Institutional Agency and Path Creation
An Institutional Path from Industrial to Knowledge City

1 Introduction
In this paper, we argue there is a need to focus more explicitly on institutions and related agency to understand better path creation. Many studies have shown how institutions mediate in subtle but pervasive ways economic development and path creation. Institutions frame the choices and actions of many actors as well as their interaction, and consequently, it is institutions that frame emergence of new industrial paths and are potential sources of lock in. More specific conceptualisations of institutional agency and related strategies are called for, as path creation is about (a) releasing the future potential beneath existing institutions and (b) institutionalising the released potential. Understanding institutional agency in the context of path creation is crucial, as it aims to mould, simultaneously being affected by, many kinds of history informed social practices and routines.

We follow Dawley (2014, 92) who stresses the importance of moving beyond firm-centric accounts on path creation, and study “a wider array of actors and multi-scalar institutional contexts that mediate the emergence and development of growth paths”. We also follow Isaksen (2015) who argues new regional industrial path development includes path renewal and path creation. We extend his view beyond the growth of new activities and new industries via regional branching (path renewal) and the growth of entirely new industries (path creation) to include also institutional path creation. It would serve us well if we knew more about institutional strategies of both local, national and international actors, and learn more about how they influence each other in time. Sotarauta (2016) argues that these issues, and the secrets of institutional path creation, may be best tackled by adopting an actor-centric bottom-up view on institutions to complement the dominant top-down view. The main ambition in an actor oriented approach is to strengthen the way the concepts of institution and institutional agency can be used as analytical tools to investigate path creation, and relationships between agency and institutions.

From these premises, we investigate the core concepts related to path creation and institutional agency and ask what are the main institutional strategies adopted by intentional actors, independently or in collaboration, in their efforts to boost institutional
path creation and renewal. We scrutinise these questions in the context of a knowledge city
development and use Tampere, Finland as a case in point. We focus on the main
institutional changes and related agency shedding light on how Tampere was transformed
from an industrial to knowledge city. Carillo et al (2014) maintain that one of the key
ingredients of any knowledge city are high quality higher education institutions that provide
education and carry out scientifically high quality but also economically and socially relevant
research. Relatedly, we focus special attention on how Tampere became a ‘university town’
and how university industry collaboration became one of the defining features locally.

We continue here our efforts to appreciate the ways local actors work to construct local
institutional arrangements but focus on institutional meta-strategies instead of following
our earlier more detailed studies on agency, institutions and strategies. The case is rather
illustrating the conceptual discussion and suggesting future avenues of research than
providing conclusive empirical evidence for institutional agency and path creation. In line
with Dawley (2014), we believe that by dismantling and making sense of long processes of
regional evolution and path creation we would learn much not only about local and regional
development but also the relationships between institutions and agency.

This paper is a re-analysis of an extensive empirical data that has been collected for four
independent research projects (see Kostiainen & Sotarauta 2003; Sotarauta & Mustikkamäki
2015; Sotarauta & Heinonen 2016; Suvinen 2014). The data is based on (a) the secondary
data including written material from the Internet; relevant journals; dozens of related
newspaper articles; respective policy documents from different levels of governance;
various business, technology and other strategies related to the national, regional and local
level industries; funding decisions of external funding bodies as well as minutes and other
official documents from critical junctions in time; and (b) altogether 77 interviews with key
actors.

2 Towards a bottom-up approach to institutional change

2.1 The basic tenets of institutions

Institutions are habitually defined as recurrent patterns of behaviour (habits, conventions,
and routines) (Morgan 1997) and socially constructed rule systems or norms that produce
routine-like behaviour (Jepersson, 1991). North simplifies institutions as the rules of the
game (North 1991). Martin (2000) makes a distinction between the institutional
environment and institutional arrangements, and defines the institutional environment
consisting of generic social conventions, rules and routines, which determine the informal
incentives of innovation systems. Institutional arrangement shapes specific institutional
forms defining ways political choices and policies are framed, and how formal economic
incentives are identified and enacted (Rafiqui 2009).

Usefully, Scott divides institutions further by using three pillars that are regulative,
normative and cultural-cognitive (Scott 2001). The regulative pillar underlines those rule
settings, and rewarding and sanctioning activities that regularises and constrains behaviour
and hence influence future behaviour. The normative pillar, on its part, contains values and
norms. It points up rules introducing an obligatory and prescriptive as well as evaluative
dimension into behaviour highlighting factors that aim at preferred and/or desirable

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1 We express our gratitude to Nina Mustikkamäki and Tuomo Heinonen who carried out 52 interviews.
behaviour. It also includes standards on which existing values and norms are built on (Scott, 2001, 51–54). The cultural-cognitive pillar reminds how external frameworks shape internal interpretation processes (Scott, 2001, 57). Cognitive-cultural institutions frame the way actors see, interpret and understand themselves as well as their actions and positions in wider structures.

The kinds of institutional changes framing journeys from an industrial to knowledge city are sometimes approached as if institutional changes were easily detected and explicitly initiated and directed by market-based entrepreneurs or policy makers. Of course, in the case of Tampere, it would be easy to list some of the critical incidents, such as establishment of the universities, a science park, some national and local development programs, reorganisations of firms, changes in legislation affecting local development, etc. These are beyond any doubt crucial junctions in a long journey, and some of them are mentioned below, but the true nature of institutional path creation cannot be fully appreciated analysing only the changes in formally defined top down institutions. But, it goes without saying that, in the course of decades, the Finnish institutions regulating and setting normative expectations for science, technology and innovation were both transformed and fine-tuned top-down, and towards the 1990’s the institutional arrangements eventually changed to centre explicitly at innovation.

2.2 Path dependency and institutions

Regional studies community has shown growing interest in how socioeconomic systems change over time, and a series of studies using metaphors, ideas and models drawn from evolutionary sciences has emerged (see e.g. Boschma & Martin 2010). Consequently, among many other concepts also path dependency has become a household term in regional development studies, reflecting on its part the evolutionary turn (Martin, 2010; Djelic & Quack, 2007).

Path dependency reminds, as Djelic and Quack (2007, 161) put it, “events occurring at an earlier point in time will affect events occurring at a later point in time”, or putting it slightly differently, path dependency “explains a current state of affairs from its history” (Boschma & Frenken 2006). In a stronger sense, “path dependency characterizes historical sequences in which contingent events set institutional patterns with deterministic properties into motion” (Djelic & Quack 2007, 161-162). Path dependency explains how existing institutions preserve what already is there, and how economic restructuring may be slowed down because of that, and how indigenous potential and creativity in regions may not be fully developed nor exploited. As Martin (2000) reminds, institutions preserve social practices and routines, and hence they are the carriers of history passing institutional ingredients from history into the future. Importantly, Martin (2010) argues that the path dependence model, in its dominant lock-in oriented form, affords a restrictive view on local and regional industrial evolution. He shows how it emphasises more continuity than change. Moreover, there still is much to do to fully understand how an industry emerges, how a new path is created, drawing on resources already existing in a region (Simmie, 2012), or how new unrelated resources and capabilities can be constructed to support path creation (Boschma et al 2016).

Tampere is a city that has experienced several institutional transformations, and witnessed its share of lock-in situations. In the 19th century, it developed from a small village into Finland’s first large-scale industrial city. More than 100 years later it belongs to the
group of leading Finnish knowledge city-regions with its 380,000 inhabitants. It is the second research and development (R&D) centre in the country with a 13% share of national R&D spending in 2015 (public and private), peak year being 2010 with 16% share of R&D in Finland (Statistics Finland: PX-Web Database). Transformation from an industrial to knowledge city has not been a straightforward jump from one era to another but a bumpy road with industrial restructurations and unemployment rate occasionally ascending above 20% or close to it.

Martin’s (2010) canonical path dependence model of spatial industrial evolution can be used to describe industrial evolution in Tampere. The founding of a town in 1779 was a ‘historical accident’, as the two lakes it is located in-between and the rapids flowing through it provided hydro power, and hence an ideal location for industries. Moreover, the King of Sweden, and later the Tsar of Russia provided it with a freedom of enterprise, and thus Tampere became established as a free industrial town (Rasila 1988, 379–398). It enjoyed similar kinds of privileges as only Eskilstuna did at that time of all the Swedish towns; trade and industrial enterprise were unimpeded in these two towns. The industrial path began to emerge due to “development of self-reinforcing autocatalytic processes of agglomeration economies”, using Martin’s (2010, 5) phrasing. Martin’s model proposes that early path creation, stemming from the historical accident, is followed by a path dependent lock-in, which is caused by getting bogged down to increasing returns (agglomeration economies). From the 1970’s to 1990’s, Tampere was in many ways locked into its industrial heritage, and external shocks hit it hard; these included, for example, expanding industrial automation, the oil crises in the 70’s, upheavals in Eastern Europe in the late 80’s and the consequent loss of export markets as well as the severe recession of the early 1990’s. The city struggled to bounce back, but it did with considerable success.

In Tampere, industrial paths consisted of three main developments (with several more specific sub-trajectories not discussed here). First, the earlier dominant textile industry faced difficulties and declined in the 1970’s, and Tampere faced a ‘life-cycle type trajectory’, per Martin’s model (2010, 10). Second, Tampere went through a ‘rejuvenation’, again applying Martin’s (2010) terminology, as the engineering industry faced severe difficulties in the early 1990’s but was able to renew itself and maintain its position by infusing new technology and services to its product portfolio. The third of the main economic trajectories was the rapid growth of the information and telecommunications cluster in the 1990’s. It has, in the 2000’s and 2010’s, faced Nokia’s and Microsoft’s reorganisation and is struggling to renew itself. On its part, it can be labelled as an ‘ongoing change and mutation’ (Martin 2010). Parkinson et al (2012) conclude that continuous reinvention of Tampere was influenced by proactive local development policies, business sector activities and forward-looking, relatively young universities (Benneworth, 2007). In this paper, we focus on the last of the three.

2.3 Institutional agency and path creation
Path creation is a highly complex process involving sequences and accumulation of events over long periods of time. In line with Garud et al (2010), we emphasise the power of reflexive agency and cumulative processes of gradual change as forces in path creation. Garud and Karnøe (2001) emphasise, instead of being given, initial conditions are

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2 Finland was a part of Sweden until 1809 and after that autonomous grand duchy of Russia until 1917
constructed by actors, and thus various incidents shaping paths ought not to be approached as exogenous and manifesting something unpredictable, non-purposive and random but as emergent and serving as embedded contexts for agency. Garud and Karnøe’s framework on path creation and thus also institutional change differs slightly from those that stress more the political nature of path creation (Djelick & Quack 2007) or those that, relatedly, observe institutional change emerging due entrepreneurial efforts of science and policy actors despite the lack of business entrepreneurs (Sotarauta & Mustikkamäki, 2015). As Djelick and Quack (2007) conclude, “different societal actors with different economic and political interests, normative orientations and social identities strive to shape the institutional rules used to govern the overall societal system or specific subsystems”, and thus path creation. In this thinking, what follows is that the many self-reinforcing mechanisms are rather strategically manipulated than simply given from the outside. So, if the path dependency literature highlights how lock in happens through stickiness to a path, the view opened by path creation reminds that lock-in situations are “provisional stabilizations within a broader structural process” but not eternal (Garud & Karnøe, 2001).

Drawing upon Emirbayer and Mische (1998) we define agency as “action or intervention to produce a particular effect”. They highlight interestingly both path dependent and path creative nature of agency by stressing that it is informed by the past but simultaneously channelling action toward the future. As such agency is a temporally embedded process of social engagement calling for good capacity to interpret past habits and future prospects (Emirbayer & Mische, 1998). The complexity of actor constellations means that the paths are likely to develop emergent qualities, i.e., characteristics not directly intended by any of the actors involved but stemming out in direct or indirect interaction of multiplicity of them (Djelic 1998). Therefore, agency is best studied in its full complexity by situating it within the flow of time, as actors often amend their agentic tendencies, and their capacity to intervene is not static in time, and the way they make choices or push for transformation fluctuates in time due to changing situations and their own capacity in relation to continuously changing situations (Emirbayer & Mische 1998, 963).

We dissect institutional agency by two distinct but interrelated concepts; institutional entrepreneurship and institutional navigation. Institutional entrepreneurship refers to conscious efforts to pool and mobilise resources and capabilities to create and/or change institutions (Battilana et al., 2009). As Schumpeterian entrepreneurs, also institutional entrepreneurs grasp new opportunities and emerging combinations of knowledge and markets. Their major faculty is the will to accomplish something (Weik 2011, 470). Entrepreneurs’ primary interest is to, as Weik (2011, 470-471) puts it, “map unknown terrain, to move where no-one dared venture before”. Entrepreneurs are not inventors who create new possibilities but the ones who aim at the practical execution of them. Entrepreneurs are thus involved in non-routine strategies, and in doing so they meet with social resistance of those who want to defend the prevailing institutions (Weik 2011, 471).

Institutional navigation focuses on the ways actors deal with mixed messages of many institutions, and comply with them while all the time formulating and implementing their own strategies. Institutional navigation allows us to understand institutions and institutional manoeuvres through the experiences of those actors who are not necessarily able to mould institutions but who are aware of their effects and work to navigate through often conflicting institutional arrangements (Sotarauta 2016a). In practice, the concepts of
institutional entrepreneurship and navigation overlap and do not describe the static functions of actors but forms of agency and the ways how agential roles fluctuate in time.

3 Institutional agency and meta-strategies - from institutional opportunism to institutional offensive

We discuss broadly institutional evolution in Tampere but select few incidents that, per many other analyses (see e.g. Parkinson et al 2012), illustrate well the nature of institutional changes in this specific case. As said above, we do not focus on industrial but institutional path creation that provides the local playground and rules of the game for the prospective industrial path developments. Therefore, the phasing reflects institutional agency rather than changes in industrial trajectories, the aim being to specify a generic top-down description with the agency oriented bottom-up observations.

The institutional influences shaping path creation are like a tide, going back and forth. The Webster’s dictionary defines tide as “the alternate rising and falling of the sea ... due to the attraction of the moon and sun”. Tide is also “a powerful surge of feeling or trend of events”. Inspired by this, institutional tide is here seen as the alternate rising and falling of belief systems due to the attraction of models in global circulation, top down institutions and the local needs. The phases of institutional tides and related agency discussed here are as follows:

- Working against the institutional tide with an opportunistic institutional strategy
- Adapting to a turning institutional tide with an institutional protection strategy
- Going with the institutional tide and exploiting the innovation hype with an institutional expansion strategy
- Launching an institutional offensive

The institutional strategies introduced here are not actual planned or deliberate strategies but rather long term meta-strategies that can be identified in retrospect. Of course, meta-strategies paint an unnecessarily neat picture of institutions and path creation. In practice, they always include arrays of deliberate strategies of many actors, and many kinds of incidents as well as conflicts and moments of joy. Meta-strategies are used to illustrate overarching development patterns that provide the many other strategies with a broader meaning and link to agency in the long run.

3.1 Working against the institutional tide with opportunistic institutional strategy

Universities are institutions in their own right. They frame the local action and choices of many actors in many ways, generate new opportunities and attract knowledge and insights from afar. The history of higher education and scientific research in Tampere is short, dating back to the 1960’s. From the late 1950’s to early 1980’s, the Finnish higher education system grew rapidly by expanding spatially, and the Government established new universities in different parts of Finland to secure equal opportunities to education and promote balanced economic development (Tirronen 2005). Instead of being a beneficiary of national level decisions, Tampere had to rely on local agency, and it basically ended up usurping two universities from Helsinki. First, following colourful events and cunning ploys the local actors successfully convinced a small private College of Social Sciences to relocate itself from Helsinki to Tampere in 1960 (see Seppälä 1998). In 1966 it was renamed to the University of
Tampere. As the local desire for higher education in engineering dated back to the 1850’s, soon after having acquired the College of Social Sciences, the City Government began to fulfil another ‘institutional dream’. In 1964, it established a committee to formulate a strategy to have also a technical university in the city (Wacklin 1995, 16). This ambition was supported by the local conviction of the need to generate new industrial fields. The institutional dream materialised in 1965 when a filial unit of the Helsinki University of Technology was established in Tampere. The rector and the board of the Helsinki University of Technology were in favour of establishing a filial unit in Tampere but the professors and the Union of the Electrician Engineers did not support it (Wacklin 1995, 16-17). As planned by the local actors already in advance, the filial unit was made an independent university of technology already in 1972 (Ahonen, 1993; Wacklin 1995, 53; Ayres 2005). As every university in Finland, the two new Tampere-based universities became state universities in 1974 (Kaarninen, 2000).

Usurping the two universities from Helsinki was not actually supported by the Government but it was not forestalled either although the process met also resistance. In a way, in the early days of its knowledge city strategy (not explicitly defined as such yet), Tampere applied a strategy that can retrospectively be labelled as institutional opportunism. Institutional opportunism is a strategy of knowledge-race coevolution, in which a weaker party taps into a stronger ecosystem and aims to exploit it to strengthen its own institutions. Tampere tapped into the strongest science concentration in Finland and quickly constructed a local institutional capacity for the future. As has been shown in retrospect, the universities have played a central role not only in the attractiveness of the city but more specifically in several industrial path developments; including rapid growth of the ICT industry in the 90’s, upgrading of the engineering and automation industries since the early 1990’s and emergence of medical technology and optoelectronics.

All this was supported by, to highlight cases in point, first, the two universities’ efforts to profile themselves differently from the other Finnish universities by establishing future oriented professorships starting already in the 1960’s. For example, the professorship in computer sciences established at the UTA in 1965 was the first in the Nordic countries. There were also other fields of study where the two universities pioneered (Kaarninen 2000, Häikiö 2015). On its part, the strategy adopted by the universities paved the way for new fields of industry to emerge in following decades. Second, the local level understanding of enhancing especially the technological skills of the local labour force met soon the national level policy to increase the overall number of the university students in the country. The two Tampere-based universities started to grow rapidly.

Third, the early institutionalisation of the university industry collaboration proved to be crucial for subsequent industrial path creation. The Tampere University of Technology has since day one been emphasising collaboration with industry and labelled itself as a ‘university for industry’ (Häikiö 2015). In the early days, however, the institutional arrangements from above were not supportive at all and close collaboration between universities and industries was not seen desirable. On the contrary, it was considered as a threat to the purity of science, and the Ministry of Education regulated strictly against academic research services for companies (Häikiö 2015). The restrictive policy concerning collaboration with industries was locally deemed harmful, and indeed, despite strong institutional pressure from above, Tampere University of Technology continued its collaboration with firms. As Hassi says: “if discrepancies of interpretation occurred with the
Ministry, the interpretations were consistently made in the university” (Hassi, 1993, 381–382). Interestingly, at best, the negotiations with a company about a specific research project were completed in a single day, and thus before getting a final decision from above, slowly administrated and often negative, the project was already completed (Seppälä, 1998, 221–222).

However, the question was not only about unfavourable national institutional arrangements regulating university industry collaboration but also the structures supporting collaboration were minimal even until the mid 1980’s. Interaction was quite largely based on (a) close personal level contacts between professors and leaders of industry; (b) an explicit conviction that strengthening local institutional capacity is important for the future, and that close collaboration in several technology fields is an imperative; and (c) cunning institutional navigation of local leaders to work against the will of the Ministry without harming the future of the university. Indeed, the obstinacy of the city government was decisive in getting two universities in town, and the obstinacy of TUT was crucial in securing its role as a ‘university for industry’.

In sum, regulative and normative top down institutions regulated against university industry collaboration and Tampere was not in a position to receive a government established university. The local leaders in Tampere were convinced of the need to have universities, on the one hand, and that universities were needed not only for education and science but for city and industrial development too. Local cognitive-cultural institutions concerning higher education institutions and collaboration between universities and industries conflicted somewhat with the national institutions, and proactive local agency proved crucial.

3.2 Adapting to a turning tide with an institutional protection strategy

If the 1970’s was characterised by a strong top-down regulation and normative institutional pressure against university-industry interaction, in the 80’s the institutional environment and thus also institutional arrangements began gradually to turn to become not only less hostile towards university-industry collaboration but to emphasize its significance. Suddenly, the still smallish science and innovation community in Tampere was well positioned to exploit the changing national institutions and gradually increasing R&D funding, and the opportunistic strategy was left behind and the institutional protection began.

In Tampere, as well as in some other Finnish city-regions technology centres and technology transfer agencies were founded and more proactive local business development strategies adopted in the 1980’s (Linnamaa 2002; Männistö, 2002; Pelkonen, 2005). Normally, this this kind of phase might be characterised using policy or organisational terms but from an institutional perspective the question was about taking several steps forward in institutionalising university industry interaction, in other words, protecting it against other ideas requiring public attention and funding. As protection refers to efforts to preserve something, institutional protection is an elemental part of an institutionalisation process, as institutionalisation refers to “a process of a new practice, activity, norm, belief, or some other institution, becoming an established part of an existing system, organization or culture” (Sotarauta & Mustikkamäki 2015, 343). There was no need to protect the two universities as such, as they had earned their place in the Finnish higher education system, but there was a need to establish new structures and mechanisms to secure well-functioning but non-structured university industry interaction and take steps forward. By protecting
institutionally university industry interaction the aim was to attain a higher degree of resilience, and thus also such collectives of actors were added in the local system, whose mission it was to develop but also protect new social practices.

Even though the national institutions became more permissive in the 1980’s towards university industry interaction, and local structures supporting it were constructed, the somewhat conflicting situation prevailed. For example, organisations under state government (incl. universities) were not allowed to own property, make commercial acts or establish specialised companies to take care of certain functions. As the hands of the universities were still somewhat tied, locally emerging support communities often lead by the local government proved to be important. Many of the new mechanisms institutionalising university industry collaboration were initiated by local government in collaboration with other stakeholders and were based on extensive collaboration between firms, public sector actors and higher education institutions. Eventually, the new models led to a situation where many of the Finnish universities have not been strategic in their own engagement efforts, as there usually is a network of actors around them constructing collaborative models with, and for, them.

In sum, the tide beginning to turn, cognitive-cultural institutions supporting interaction between industries and universities complemented by several regulative and normative ones were constructed but were still in their early stage of development, and several institutional discrepancies remained sending conflicting messages to local actors.

3.3 Exploiting the innovation hype with an institutional expansion strategy

In the early 1990’s, the institutional tide turned more comprehensively and Finland became a star pupil in the global class of innovation students. The policy emphasis was laid on innovation and thus also university industry interaction was stressed. The policy focus shifted explicitly on global competitiveness, innovation systems and clusters, and formal institutional arrangements began to be transformed and expand accordingly. Indeed, Finland was among the few countries in the world that began to construct a new type of innovation and cluster oriented policies already at that time (Sotarauta 2012). Lemola (2016) labels the 1990’s as a ‘golden decade’ of the Finnish innovation policy but reminds that the tide indeed started to turn in the 1980’s and seeds for change were planted even earlier also nationally. Prior to the economic recession of the early 1990’s, Finnish public R&D policy focused primarily on individual enterprises and macro-economic factors rather than the contexts of innovation (Romanainen 2001, 381). The new policy meta rationale was reflected in the idea of looking at the innovation process and policies from a broad perspective spanning education and science to the innovative activities of firms and the commercialization of technological innovations (Miettinen 2002).

In the expansive phase, the public policies related to STI grew at all levels of governance, and all this was enhanced also by the fact that Finland joined EU in 1995. It is not possible to introduce all the institutional changes that aimed at boosting technology and innovation, but, we illustrate the thinking of that time using national and local development programs as cases in point. They provided a national and local context for increasing collaboration between the main parties and aimed at boosting specialisation. Nationally, these included the Centre of Expertise Programme (1994-2013), Centres of Excellence for Science, Technology and Innovation (2006-2016/17) and the Technology Programmes of Tekes. The programmes constructed a platform for an ongoing dialogue between (a) national and local
policy actors; (b) public sector, firms and universities across the governance levels; and (c) public sector, firms and universities locally. In a way, they were efforts to create focused and co-ordinated ‘multi-scalar triple helix policies’ to support clustered specialization. The flagship programmes were tools in network management to cross the institutional divides. To complement the national programmes City of Tampere launched a series of local development programmes to further develop the strongholds of the local economy, provide platforms for collaboration and collective contemplations, and continuously search for new directions. The local programmes focused on information society (2001-2005), biotechnology (2003-2009), creative economy (2006-2011) and open innovation (2012-2018).

All in all, Tampere was quick to exploit the more supportive national institutional arrangements for science, technology and innovation as well as continuously expanding R&D funding, and the rapid growth of the Finnish ICT –cluster dominated by Nokia. Tampere became one of the hotspots of Nokia-led growth with the Helsinki and Oulu city-regions, and indeed, R&D expenditure grew from 1995 to 2010 by 481%, having been in a slow decline since then (Table 1).

**TABLE 1.** The increase of R&D expenditure (€mil) in Finland and city-regions of Helsinki, Tampere and Oulu, and the shares of the leading city-regions (Statistics Finland: PX-Web Database)

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<tr>
<td>Finland</td>
<td>2172</td>
<td>100</td>
<td>4423</td>
<td>100</td>
<td>5474</td>
<td>100</td>
<td>6971</td>
<td>100</td>
<td>6071</td>
<td>100</td>
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<tr>
<td>Helsinki</td>
<td>1027</td>
<td>47</td>
<td>1965</td>
<td>44</td>
<td>2275</td>
<td>42</td>
<td>2958</td>
<td>42</td>
<td>2842</td>
<td>47</td>
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<tr>
<td>Tampere</td>
<td>189</td>
<td>9</td>
<td>606</td>
<td>14</td>
<td>835</td>
<td>15</td>
<td>1099</td>
<td>16</td>
<td>758</td>
<td>12</td>
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<tr>
<td>Oulu</td>
<td>174</td>
<td>8</td>
<td>493</td>
<td>13</td>
<td>688</td>
<td>13</td>
<td>935</td>
<td>13</td>
<td>633</td>
<td>10</td>
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<tr>
<td>Turku</td>
<td>141</td>
<td>7</td>
<td>268</td>
<td>6</td>
<td>317</td>
<td>6</td>
<td>379</td>
<td>5</td>
<td>345</td>
<td>6</td>
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<tr>
<td>Others</td>
<td>641</td>
<td>29</td>
<td>1091</td>
<td>25</td>
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<td>1601</td>
<td>23</td>
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In addition to witnessing the rapid growth of the ICT –cluster, in which also the universities played a central role, the expansive phase also saw other specialised industrial paths emerging. For example, a locally new industry, optoelectronics, emerged from one of the research groups of the Department of Physics. The key actors were able to institutionalise it and expand on the platforms constructed earlier. Eventually, an optoelectronics industry with several spin-off firms, a specialized intermediary organization and related research activities became rooted in Tampere (Suvinen 2014). Another case in point is regenerative medicine (human spare parts industry), which, from a humble beginning of the late 1990’s, has become one of the nationally acknowledged profile areas with a joint research institute of the two universities with more than 250 scientists. It represents a new field of science and potential new industry that is an outcome of specialization based on integrated institutions of the two universities and strong national support (see Sotarauta & Mustikkamäki 2015, Sotarauta et al 2016). Also, mechanical engineering and automation industry, often in collaboration with TUT, was able to upgrade their offerings and thus survive hard times.
If the institutional opportunist and protection were essentially reinforced by individual actors, small active groups and accelerated by their interaction, in the expansive phase the question was not only about increasing volumes of resources but also institutionalisation of knowledge and innovation oriented thinking more broadly in Tampere. Even though Tampere had constructed local institutions for science and innovation, renewed, protected and expanded them, still in the 1990’s the new thinking was not fully institutionalised in local policy spheres (Kostiainen & Sotarauta 2003). The strong perceptions and local collaboration patterns shaped by the industrial culture and traditions slowed down institutional transition in cognition from industrial to knowledge city, and the new perspectives were constantly confronted by the supporters of the old order. But, step by step, the institutional changes initiated earlier started to pay off, and the change was manifested in several local economic development strategies and specialised development programmes. The new institutions crept in, and when the changes in the economy and top down institutions providing the country with normative directions moved to highlight STI, also Tampere began more broadly to understand its own institutional strategies.

Interestingly, despite top down institutions becoming favourable to university industry collaboration, some institutional conflicts have remained. While the university act maintains explicitly that the Finnish “universities must interact with the surrounding society” (MoE), interaction is not supported by the funding system that is used by the Government to allocate funding from the state budget to universities. All the 13 indicators emphasise excellence in research and education, none engagement, and therefore there is an increased tension between research excellence and various forms of engagement. Only time will tell whether strong university industry interaction will prevail in Tampere or will the strong funding related regulative institutions guide universities to focus more and more on scientific excellence even though the normative institutions demand otherwise.

3.4 Launching an institutional offensive

After the expansive phase, Finland has moved to a no growth era in its R&D. Both the public and private R&D expenditure has been in decline in the 2010’s, and it seems that the innovation policy community of Finland is reaching beyond the R&D oriented STI – dominated policy and is seeking to find inspiration from such concepts as innovation platform and innovation ecosystem. It is too early to assess where the policy thinking is heading and what kind of institutional agency is in the making. Also in Tampere, the new approach revolves around innovation ecosystems and platforms, and again new ways to organise local development work are sought. At this point of time, it is difficult to know whether the question is about minor deviations or somehow novel ‘policy paradigm’ in making.

From institutional perspective, the most important of the latest institutional strategies is the prospective amalgamation of the University of Tampere, the Tampere University of Technology, and the Tampere University of Applied Sciences that is planned to take place in 2019, and create a university with more than 35,000 students. The amalgamation of the most social science oriented Finnish university with the most engineering one is a story of its own, especially when the forthcoming higher education concern crosses the strictly regulated gulf between research universities and polytechnics (universities of applied sciences). Our data does not cover the latest phase, and thus we need to be content with acknowledging that the initiative was made by the University of Tampere, and that it has
gained wide support from the Government and the Ministry of the Education and Culture as well as local stakeholders. It should also be acknowledged that the amalgamation process in itself is a bumpy road with many kinds of incidents. At all events, the main objectives of the amalgamation are to provide students, scholars and scientists with new learning environments as well as multidisciplinary platforms for producing new types of combinatorial knowledge. And of course, perhaps most importantly, the ambition is to secure institutionally the national position as the second largest higher education, science, and innovation concentration in Finland. Additionally, at least implicitly, the objective also is to challenge the dominant position of the capital city. An institutional opportunist has launched an offensive.

4 Discussion

Market-related entrepreneurial agency is usually considered as important in the early phases of industrial path creation. Relying on Mazzucato (2014), we emphasise the need to acknowledge, identify and analyse the institutional influences not only constraining but making the market-related entrepreneurial agency possible. In line with Holmen and Fosse (2017), we argue the early stages of new path creation can be explained by both institutional factors and/or the strong presence of entrepreneurial agency, and emphasise institutional agency shaping the rules of the game and the playground for industry oriented efforts. Not only economic agency shapes emergence of new paths but many kinds of agency is involved and needed (see also Dawley 2014). The main difficulty here is to identify the significance of institutional agency of the past for industrial path creation of today. For example, the local actors in Tampere have been cultivating local institutions for science, technology and innovation since the 50’s, and thus they have been engaged in simultaneous capacity building here and now and cultivation of local conditions for serendipitous developments in the future. Many developments that appear to many as accidental or pure luck have in fact been influenced by institutional agency years or decades earlier.

We have used a broad brush to illustrate the institutional changes and related agency in Tampere to discuss how institutions are moulded in the long run, and how fruits of the institutional meta-strategies become visible much later. Labelling a complex series of development phases and related incidents as a shift from institutional opportunism to protection to expansion to offensive is an outright simplification of decades long institutional evolution. It contains several specific institutional and industrial trajectories, and endless series of decisive incidents. As such, the case under scrutiny supports the view that institutional change is not straightforwardly ‘Lewinian’ by nature (melt the old, change, freeze again [Lewin 1951]) but Confusian that is processional and as such continuously equilibrium seeking (Weick & Quinn 1999). We suggest, inspired by our case analysis as well as Streeck and Thelen (2005), new institutional arrangements creep into the old institutions. Continuous combination of abrupt as well as incremental institutional changes are neither transformative (path creative) nor reactive/adaptive for the protection of the past path but simultaneously both. Institutional agency operates in the nexus of past, present and futures as well as many kinds of institutions.

Especially in the early phases of new institutional developments, institutional entrepreneurship and related navigation often are an unplanned, highly personal and intuitive forms of agency (Ritvala and Kleymann 2012; Sotarauta & Mustikkamäki 2015).
Actors simply do what they believe must be done without fully realising what might follow and what kinds of institutions they end up confronting, on the one hand, and explicitly changing, on the other hand. And when the time is right it is possible to establish new organisations or carry out other institutional reforms that on the surface appear as new and fresh but that have been boiling under the institutional surface for some time before surfacing. It is possible to identify the core institutional entrepreneurs in different phases, and detect master navigators, but as important it is to acknowledge that they did not accomplish their ambitions alone nor quickly. In Tampere, several institutional entrepreneurs and navigators paved a way for institutional expansion and offensive by shaping the local institutional arrangements by forging new structures, constructing collective belief system, enriching dialogue between the main players but also renewing identities step by step. In a way, they were champions of creeping change. Actors collectively learnt new ways of thinking and constructed such new interpretations of themselves and the city that transformed cognitive-cultural institutions, and in time were institutionalised regulatively and normatively too that again shaped cognitive-cultural institutions. Reinterpretation is crucial as the institutional influence from above sanctions, one way or another, actions deviating from what is framed as suitable (Battilana et al 2009), which, more often than not, leads to compliance, as local actors tend to bend to a wish, regulation or other institutional factor from above. But, as was shown, in some cases, the local actors may successfully challenge the top-down influence and benefit it later. Of course, it always is a risk to challenge institutional influence from above but that is what institutional entrepreneurs do; they see opportunities and take risks. The creeping nature of institutional change easily shadows all the institutional manoeuvres made earlier in time. The four meta-strategies – institutional opportunism, institutional protection, institutional expansion, institutional offensive – contain many kinds of influence tactics ranging from coercion to networking to reinterpretation to belief formation to knowledge justification to professionalization to lobbying, etc. This kind of multi-dimensional and deviative behaviour is a challenging form of local agency and cries out for skilled institutional navigators who construct local institutions while navigating through top down influence without damaging prospects. At all events, entrepreneurial activity is by necessity at the centre when institutions are consciously shaped for new paths to emerge. As the case Tampere suggests, not only firms but several other types of actors can act entrepreneurially for path development. In addition, in any study on institutional agency, there is a need to be open to recognise the potentially unintended effects of complex social processes, and thus the emergent qualities of institutional change processes. Institutional path creation is a political process.

5 Conclusions

This paper corroborates earlier studies showing institutional agency is a patchwork of action, and institutional entrepreneurship is a collective and processual form of agency (Ritvala and Kleymann 2012; Drori & Landau 2011; Sotarauta & Mustikkamäki 2015). It is collective as actors are both directly and indirectly dependent on each other’s activities (also temporally). Often they do not even see the interdependencies but simply build on what there already is without recognising the ways institutions were moulded to allow new phase to unfold. Institutional entrepreneurship and institutional navigation are not to be located in the
attributes of individual actors but in the relationships connecting actors in the emerging institutional path. We add to the earlier literature the notion of institutional navigation, i.e., the ways actors navigate through multi-layered and conflicting sets of institutions. Organized institutional navigators not only comply with institutions but when consciously aiming to find their way through them they simultaneously end up promoting creeping change. Institutional navigation is a gentle form of institutional entrepreneurship.

As institutions are notoriously difficult to operationalise, and as institutional theory still operates at an abstract level (Rodríguez-Pose 2013), in regional innovation system studies, institutions are often specified using “pre-defined lists” of institutions (Grillitsch, 2014). They are relevant to take hold of, but, as stressed throughout this paper, we might lose analytical power by focusing only on normative and regulative aspects of top-down policies as well as cognitions prevailing at the national level. It might be impossible to fully appreciate the current position of Tampere, for example, without scrutinising local institutional strategies in relation to the top-down influences. It is believed here that to fully grasp the complex socio-politico-economic nature of path creation and related institutionalisation we need to reach beyond top-down view on institutions and seeing only the national layer of them, and find ways to study institutions bottom-up, through the intentions, strategies and preferences of local actors. As Sotarauta (2016) points out, “if we focused solely on the top-down effect of institutions, we would neglect the diversity of actors and assume that they are all the same, while it is institutions that differ.”

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