



THE CIRCULATION OF KNOWLEDGE
**BORN TO BE SOLD? START-UPS AS
PRODUCTS AND NEW TERRITORIAL
LIFECYCLES OF INDUSTRIALIZATION**

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Abstract

Territorial innovation models and policy practices traditionally tend to associate the emergence, resurgence and growth of start-ups with the development of local industries, either as industrial pioneers or innovative spin offs embedded in a regional production system. This approach is in line with a 'lifecycle' pattern of innovation and of industrialization marked by sequential waves of growth and decline, by technological renewal and by sectorial transitions. In a knowledge and financial economy characterized by combinatorial knowledge dynamics, by even shorter project-based innovations and by global financial and production networks, this approach is called into question. Through the case of Swiss medical technologies (Medtech), this paper highlights how start-ups' evolution is shaped, from its early phase on, by the corporate venture strategies of multinational companies. While the economic potential of start-ups was traditionally perceived in a longer run, they are more often 'born to be sold' today. New research avenues and policy issues are finally derived from this particular case to address territorial innovation and competitiveness in the future.

Keywords

Entrepreneurship,
Start-ups,
MNEs,
Medical technologies,
Financial resources.

INTRODUCTION

In Schumpeterian ontology, entrepreneurs personalize economic change by their capacity to create and exploit new production or market opportunities. Beyond an individual action, entrepreneurship is also perceived as a collective innovation process embedded in territorialized institutions, actor relations and evolutionary pathways. Widely investigated since the 1980s, the Silicon Valley model has played a large part in carrying out and legitimizing this ontology through idealized visions of it. At the same time, it has become a model of territorial competitiveness advocated by current policy discourses and practices.

Nowadays, the familiar figures of William Hewlett, David Packard, Steve Jobs, Bill Gates, Larry Page or Sergey Brin typify the iconic image of entrepreneurs developing a new idea, prototyping a new product and starting a new business in their 'garage' (Audia and Rider, 2005). Start-ups symbolize contemporary entrepreneurship at the crossroads of science and industry, embedded in regional networks of firms, research and education bodies and capital ventures (Florida and Kenney, 1988). They are regarded as nascent industries forging the resilience of a flexible regional production system exporting innovative and competitive products to distant markets (Saxenian, 1991; Saxenian, 1990).

The aforementioned entrepreneurial projects, the image of 'garage' entrepreneurs and start-ups, reflect a 'life cycle' pattern of innovation and of industrialization marked by sequential waves of growth and decline, by technological renewal and by sectoral transitions. Often associated with the success stories of Hewlett-Packard, Apple, Microsoft or Google, start-ups are commonly viewed as the potential inception of a new industrial trajectory which is expected to grow, create jobs and disseminate innovation locally.

In a knowledge and financial economy characterized by combinatorial knowledge dynamics (Crevoisier and Jeannerat, 2009), by even shorter project-based innovations (Grabher, 2002a) and by global financial and production networks (Coe *et al.*, 2013), this idealized approach of regional innovation and growth is called into question. Through outsourcing and corporate venture strategies, multinational companies step in at an early stage of the enterprises' incubation (Chesbrough, 2002; Garel and Jumel, 2005; Ben Hadj Youssef, 2006). The development of a local start-up is more than ever bound to the decisions of global stakeholders. What kinds of entrepreneurship, ecosystems and evolutionary paths are implied by such interdependencies? How does it impact on theoretical and policy models of regional innovation and territorial competitiveness?

Through the case study of Swiss medical technologies (Medtech), this paper sheds light on three different aspects of this question. Firstly, it is observed that start-ups' trajectories are shaped by the two contrasting territorial dynamics of knowledge and financial anchoring. While fundamental technology and incubation capital builds on local resources, industrial production and market exploitation takes place, from its early phase onwards, through the investments of large listed multinational companies. Secondly, the entrepreneurial plan behind the creation of a new start-up indicates a fundamental change is underway. While the economic potential of start-ups was traditionally viewed as a longer-term prospect, they are now 'born to be sold'. Corporate venture has become a strategic tool for large companies to

tap external innovation processes taking place with the local milieu. Thirdly, the identification and evaluation by investors of potentially lucrative start-ups involves complex intermediation processes. From this point of view, international fairs and opinion leaders are key means of justifying and legitimating the value of local start-ups, purchased as a product.

1. Territorial Innovation: Localized Entrepreneurial Emergence and Industrial Growth

In a post-Fordist era, the term innovation is commonly used to explain the success of particular enterprises, industries and regions facing production cost competition in the globalized economy. Inspired by Schumpeter's approach to economic change, many contemporary theories and policy discourses view innovation as a dialectical interplay of *emergence* and *growth* (Cooke *et al.*, 2011b).

On the one hand, economic change emerges from entrepreneurship. Entrepreneurship is considered the fundamental socio-economic driver through which contingent resources (Bathelt and Glückler, 2005) are turned into new products or production processes through creative destruction, production and recombination (Schumpeter, 1935). Emergence occurs through pioneer entrepreneurs or large incumbent firms breaking away from an existing market offering (e.g. a new product or a new use of an existing product) and/or an established production system (e.g. a new technology or a new supply chain).

On the other hand, in economic change, growth occurs through industrialization. Innovations are not 'isolated events'. They 'tend to cluster, to come about in bunches' (Schumpeter, 1939: 98). Industrialization is here broadly defined as the productive form taken by related entrepreneurial projects and the process by which growth in innovation is achieved in a particular industry. It may be driven by processes of dissemination (e.g. through knowledge trickle-down or competition-cooperation dynamics), concentration (e.g. dedicated competences, workforces and infrastructures) or specialisation (e.g. a specialised supply chain). Through productive, corporate or market growth, industrial development generates new employment and new commercial revenues in relation to a particular innovation cluster.

In past decades, the spatial dynamics of entrepreneurship and emerging innovation have been the subject of various analyses (Trettin and Welter, 2011). Not merely the result of individual efforts, entrepreneurship has been depicted as a collective process embedded in particular relational, institutional and evolutionary configurations situated in time and space (Lambooy, 2005; Ferrary, 2008).

In regional studies, entrepreneurship is usually regarded as the capacity of local actors to foresee and undertake individual and collective projects in a changing environment, based on specific regional resources (e.g. social, cultural or technical capital) (Maillat, 1995). Innovation develops endogenously within local production systems competing beyond regional boundaries (Coffey and Polèse, 1984). More operational approaches have subsequently viewed entrepreneurship as the ability of specific regional innovation systems to turn locally-generated knowledge into successful entrepreneurial projects (Cooke, 2001;

Doloreux, 2002).

Not confined to the question of entrepreneurship, industrialization has also been addressed as a *sine qua non* condition of development within territorial innovation. Not only have regional innovation systems been depicted as spatial contexts of emerging innovation, they are also particular socio-economic arenas enabling entrepreneurial projects to 'take off' and, at the same time, 'anchoring' them through local clusters of activities (Porter, 1998; Cooke and Martin 2006), enhancing knowledge dissemination, flexible specialisation (Simmie, 2005), related innovations (Frenken and Boschma, 2007) or spatial agglomeration (Vatne, 2011). If regional clustering of innovation does not necessarily follow the trajectory of a single industry, its endogenous development bears an industrial dimension following the sequential homogenization phases of activities in particular industrial or thematic fields (Menzel and Fornahl, 2010).

This industrial aspect of clustering has given rise to debated models of territorial competitiveness, highlighting the regional advantage created by a 'Marshallian' specialisation (Moulaert and Sekia, 2003) or by a 'Jacobian' diversification of local innovative activities (Cooke, 2008). Nevertheless, all these models share a common view: understanding territorial competitiveness is not only about pointing out how innovation emerges in a particular spatial context; it is also about addressing how innovation generates new employment and revenue through export-based (basic) and induced (non-basic) activities in this territory (Polèse and Shearmur, 2009).

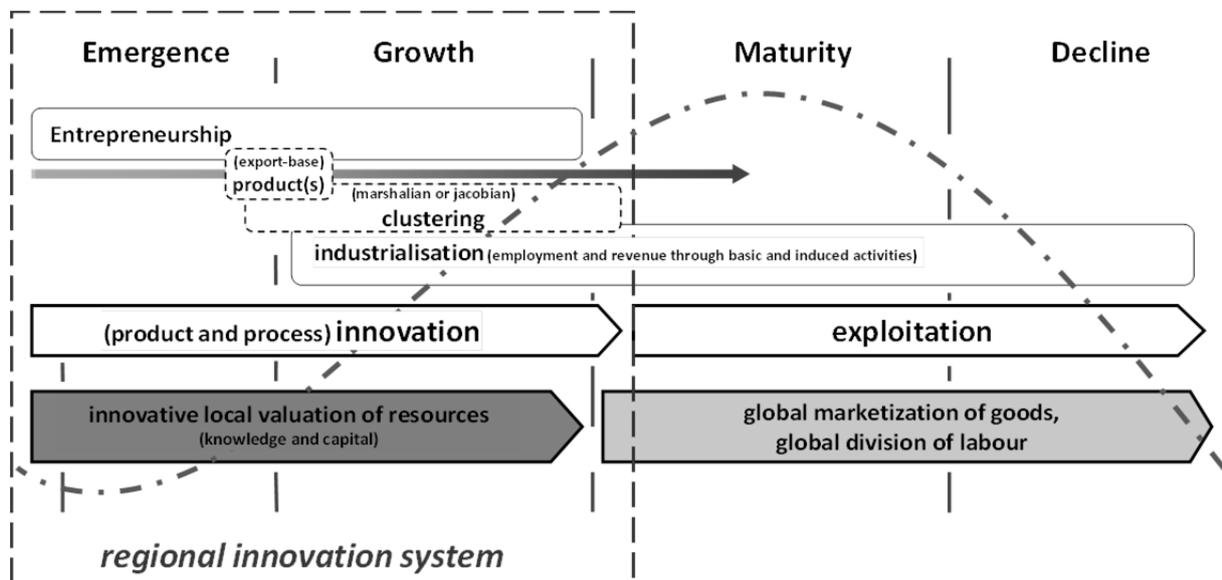
Initially adopted by Marshall (1890), who compared the evolution of businesses in the nineteenth century with the birth, growth, maturity and death of trees in a forest, the 'lifecycle' metaphor has gained common currency in describing the organic nature of economic processes (Penrose, 1952). Used to describe the way in which firms and industries develop within the ecological context of technology, product and market selection, the lifecycle approach posits innovation as sequential waves of emergence, growth, maturity and decline (Vernon, 1966; Markusen, 1985; Klepper, 1997).

Drawing upon a similar metaphor, numerous works have provided various interpretations of territorial competitiveness along with the different stages of development that particular regional production systems may face. In phases of emergence and growth, geographical proximity can provide relational facilities (e.g. informal, multifunctional or specialized networking among regional economic and non-economic actors) and institutional facilities (e.g. routines, policy support) to stimulate new entrepreneurial projects and to overcome market or technological uncertainties related to the creation and industrialization of new market offerings (Potter and Watts 2010). In the maturity phase, standardized technologies, production processes and markets become less dependent on a particular innovation milieu. Relocation of activities is easier and creates a new spatial division of labor in a global market (Vernon, 1966; Tichy, 2011). The stages of maturity and decline are not usually directly related to innovation-driven territorial competitiveness. Innovation may develop incrementally alongside a particular market positioning and sectoral trajectory but competitiveness is primarily achieved through conservative principles (market oligopolies, technical and structural path dependencies) underlying a potential decline in the original production system

through latent lock-in (Grabher, 1993; Boschma and Lambooy, 1999).

From this point of view, territorial innovation models have hitherto primarily focused on regional emergence and growth of innovation (Cooke *et al.*, 2011a). Phases of maturity and decline are usually regarded as inevitable aspects of new potential emergence through innovative diversification, adaptation or reconversion. Regional innovation systems do not necessarily draw upon a single product or sector. They usually build upon subsequent emergences and related industrial lifecycle types (Cooke *et al.*, 2011b). In other words, regional innovation systems are fundamentally depicted as specific territorial contexts of entrepreneurial (re)emergence(s) and industrial growth through a local innovative valuation of resources (Figure 1).

Figure 1: Innovative emergence and growth in regional innovation systems



Source: Author's own work.

2. Standardized Innovation Policies and Cluster Lifecycles

In the last decade, a plethora of policies has been launched to enhance regional innovation and territorial competitiveness. In such initiatives, the example of Silicon Valley has usually been taken as a standard model, while 'technopole' or 'cluster' strategies have commonly been viewed as the most easily implemented best practices (Martin and Sunley, 2003; Tödting and Tripl, 2005; Brenner and Schlump, 2011). On the one hand, these policies seek to stimulate pioneer entrepreneurs and incumbent companies by providing precompetitive funding to R&D projects and start-up ventures. On the other hand, they aim to foster creative knowledge-sharing and dissemination among regional actors in related fields

of activities through proactive networking. Generally speaking, public intervention tends to be viewed ideally as the third component in a triple-helix scenario, whereby it provides 'assistance' for the emergence and growth of 'linear' innovations taking place between science and industry (Etzkowitz, 2006).

Such initiatives tend to share an implicit view of innovation: 'successful start-ups are the nascent industries that will underlie the resilience and growth of a regional production system'; 'supporting today the emergence of local innovation prepares the ground for the industries of tomorrow'; 'new regional employments and revenues will come along with innovations'. This stylised approach to regional innovation and growth policies is nevertheless now being challenged. Drawing upon various seminal critiques addressed by recent debates in regional studies, three prominent fundamental issues emerge.

Firstly, in a complex, knowledge-based society, economic development and competitiveness are increasingly strongly driven by combinatorial knowledge dynamics (Gibbons *et al.*, 1994; Crevoisier and Jeannerat, 2009). Innovation increasingly tends to emerge across different sectoral lifecycles rather than within single trajectories. Accordingly, regional innovation tends to emerge and develop through related varieties taking place across different local clusters and lifecycles (Asheim *et al.*, 2011).

Secondly, in this context of knowledge-intensive innovation, entrepreneurship builds on permanent and shorter-run projects (Grabher, 2002b). Regions are, in this context, complex 'project arenas' (Qvortrup, 2006) or 'adaptive systems' (Martin and Sunley, 2011) of continuous innovative (re)emergence that have to overcome the path-dependent lock-ins inherent in long industrial waves and stable phases of industrial maturity. Furthermore, regional revenue is generated from knowledge-intensive activities, selling tailor-made solutions rather than export-based products.

Finally, territorial innovation processes are embedded in increasingly global production and financialized networks (Coe *et al.*, 2013; Corpataux *et al.*, 2009). In the traditional lifecycle approach to territorial innovation, spatial division of labour were traditionally described as a 'push' movement (Tichy, 2011): the relocation of activities and foreign direct investments are undertaken by mature companies from their home region towards specialised and lower-cost supplying regions. Nowadays, this one-way process is challenged by two fundamental phenomena. On the one hand, global economic financialization has increased the liquidity/mobility of capital, which can be instantly invested in distant and attractive listed businesses (Corpataux *et al.*, 2009). On the other hand, large multinational companies have become global investors in out-sourced innovations through corporate venturing (Chesbrough 2002; Gareil and Jumel, 2005; Ben Hadj Youssef, 2006). In this context, relocations and foreign direct investments tend to occur at an earlier development phase in a 'pull' process, which consists of 'picking up' the competitive winners within global innovation networks.

How do these new challenges actually impact on established models of regional innovation and territorial competitiveness? How should conventional policy and lifecycle approaches be reconsidered in such a context? The next section examines these questions through the

particular case of Medical technologies in western Switzerland.

3. Inside the Case of Medtech Start-ups in Western Switzerland

Considered to be the area of life sciences covering the various economic activities of research, sub-contracting, development and marketing of medical devices and applications (Medtech Switzerland, 2012), Medtech is one of the Swiss economy's flagship industries, generating around \$5bn *per annum* and employing some 40,000 people, i.e. 2% of the country's workforce (Klöpper and Haisch, 2008: 11). The Swiss medical industry currently accounts for a total of 1600 companies¹ subdivided into manufacturers, producer suppliers, distributors and companies specialising in the supply of services to medical device producers (Medtech Switzerland, 2012: 30-31). According to Klöpper and Haisch (2008), changes in the Swiss medical industry have primarily been driven by three factors. Firstly, Medtech companies have benefitted from the Jura region's rich technological and research environment thanks to the existing watch-making industry there, producing various high-quality, high-precision components. Secondly, the high prices on the Swiss domestic market have often meant that there is money available for medical investment and innovation, helping local businesses to be more innovative than their market competitors. Thirdly, research by public laboratories, both basic and applied, has enabled the development of major medical projects within the country. Territorially speaking, most businesses involved in medical work are based in the Zürich and western Switzerland regions. With a long tradition in this field, the latter region has a dense population of medical actors (e.g. state-run hospitals and private clinics), research institutes (e.g. the university institute and private research investment) and the industry's major multinational companies (Klöpper and Haisch, 2008: 12). Over the last ten years it has also seen a growing number of start-ups (Figure 2), taking the current total to 341.

While the term "Medtech" is often used by both public authorities and entrepreneurs to define their business, this term is inherently ambiguous. It can effectively be seen as both a service industry and goods industry, as it represents not only those industries which produce medical devices but also those actors supplying services which are not identifiable with a specific product or technology. Henceforth, despite being implied by the term, "Medtech" cannot be defined as a technology or by a clearly identifiable product type. For this reason, numerous actors in this field prefer to view Medtech activities not as a specific technology or sector but rather as a *market*.

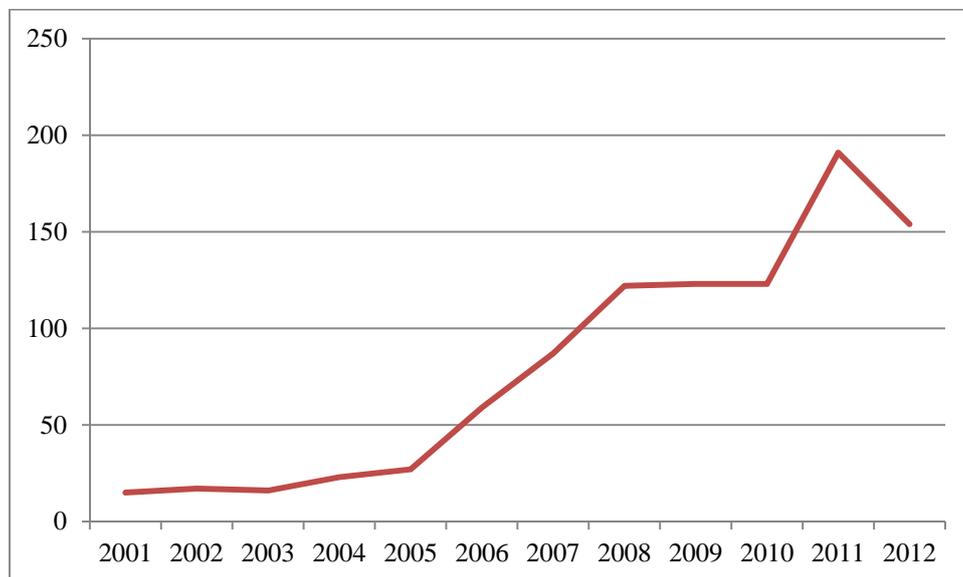
This raises a number of questions: how do we define current Medtech activities? Would it be appropriate to speak of the emergence of a new medical cluster in western Switzerland? How are we to interpret and understand the emergence and development of these activities through the start-ups which have recently sprung up in this region? What critical light might the case of western Switzerland's Medtech industries bring to bear on the life cycle approach to clusters?

These questions were examined in a case study carried out between October 2012 and

¹Data taken from a survey into the Swiss medical technologies industry in 2012.

March 2013 as part of a project financed by the *Fond National Suisse de Recherche*². This study was on the one hand based on an in-depth analysis of medical technology news stories, expert reports and industry journals. On the other hand, it involved conducting 30 semi-directive interviews with SMEs and more specifically with 11 local start-ups and 5 multinationals based in the region. At the same time, two participant observations were carried out at specialist trade events and with a panel of experts. These investigation methods enabled us to better understand the processes at play within local innovative businesses, to comprehend the way in which these businesses have evolved, to uncover the relationships forged between these businesses and the multinationals as well as to gain a better insight into the impact that intermediary actors have on these processes.

Figure 2: Medtech Start-ups Founded in Western Switzerland between 2001 and 2012.



Source: www.startup.ch, as per 12.12.2013.

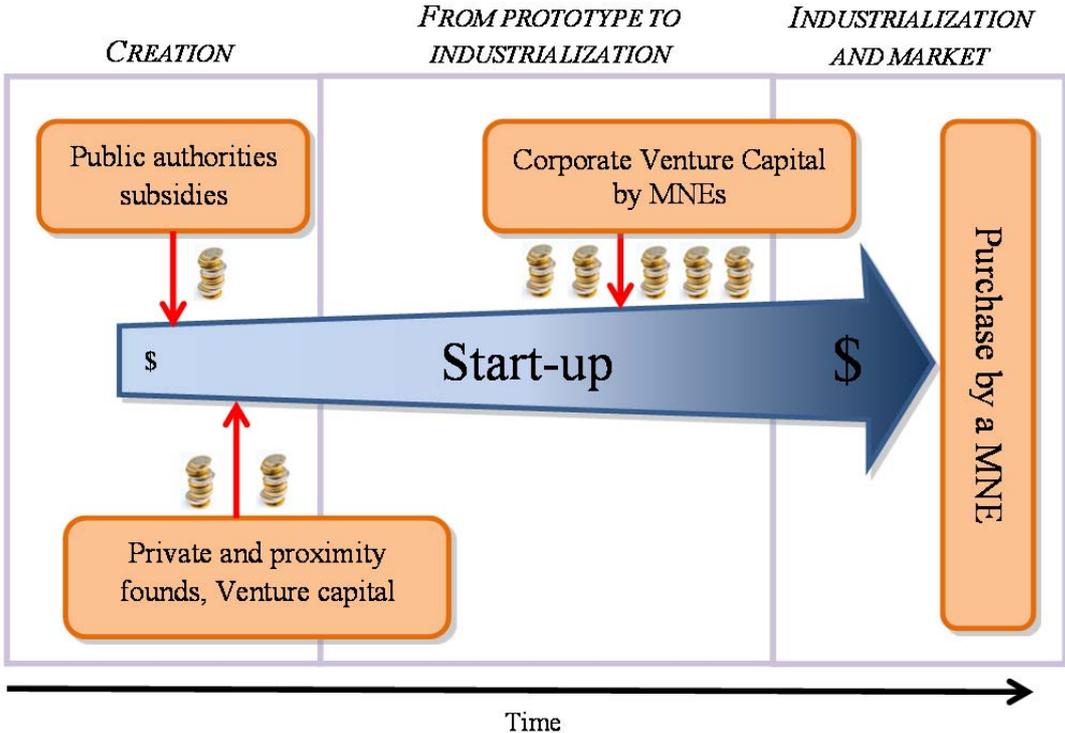
4. From Local Emergence to Multinational Buy-out

Whilst technical skills are straightforward enough to come by through local research institutes, in the case of Medtech in western Switzerland it is clear that start-ups struggle to find the local financial backing required for their research and development needs. They are often initially supported through local finance but, with copious red tape and high production costs, medical start-ups are increasingly dependent upon multi-local financing for research and development. Innovative businesses' development is therefore no longer solely linked to the region's capacity to provide local investment (bank loans, public authority support, etc.) but to their capacity to attract the interest and support of the major groups organised at

² Research by the *Fond National Suisse de Recherche Scientifique* entitled "Cluster Emergence, Renewal and Transition in Switzerland: Evidence from Cleantech, Medtech and the Watch Industry".

global level. This model is overturning the way local innovation systems work, as most start-ups are generally founded by entrepreneurs looking for the business to be sold on the market at a profit. On the basis of our case study, we have identified 3 different phases in the life of a start-up (Figure 3).

FIGURE 3: THE THREE PHASES OF START-UP FINANCING.



Source: Author's Own Work.

Characterised primarily by a general lack of their own resources and by a great deal of uncertainty, the first phase of a medical start-up's life cycle is all about ideation. In an uncertain environment, securing financial capital for innovation sometimes becomes extremely difficult and requires the mobilisation of external resources using alternative network-based strategies. In western Switzerland, the creation of medical start-ups and the design of the first prototypes are modestly financed by government subsidies as well as through local capital (Crevoisier, 1997) often obtained from the entrepreneurs' own social network (e.g. family, friends, contacts). Often the start-up process for innovative businesses involves the financial support of private investors, primarily venture capitalists. Rarely falling within the ambit of the entrepreneur's social network, their financing of development prototypes is done with a view to eventually making a profit. The *Sensimed* company, inventors of a special glaucoma-detection contact lens, is a great example of this kind of local investment. In order to develop the first product prototypes, the necessary financial resources came principally through the business owner's own social network and certain

public financing initiatives aimed at the incubation and start-up of so-called “pre-competitive” projects.

The second phase of the start-up’s life cycle covers the transition from prototype to industrial production. In contrast to the start-up’s initial phase, the phase covering the transition from prototyping to industrial production of products requires much greater sums of money, which are harder to source locally from small or medium-sized investors. The production costs and the cost of the various requisite medical device certifications often necessitate considerable investments, i.e. in the region of 20-30 million Swiss Francs. Only multinationals are able to provide this kind of liquidity for producing and certifying new devices. These investments are very often based on corporate venture capital (Chesbrough, 2002), whereby multinationals take a shareholding in promising companies (Ben Hadj Youssef, 2006). The diabetes treatment device made by a local start-up is a good case in point. During the certification process and first phase of industrial production, this product was supported by an American multinational based in the region which now plays a decision-making role in this innovative company.

The third phase primarily involves the market launch of the medical device and the buy-out of the start-up by a multinational. According to Narula and Santangelo’s thesis (2009), medical multinationals based in the region achieve innovation not only through the skills within their organisation but also through outsourcing and the skills of their external partners, be they research laboratories or businesses. They maintain ongoing relationships, both financial and technological, with local entrepreneurial networks and start-ups in order to benefit from their output and with a view to possibly buying out the start-up, internalising its product, its production and its specialist workforce. The *Médos* company provides an illuminating example: this young business based in western Switzerland, specialising in the development, production and marketing of implantable medical devices and accessories, was bought out by a big American group in 1994 and was incorporated as a new business within the family of this large group.

Looking at these three stages of evolution, we note two main issues. Firstly, start-ups develop through both public and private local capital based on a relationship of trust between actors (Crevoisier, 1997). Unlike the Silicon Valley ideal-type (based on an influx of venture capital enabling the rapid creation of start-ups (Comtesse, 2013: 14) venture capitalists play only a minor role in the setting up of new medical businesses in western Switzerland. Despite their minimal involvement in the creation of start-ups, more substantial investments come in the form of corporate venture capital bestowed by large stock-market-listed companies (Garel and Jumel, 2005). Although these investments support start-ups through the process of certification and the initial manufacturing of products, they also enable the multinational to gain easy access to new technologies, to improve internal research and development through the applications developed by the start-up, to identify new markets and indeed to create a profit (Ben Hadj Youssef, 2006; Chesbrough, 2002).

Secondly, these processes indicate a radical change to the industry’s traditional processes of innovation and development. The typical view of the innovative entrepreneur is that of a person setting up a business with the aim of creating endogenous growth through the sale of

their product (Lebret, 2007). The product is the item to be commoditised and the start-up is the means by which it is invented and put on the market. On the other hand, the case of the medical industry in western Switzerland evidences not only the buyout of start-ups by multinationals but also a desire on the part of entrepreneurs to create a business with the aim of selling it on to a large group within the short to medium term. Although the buyout of start-ups by listed companies is hardly unusual, the commonly-expressed desire of entrepreneurs to sell on their business is a more recent phenomenon. In such cases, the medical product becomes more a means of increasing a company's value in the start-up market. The proliferation over the last ten years of prizes and quality kitemarks being awarded to start-ups rather than to specific products is a good illustration of this turnaround.

5. The Construction of a Start-up Market

Traditionally, start-ups are actors dedicated to creating new products for exploitation on the market which should enable them to develop into SMEs (Lebret, 2007). Our case study shows that start-ups do not concentrate solely on the creation of medical devices to be sold on the market. They also increase their intrinsic market value thanks to the support of intermediary actors (e.g. opinion leaders) and the development of profitable products. On the one hand, this increase in value enables private investors (and particularly the initial venture capitalists) to make a profit at the first stage of the products' sale and at the final stage of the start-up's sale to the large stock-market-listed groups. On the other hand, this increase in value enables the entrepreneur to make more money thanks to the buyout of the start-up by a multinational, which often already has a stake in the company through corporate venture terms (Garel and Jumel, 2005).

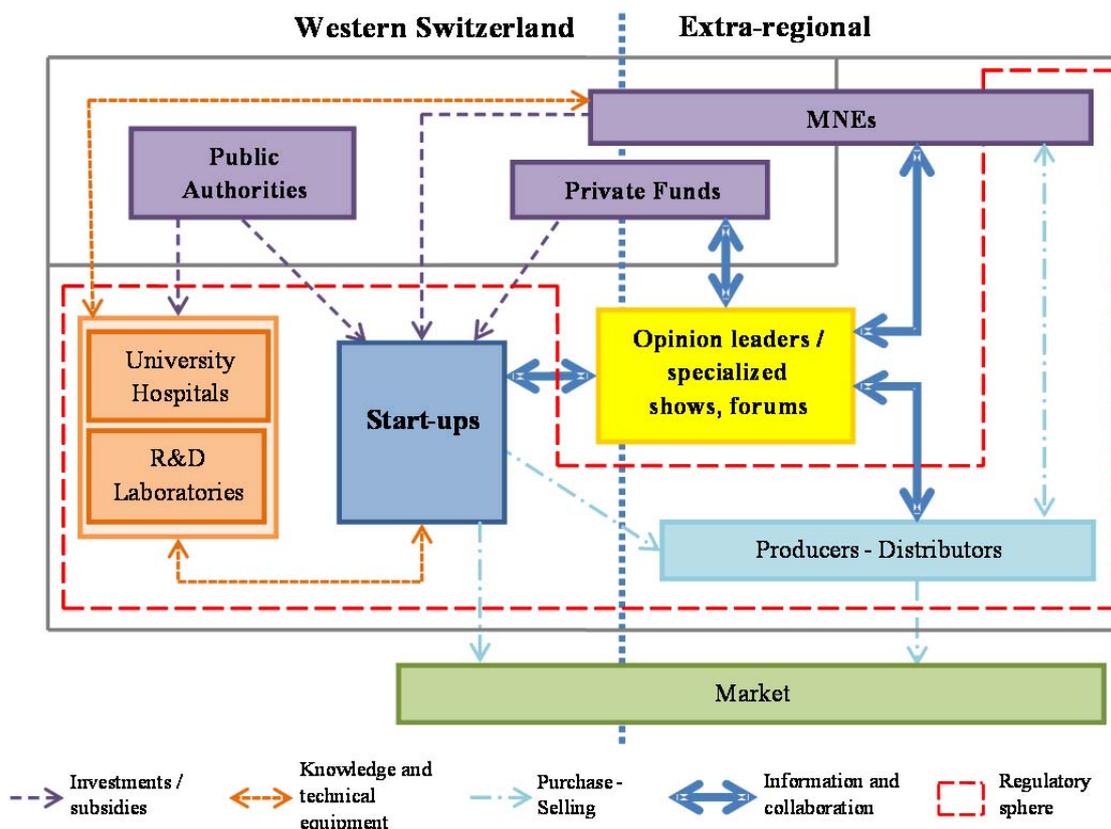
Generally speaking, medical start-ups are being less and less viewed as nascent productive companies and more and more as socio-technical devices designed to be marketed. In other words, the medical product developed by a start-up becomes just one of various identifying features of a marketing concept which is sold in the form of a complex entrepreneurial project.

In a process of perpetual reinvestment, money made on the sale of the start-up is often reinjected into the system by the entrepreneur to set up a new one. *Aleva Neurotherapeutics* is a good example of this phenomenon. Developed by an engineer and set up through a regional business incubator, this start-up is involved in the development of neurostimulation technologies enabling improved therapies for neurological diseases. This innovative business was recently bought out by an American multinational, wanting to apply the concept developed by the start-up to its own products. Consequently, the medical device is no longer just considered a panacea through which to develop the business and to expand to become leaders within their sector; rather, the product is seen as the medium through which the business's image is to be promulgated, to attract investors and ultimately sell the start-up.

In our particular case, the construction of the start-up market in western Switzerland occurs through the intermediation of "legitimizing third parties" whose power is enacted in specific

events and forums. Whilst an entrepreneur’s network of contacts and their friends and family may provide the necessary cognitive and financial resources to get a start-up going (Crevoisier, 1997; Grossetti, 2006), intermediary actors help boost the value and legitimacy of an innovative business in the eyes of investors and market product distributors. When seeking financing, a market for their products and the requisite certification for their devices, entrepreneurs call upon opinion leaders, key figures in the Medtech sector. Crucial players in the dissemination of new products (Van Eck *et al.*, 2011), they are capable of influencing the opinions, attitudes, motivations and behavior of others, and define themselves as “people in a social network who, in the diffusion of product and technologies, have greatest influence on their acknowledgment or adoption by other people” (Cho *et al.*, 2012: 97). Largely made up of specialist doctors within the medical field of the product in question, opinion leaders provide legitimacy and credibility for both the start-up and the medical device, firstly in the eyes of investors and secondly, of distributors and their customers (Figure 4). Without this specific support, entrepreneurs would be hard-pressed to mobilise the capital required to develop their products or to raise the interest of investors and distributors in their medical applications.

Figure 4: Medical Start-Ups in the Local Environment and the Role of Legitimizing Third Parties



Source: Author’s Own Work.

In opposition to Florida and Kenney's arguments (1988: 124), investors' evaluations of start-ups and their products are not based purely on the criteria of originality, patents or the presence of competitive businesses on the market. On the other hand, investors' valuations are based primarily on quality considerations (in relation to ratings agency certifications) as well as the credibility afforded them by opinion leaders and a product's potential range of applications. Similarly, the legitimisation of these products by opinion leaders occurs in specific locations, notably business platforms (Cooke *et al.*, 2011; Gawer, 2011), represented by trade fairs, specialist shows or medical conferences. These privileged meeting places shape relations between actors by, on the one hand enabling entrepreneurs to present their own business to specialists within the field, and on the other hand, conferring both technical and symbolic value upon the product through the support of opinion leaders.

6. Start-ups as Products

Based on the case of the medical industry in western Switzerland, and more specifically start-ups in the region, we have discerned three key issues (see Table 1) regarding (1) the creation of start-ups and the resources mobilised, (2) new ways of evaluating start-ups, (3) the new spatialities identified.

Firstly, start-ups are primarily born of entrepreneurial instinct, which follows on from an entrepreneur's higher education. Unlike the traditional creation of innovative companies by the *intrapreneuriat* (Hatchuel *et al.*, 2009; Hulsink and Manuel, 2006), the creation of innovative Medtech businesses is less dependent on the entrepreneur's having prior experience in a relevant business. In fact, it is often the result of an individual attempting to respond to real-life problems that they have encountered, and the desire to ultimately make a profit when it is sold to a large group. In this situation, the requisite technologies are often to be found in the region, thanks to its numerous research laboratories. By analogy with Crevoisier (1997), when creating start-ups, entrepreneurs primarily rely upon their own personal network of contacts for financial resources. However, in the product certification and manufacturing phase, it is corporate venture capital (Garel and Jumel, 2005) which is most often relied upon.

Secondly, the territorial aspects of the innovation processes studied and the medical start-ups in western Switzerland indicate that medical devices are now created and developed using resources from both local sources (local capital and technologies) and multi-local sources (venture capital and corporate venture capital). Interactions between regional actors are based on local relationships of trust, similar to those described in the approaches to territorial innovation models (Moulaert and Sekia, 2003). These actors develop networks which enable them to combine regional competencies and to create productive synergies. However, innovative businesses are increasingly part of networks which transcend regional boundaries. Start-ups both need and benefit from multi-local networks in order to attract the requisite financial resources to develop their products and to interact with key market players such as distributors, opinion leaders, etc. Thus, the local anchoring and subsequent development of the innovative business are quite weak following the start-up's acquisition by

a multinational, which often relocates it outside of the region.

Table 1: Two Contrasted Start-up Approaches

		Start-up as nascent enterprise/industry	Start-up as products
Entrepreneurship/emergence		Entrepreneurial project of a productive business	Market solution and entrepreneurial concept incubated after leaving higher education.
Technology		To develop and exploit within production	Made available as a concrete prototype and entrepreneurial concept
Product		Market commodity	Socio-technical component of an entrepreneurial concept
Objective of entrepreneur		Development of a new product (exploitation over the long term)	Selling the start-up to a MNE during the emergence phase (added value on equity)
Investments		Proximity capital and traditional bank loans	Public and private proximity capital and corporate venture investments
Start-up evaluation		In the product market	Legitimacy of the entrepreneurial concept by intermediaries (credibility, trust of opinion leaders, etc.) and financing actors
Territoriality of relations (temporal evolution)	1	Local	Local and multi-local
	2	Supplements coming from elsewhere	Multi-local (selective anchoring)

Source: Author's Own Work.

Thirdly, the ultimate aim of start-ups and those who start them is no longer to develop a new business producing medical devices over the long-term, but rather to create a socio-technical concept to sell on to a large group in the medical industry within the short to medium term. For innovative businesses to attract the attention of these large groups, start-ups require the support of key intermediary figures: opinion leaders. These actors confer legitimacy upon and create confidence around start-ups and their products, enabling them to attract the necessary resources to set up a business and create products. In this particular situation, the start-up's value is not determined solely on technical factors but also on the legitimacy and symbolic value conferred upon it by intermediary actors.

7. What Future Lifecycle Approach to Territorial Competitiveness?

Characterized by much diversified firms, technologies and products, Medtech activities in Western Switzerland are primarily related through their common market orientation. Highly regulated by international technical and safety norms and organized around large strategic players (e.g. hospitals or large medical equipment suppliers), entering such a market is particularly difficult for newcomers. For start-ups, building up own production tools and distribution channels often requires unaffordable investments. In this context, strategic partnerships or mergers with established multinational companies are usually seen as the most pragmatic – when not the only – way to pursue their industrial development.

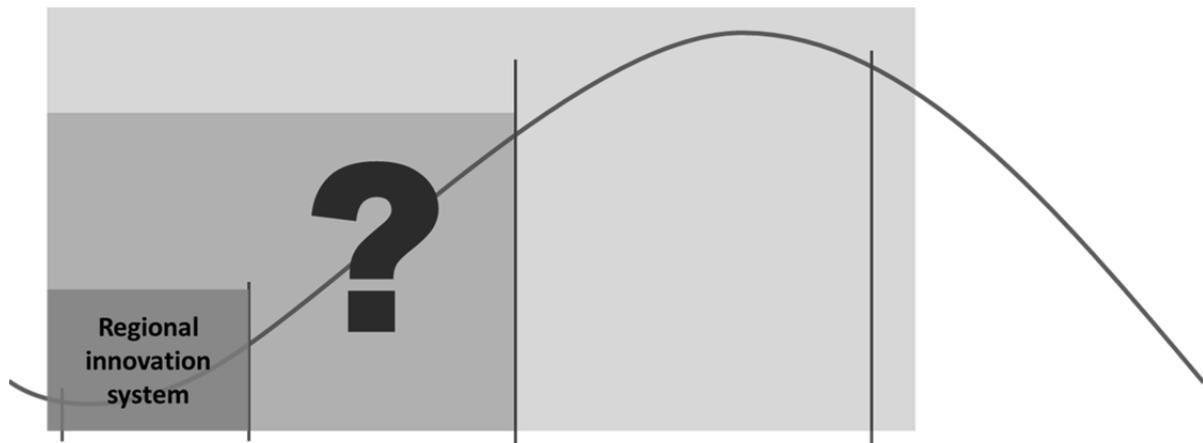
Consequently, start-ups tend to be conceived, from their creation, as products commoditized and qualified by various socio-technical devices in market (e.g. certificates, awards or opinion leaders). If such a phenomenon is particularly enhanced in the context of Medtech activities, more general considerations and concerns for territorial innovation can be drawn out of this specific case.

If the dual dimension of start-ups, either as ‘nascent enterprises/industries’ or as ‘products’, is usually recognized, territorial innovation models and policy (best) practices traditionally tend to associate their emergence and growth with the development of local industries, either as industrial pioneers or as innovative spin offs embedded in particular regional production systems. This vision reflects a spatial division of labor ‘pushed’ by innovators and investors originating from developed countries. This also postulates a limited mobility of production factors (e.g. firms, technologies, workers) during the growing phase of regional innovation.

Adopting such approach to our particular case could lead to interpreting the case of Medtech activities in Western Switzerland as the possible emergence of a new cluster supposed to develop and create new competitive enterprises and industrial boundaries; meant to provide new regional growth of revenue and employment in the region. In other words and by analogy to the canonical model of the Silicon Valley, we may be witnessing the emergence of the Swiss ‘Medtech Valley’.

However, such an interpretation could fall short of a pertinent analysis when considering future challenges for regional development. A greater emphasis on start-ups as ‘products’ raises new avenues for research and policy approaches to territorial innovation and competitiveness. Three fundamental open questions seem to us crucial to be examined in this regard.

Figure 4: What new lifecycles of territorial growth?



Source: Author's Elaboration.

Firstly, *will regional innovation systems be confined to short run project lifecycles of emergence and reemergence?* In the Medtech case depicted above, entrepreneurial projects consist more and more in combining existing knowledge (science-, technology- and culture-based) within a business idea and in advertising it through a start-up concept elaborated to generate itself a profit. Such an analysis mirrors a knowledge-based economy marked by permanent innovations where the constant renewal of entrepreneurial projects become the key factor of competitiveness. In this view, more stable phases of industrialization tend to be shaded by a focus on perpetual sequences of emergence and reemergence. Beyond a lifecycle approach, future research avenues and policy issues will have to be able to identify the industrial dynamics of growth induced, or not, by this 'project ecology' (Grabher 2002b) and to understand how they contribute, or not, to broader regional innovation systems.

Pursuing a same line of reflection, a second provocative question arises: *will commoditized entrepreneurial projects become the new revenue model of lead innovative regions?* Regional competitiveness is usually conceived as the capacity to produce innovative goods or activities and to export them to distant consumption markets. Sold as products, entrepreneurial projects become themselves commoditized revenues for innovative regions. Within global production and financial networks, innovators and investors are, nowadays, not only situated in developed countries. Highly mobile, knowledge and financial resources circulate and anchor across territories, pulled by foreign direct investments chasing most attractive innovations and entrepreneurial projects. Purchased in their early phase of emergence, innovations can be relocated more easily, according to the corporate strategy of multi-national companies. In this sense, depicting today's territorial revenue models should be at the core of future research and policies agendas to understand how regional wealth is actually created. Traditional export-base models of growth will certainly have to be reconsidered in this examination.

Finally, these two fundamental questions underlie a more general exploratory question: how can current regional innovation systems position themselves within global networks to attract

and anchor knowledge and financial resources? As pointed out in the case of Swiss Medtech start-ups, being competitive today is not just being innovative. Territorial policies of knowledge creation and transfer are certainly influential factors of competitiveness. However, as illustrated above, local innovation is also about being able to advertise local entrepreneurial projects to global players and investors. It is also about thinking how these projects and the revenue they generate can instigate new projects as well as stimulate broader industrial growth within regions.

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