analy-tical	Quali-tative	Sources	Stake-holder	Methods
CIM FH-isi	x		x	x	x	x	x	x		x	x	all	x
CIM KOF	x	x						x	x			partly	
Microswiss	x		x	x		x	x	x		x	x	all	x
Evaluation SNF/KTI			x		x	x	x	x		x		all	x
Soft[net]			x			x	x			x		partly	
TOP NANO 21	x		x	x		x	x	x		x		all	x
CTI support	x	x					x	x	x			partly	
Medtech-Initiative	x	x	x			x		x		x		all	x
Dissertation on CTI			x			x				x	x	partly	
Applied R&D at FH	x	x	x	x		x	x	x		x		all	x
Concept evaluation KTT initiative			x			x				x	x	partly	
Start-up Label 2006/07	x	x	x				x	x		x	x	all	x
Venturelab	x	x	x			x		x		x		all	x
KTT initiative	x	x	x			x	x	x			x	all	x
Start-up Label 2011	x	x					x	x			x	partly	
Diffusion EET	x	x							x			partly	

Criteria for structuring evaluations

Criterion	Possible values
Timing of evaluation	Ex-ante, interim, ex-post, retrospective, accompanying
Evaluation purpose	Formative/summative
Evaluation content	Consistency and coherence Implementation Effectiveness Effects
Study design	Cross section, Before-After, Control group, Case study, Peer Review, internat. comparison, Impact model
Context analysis	Society, Institutions, Politics, Economy, Technology
Level of analysis	Micro, meso, macro level
Data collection	Primary and secondary data, methods of collection
Data analysis	Descriptive analysis Explanatory analysis Qualitative content analysis
Triangulation of data and methods	Data from several sources used Data from all/part of the stakeholders Combination of methods, mixed-methods approach
Evaluation process and results	No/some/comprehensive involvement of stakeholders Internal/external evaluators Evaluation published?

Criteria for describing innovation policies

Criterion	Aspects and possible values
Goals of the policy	-
Target group	Companies R&D institutions intermediary organisations innovation-support services Others
Type of support	Financial (grants, credit, tax incentives) Stimulation of co-operation and/or communication Innovation infrastructure and/or services Qualification of human resources for innovation Discursive measures (evaluations, technology assessment, trend analyses)

Criteria for analysing effects

Criterion	Aspects and possible values	
Evaluation content	Consistency and coherence Implementation Effectiveness	
System	Economy Education and research Politics	Technology Society Environment
Dimension of effects	Output (short-term, TG) Outcome (mid to long-term, TG) Impact (mid to long-term, system-wide)	
Additionality	Input additionality Output additionality Behavioural additionality	
Influences on the intervention success	Structural Relational Procedural Contextual	

Mid and long-term effects of the interventions

Technology-oriented CTI innovation support KTT support Start-up support	Economy				Technoloy				Education and research				
	New products, markets, more sales	New processes, cost reductions	New firms	Employment	Technology adoption	Technological competences	Research competences	Networking across inst.	Technological competences	Internal research competences	Educational offers	Networking across inst.	Practical/KTT competences
CIM-Aktionsprogramm FH-isi						+					+	+	+
CIM-Aktionsprogramm KOF					+	+							
Microswiss	-				+	+			+		+	0	+
Evaluation SNF/KTI											+		
Soft[net]						+		+	+		+	+	
TOP NANO 21	-	+	0	-		+		+	+		0		+
CTI innovation support	+	+					+						
Medtech-Initiative	-	0		+		0	+	+					
Dissertation on CTI	0	0									+		
Applied R&D at FH		0				+	+	+	+	+		+	+
Concept evaluation KTT initiative													
Start-up Label 2006/07	+		+	+		-							
Venturelab			+										
KTT initiative	-	0		-		+	+	+					
Start-up Label 2011			+	+									
Diffusion EET		+			+	+							

Legende: + „posit[illegible]
leer „keine Bewertung“

Additionality of the interventions

	Input additionality	Output additionality	Behavioural additionality
CIM-Aktionsprogramm FH-isi			
CIM-Aktionsprogramm KOF	o		
Microswiss	-		+
Evaluation SNF/KTI	+		
Soft[net]			
TOP NANO 21	+		+
CTI innovation support	+	+	
Medtech-Initiative	+		+
Dissertation on CTI	+	+	+
Applied R&D at FH	-		
Concept evaluation KTT initiative			+
Start-up Label 2006/07			
Venturelab		o	+
KTT initiative			
Start-up Label 2011	+		
Diffusion EET	+	+	

Legend: + „positive“, o „neutral“, - „negative“, empty „no rating“

Financial data for the innovation support measures[a]

	Support period	Volume of public support in SFr.				Volume of projects in SFr.		
		Total (in mill.)	# projects	Per project	p.a. (in mill.)	Total (in mill.)	Per project	Project total/ Support total
CIM-Aktionsprogramm FH-isi	1990-96	102			14.6			
CIM-Aktionsprogramm KOF	1991-96	110			18.3			
Microswiss	1991-96	65.1[b]	318[b]	205‘000[b]	10.9	115.9[c]	464‘000[c]	2.26
Evaluation SNF/KTI	2000-03	320			80			
Soft[net]	1995-2000	370	1‘700	218‘000	61.7	1‘040	612‘000	2.81
TOP NANO 21	2000-03	30	151	199‘000	7.5			
CTI innovation support	2000-03	72	260	277‘000	18	109	419‘000	1.51
Medtech-Initiative	2000-02	120.9	634	191‘000	40.3			
Dissertation on CTI	1998-2003	36	134	269‘000	6	90.7	677‘000	2.52
Applied R&D at FH	1998-2007	215			21.5			
Concept evaluation KTT	1998-2004	141	772	183‘000	20.1	347	449‘500	2.46
Start-up Label 2006/07	1996-2005		153					
Venturelab	2005-10	23.8			4			
KTT initiative	1996-2009		243					
Start-up Label 2011	2008	106			106			

a Data on the basis of the project evaluations; no comparison with other sources or consistency checks. No data in the dissertation on CTI, KTT concept evaluation and for Venturelab. - b Only industry projects. - c Without CTI special credit.