Online-Appendix zu

„Depolarizing Innovation: Dynamic Policy Implications for Entrepreneurial Ecosystems in Second-Tier European Regions"

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Appendices

Appendix 1: Domains of an Entrepreneurial Ecosystem

Policy	Finance	Culture
Government	**Financial Capital**	**Success Stories**
• Institutions (e.g. investment, support) • Financial support (e.g. for R&D, jump start funds) • Regulatory framework incentives (e.g. tax benefits) • Research institutes • Venture-friendly legislation (e.g. bankruptcy, contract enforcement, property rights, and labour)	• Micro-loans • Angel investors, family and friends • Zero-stage venture capital • Venture capital funds • Private equity • Public capital markets • Debt	• Visible successes • Wealth generation for founders • International reputation
Leadership	**Supports**	**Societal Norms**
	Infrastructure	
• Unequivocal support • Social legitimacy • Open door for advocacy • Entrepreneurship strategy • Urgency, crisis and challenge	• Telecommunications • Transportation and logistics • Energy • Zones, incubation centres, clusters	• Tolerance of risk, mistakes, failure • Innovation, creativity, experimentation • Social status of entrepreneurs • Wealth creation • Ambition, drive, hunger
Human Capital	**Support Professions**	**Markets**
Labour		**Networks**
• Skilled and unskilled • Serial entrepreneurs • Later generation family	• Legal • Accounting • Investment banking • Technical experts, advisors	• Entrepreneur's networks • Diaspora networks • Multinational corporations
Educational Institutions	**Non-Governmental Institutions**	**Early Customers**
• General degrees (professional and academic) • Specific entrepreneurship training	• Entrepreneurship promotion in non-profits • Business plan contests • Conferences • Entrepreneur-friendly associations	• Early adopters for proof-of-concept • Expertise in productising • Reference customers • First reviews • Distribution channels

Figure A1-1: Domains of an Entrepreneurial Ecosystem.
Source: adapted from Isenberg (2011b).

Appendix 2: Model of Entrepreneurial Ecosystem Evolution

	Birth	Growth	Sustainment	Decline
Firm Entries & Exits	• Low firm birth rates • Few to no firm exits • Firm births > firm deaths	• Growing firm birth rates • Growing number of firm exits • Firm births > firm exits	• Declining firm birth rates • Firm births < firm deaths	• Low firm birth rates • Firm births < firm deaths
Policy	Policy oriented towards traditional economic development efforts (clusters, firm attraction and retention). Not yet oriented towards entrepreneurship.	Growing perception among regional policymakers about the need to build EE, first activities to tailor policy towards entrepreneurship.	Dedicated and widespread leadership in support of entrepreneurship is critical to sustain evolution of EE.	Leadership in favour of EE starts to disappear, possibly reoriented towards other types of economic development efforts (boosterism, firm attraction etc.).
Finance	Financial capital is becoming available and starts to be more risk-oriented, but limited in terms of quantity and risk-orientation.	Financial capital is getting easier to access as investors have started to develop trust in EE.	Financial capital still available, but harder to access because trust is starting to decline.	Decline of financial capital.
Culture	• Few success stories • Tolerance of risk and failure not yet developed • Few personalities who stand out as entrepreneurs	Networks among entrepreneurs in the region become important as entrepreneurs are better known. Societal norms may change in favour of EE.	Success stories become critical as firm deaths are starting to increase.	Entrepreneurial culture starts to decline in terms of both success stories and favourable societal norms.
Support	Emergence of pioneering support organisations such as incubators, non-profit groups, entrepreneurship-oriented infrastructure etc.	Non-governmental institutions in support of entrepreneurship start to become more specialised and targeted towards new firm creation.	Non-governmental institutions start to diversify, possibly away from EE support.	Loss of support through non-governmental institutions.
Human Capital	• Education institutions mostly oriented towards general degrees • No serial entrepreneurs	• EE starts to see first serial entrepreneurs • Education institutions start offering specific entrepreneurship training programmes	Decline of serial entrepreneurship.	Entrepreneurship is not seen as a career option anymore.
Markets	• Markets for entrepreneurs not yet developed • Firms (often large firms) in the region do not function as incubators nor are they customers for regional entrepreneurial firms	• Market opportunities for entrepreneurs in the region develop • Also start to see national and international market opportunities	• Market opportunities decline (regionally, nationally and internationally) • Networks start to decline	Market connections and networks disappear.
Policy Implications	• Lowering the hurdles for entrepreneurship • Networking existing and nascent entrepreneurs • Building an entrepreneurship-friendly infrastructure	• Expansion of firm births through support in terms of financial capital • Networking opportunities etc. also important	Strengthening the networks: particularly diaspora and multinational networks.	Avoid lock-in of EE, e.g. through infusion of new ideas and connections to other EEs nationally and internationally.

Figure A2-1: Model of Entrepreneurial Ecosystem Evolution.
Source: adapted from Mayer (2015).

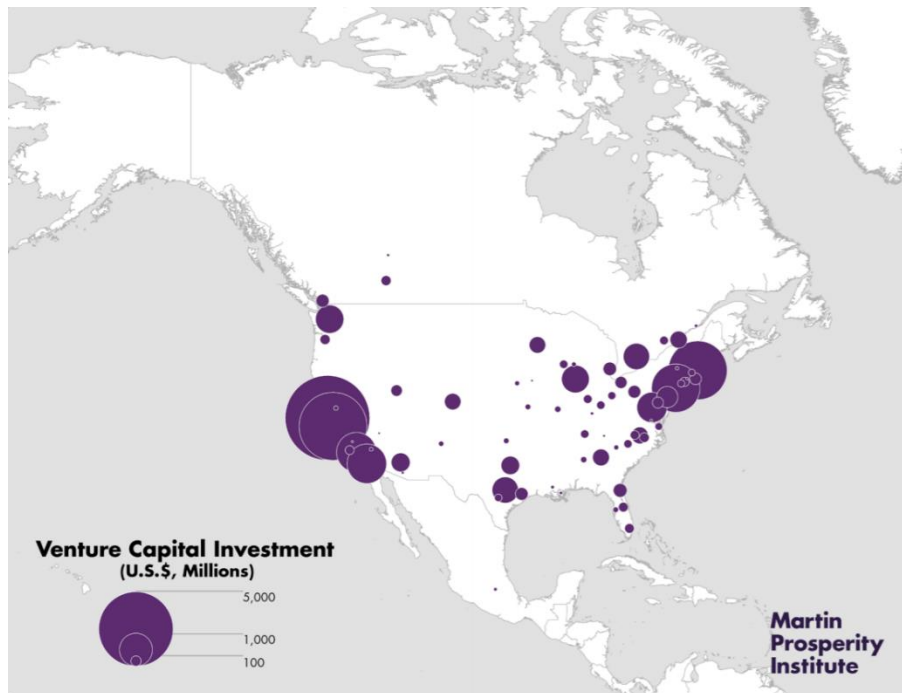# Appendix 3: Geographical Venture Capital Investment Distribution in 2012

Figure A3-1: Geographical VC Investment Distribution in U.S. Metropolitan Areas.
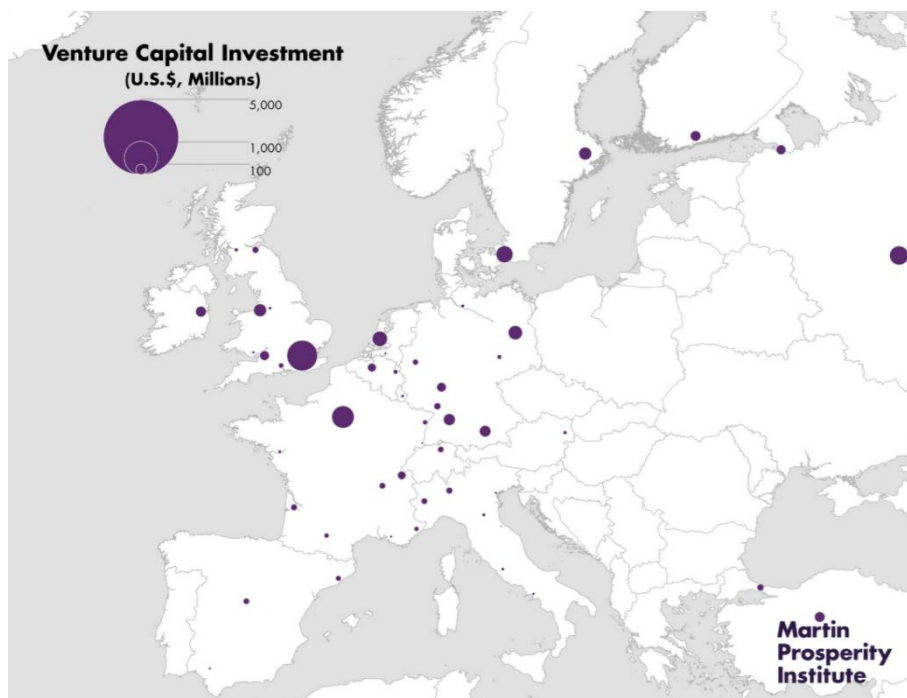*Source: Florida & King (2016, p. 18).*

Figure A3-2: Geographical VC Investment Distribution in European Metropolitan Areas.
Source: Florida & King (2016, p. 23).

Appendix 4: Case Study Summaries of Second-Tier Entrepreneurial Ecosystems

Boise, Portland, and Kansas City (Mayer, 2011)

In her 2011 book, Heike Mayer analyzes the cases of Boise, Idaho; Portland, Oregon; and Kansas City, Missouri. She highlights several factors that have helped each of these regions develop into high-tech clusters (pp. 204-210). First, unlike the superstar areas, all three second-tier areas studied specialized in a particular subset of high-tech industries. Second, the regions' development was strongly influenced by anchor companies that drove talent employment, innovation engagement, market connectivity, and spin-off creation. They also provided business opportunities for local SMEs. Third, the process of spin-off creation was highlighted as entrepreneurs emerging from such processes largely stayed in the region. In addition, anchor firms gradually built relationships with local customers, suppliers, subcontractors, and research partners, which also became sources of innovation. In addition, regions gradually developed into sites for R&D activities, even if they were initially only production sites. Fourth, Mayer argues that the development of the respective high-tech industries took place without major public intervention, even if proactive public policies later became more important. Mayer points out that public policies varied because of the different political cultures in each region. Fifth, anchor firms evolved into "surrogate universities" (p. 205) in terms of attracting and retaining talent, R&D investment, and spin-off creation. Mayer also highlights that local universities gradually developed to become important partners for the anchor firms.

Chattanooga (Motoyama et al., 2016)

In 2016, a case study of Chattanooga (Tennessee) was published by Motoyama et al. In the case of Chattanooga, a historically entrepreneurial city, technological advancement in the form of a one-gigabit fiber optic internet service for residents and businesses was a catalyst for entrepreneurial activity. In the development of Chattanooga's EE, four groups were key, according to the authors. First, two philanthropic foundations, one of which was established by the family associated with an early entrepreneurial venture in Chattanooga, Coca Cola Bottling, and an Angel Investment Fund provided funding to support local entrepreneurship. Second, there were four major organizations that provided services in

Chattanooga's EE. These services included classes and mentoring for current and potential entrepreneurs, accelerator and incubator programs, low-cost legal services, co-working spaces, networking opportunities, and promoting inclusion of people who might feel excluded from local entrepreneurial processes. Third, public organizations, including the city-owned utility company and the semi-public enterprise center, and local government support for entrepreneurship, particularly the support of the mayor, proved essential to Chattanooga's EE development process and provided legitimacy to entrepreneurial efforts. Fourth, a public-private partnership established an innovation district to host startups, accelerators, and support organizations, to focus and connect Chattanooga's EE, and to foster innovation. Motoyama et al. emphasize that while each area has access to different resources, organizing and leveraging these resources is critical to developing a thriving EE.

Newton Falls and Geneva (Roundy, 2019)

Roundy (2019) describes the cases of Newton Falls (Ohio) and Geneva (Ohio). He highlights that despite the small populations in both cities (less than 10,000), entrepreneurial activity is pervasive and diverse in terms of industry, business model, and type of activity. Given that both cities are at the lower end of the small-town spectrum, yet have an abundance of entrepreneurial activity, Roundy argues that the findings suggest that the definitions of "entrepreneurship" and "entrepreneurial ecosystem" commonly used in the academic literature are too narrow. Roundy argues that both cities exhibited both economic and community-based strategies that were driven by local governments to promote local entrepreneurship. In addition, there are forces that promote entrepreneurship, including community-building artifacts and activities, as well as entrepreneurship as an economic necessity due to the rust belt dynamics seen in both Newton Falls and Geneva. A sense of community also directly impacts local economic interactions. However, there are also forces that hinder entrepreneurship. These include economic challenges resulting from the decline of the few industries in which the cities have invested, negative economic spillover effects due to interdependence among different types of businesses, brain drain, and a self-reinforcing negative feedback loop in which declining taxes discourage local development and reduce the attractiveness of place, leading to a further decline in the tax base. Citing Rosenthal and Ross (2010), Roundy also mentions that a greater number of vacant properties leads to urban blight, making the area less attractive to entrepreneurs, new businesses, and potential customers. Roundy concludes that the web of connections

among actors within the local ecosystem and community is particularly important in small towns, and that a market logic and a community logic shape the local EE.

Calgary and Waterloo (Spigel, 2017)

By analyzing and comparing EEs in Waterloo, Ontario, and Calgary, Alberta, Spigel (2017) argues that their different configurations affect their respective internal entrepreneurial processes. Calgary's EE emerged from the energy sector and related financial and support services, with many startups focused on, but not limited to, the energy industry, which is a large local market. In addition, the outsourcing activities of large companies in the sector are creating entrepreneurial opportunities. It is also argued that the entrepreneurial culture in Calgary is primarily focused on wealth creation, driven by the culture of the oil and gas industry. However, this culture presents a challenge for local ventures, as they cannot compete with larger companies in terms of salaries and benefits, making it difficult to attract qualified workers. In addition, networking with other entrepreneurs outside of the oil and gas industry is less desirable for Calgary entrepreneurs than networking within the industry, limiting the effectiveness of entrepreneurs' social networks. This, in turn, limits the effectiveness of the EE's support programs and policies. The sector-specific focus of the EE also has implications for the availability of financial capital. While there are a significant number of investors, they tend to be sector-specific, which limits investment in ventures outside the sector and thus limits access to capital for some entrepreneurs. Calgary's EE primarily attracts companies in the oil and gas industry for the reasons mentioned above. Waterloo, on the other hand, is developing around anchor institutions in the technology sector, including the local university with strengths in computer science and engineering, and has supportive relationships. Waterloo's EE includes several supporting organizations and has historically been a supporter of spin-off activity. In contrast to Calgary's monetary drive, entrepreneurs in Waterloo also enjoy social prestige, and local social networks are dense. Successful business people actively participate in networking activities, facilitating mentorship and receive advice. Waterloo's culture also facilitates the attraction of skilled workers. The characteristics of Waterloo's EE "[...] promote a particular vision of high-growth, technology-led firms [...]" and help to "[...] reproduce the cultural importance of technology entrepreneurship within the region's ecosystem by celebrating successful entrepreneurs and normalizing particular practices [...]" (p. 64). The cases of Calgary and Waterloo show that the configuration of factors

influencing the EE can vary from region to region and affect how resources are sourced from each environment (see Figure A4-1). This underscores the need for a specific, rather than a generalist, approach to EE development.
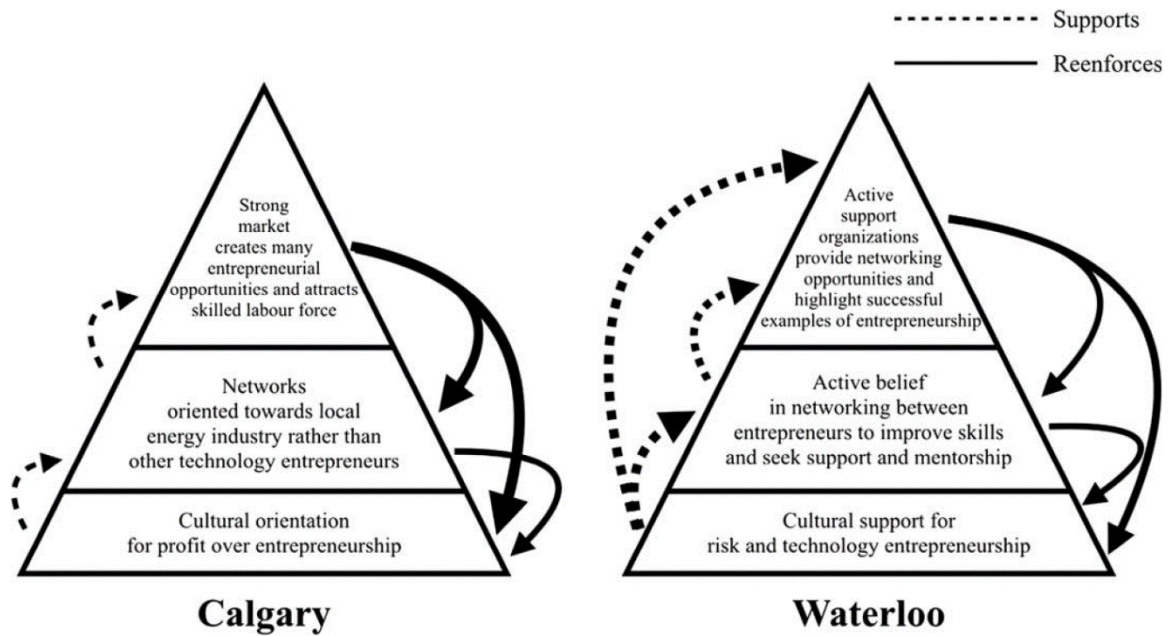

Figure A4-1: Relationship among Ecosystem Attributes in Calgary and Waterloo.
Source: Spigel (2017, p. 66).

Appendix 5: REDI Ranking and Scores of the 125 European Union Regions

Rank	Code	Region	REDI
1	DK01	Hovedstaden	82.2
2	UKI	London	79.9
3	FR1	Île de France	79.3
4	SE11	Stockholm	73.8
5	SE12	Östra Mellansverige	72.7
6	SE23	Vastsverige	72.2
7-8	IE02	Southern and Eastern	72.0
7-8	DK05	Nordjylland	72.0
9	UKJ	South East (UK)	69.5
10	SE22	Sydsverige	67.3
11	DE3	Berlin	67.2
12	DK03	Syddanmark	65.1
13	BE1	Région de Bruxelles-Capitale	64.9
14	SE33	Övre Norrland	64.7
15	NL3	West-Nederland	64.4
16	DK04	Midtjylland	64.3
17	FR7	Centre-Est (FR)	64.2
18	IE01	Border. Midland and Western	63.4
19	DE7	Hessen	63.3
20	FI1B	Helsinki-Uusimaa	62.2
21	BE2	Vlaams Gewest	62.1
22	UKH	East of England	61.5
23-25	DK02	Sjalland	60.7
23-25	UKK	South West (UK)	60.7
23-25	AT1	Ostösterreich	60.7
26	BE3	Région wallonne	60.1
27	FR8	Méditerranée	59.4
28-29	UKD	North West (UK)	59.0
28-29	UKM	Scotland	59.0
30-31	FI1C	Etelä-Suomi	58.9
30-31	FR6	Sud-Ouest (FR)	58.9
32	FI19	Länsi-Suomi	58.7
33	UKG	West Midlands (UK)	58.6
34	DE1	Baden-Württemberg	58.1
35	UKN	Northern Ireland (UK)	58.0
36	SE31	Norra Mellansverige	57.7
37	DE2	Bayern	57.3
38	NL4	Zuid-Nederland	57.0
39	NL2	Oost-Nederland	56.5
40	UKE	Yorkshire and The Humber	56.4
41	DEB	Rheinland-Pfalz	56.2

Rank	Code	Region	REDI
42	UKF	East Midlands (UK)	55.3
43	DEA	Nordrhein-Westfalen	55.0
44	DEC	Saarland	54.9
45-46	UKL	Wales	54.7
45-46	ES30	Comunidad de Madrid	54.7
47	DE6	Hamburg	54.3
48	AT2	Südösterreich	52.0
49	FR5	Ouest (FR)	51.8
50	DE9	Niedersachsen	51.6
51	SI02	Zahodna Slovenija	51.3
52	FI1D	Pohjois- ja Ita-Suomi	51.2
53	NL1	Noord-Nederland	51.1
54	FR2	Bassin Parisien	50.9
55	AT3	Westösterreich	50.3
56	DED	Sachsen	50.0
57	SE21	Smaland med öarna	49.9
58	FR4	Est (FR)	49.7
59	UKC	North East (UK)	48.9
60	FR3	Nord - Pas-de-Calais	48.8
61	DE4	Brandenburg	48.5
62	DE5	Bremen	48.4
63	SE32	Mellersta Norrland	48.2
64	EE	Estonia	45.9
65	ES21	País Vasco	45.6
66	SI01	Vzhodna Slovenija	45.3
67	PT17	Lisboa	44.6
68	SK01	Bratislavsky kraj	44.0
69	DEF	Schleswig-Holstein	43.6
70-72	ES12	Principado de Asturias	42.3
70-72	ES51	Cataluna	42.3
70-72	DEE	Sachsen-Anhalt	41.3
73	ITC	Nord-Ovest	40.4
74	ES22	Comunidad Foral de Navarra	39.0
75	ES52	Comunidad Valenciana	38.1
76	ES53	Illes Balears	37.7
77	ES23	La Rioja	37.6
78	DEG	Thüringen	37.2
79	ES61	Andalucía	37.1
80	CZ	Czech Republic	37.0
81-82	ITI	Centro (IT)	36.9
81-82	ES11	Galicia	36.9

Rank	Code	Region	REDI
83	ES41	Castilla y León	36.8
84	ES62	Región de Murcia	36.7
85	ES13	Cantabria	36.5
86-88	ITH	Nord-Est	36.1
86-88	PL5	Region Poludniowo-Zachodni	36.1
86-88	PL1	Region Centralny	36.1
89	DE8	Mecklenburg-Vorpommern	35.6
90	ES70	Canarias (ES)	35.5
91	LT	Lithuania	35.2
92	PL2	Region Poludniowy	34.1
93	LV	Latvia	33.8
94	PL6	Region Pólnocny	33.2
95	ES24	Aragón	32.6
96	PL4	Region Pólnocno-Zachodni	32.3
97	ES42	Castilla-la Mancha	32.1
98	HR03	Jadranska Hrvatska (Adriatic Croatia)	32.0
99	HU10	Közép-Magyarország	31.4
100	EL3	Attiki	31.3
101	PT15	Algarve	30.9
102	ES43	Extremadura	30.3
103	HR04	Kontinentalna Hrvatska (Continental Croatia)	29.9
104	PT18	Alentejo	29.4
105-106	PL3	Region Wschodni	29.2
105-106	PT11	Norte	29.2
107-108	PT16	Centro (PT)	27.6
107-108	ITG	Isole	27.6
109	ITF	Sud	27.3
110	SK02	Západné Slovensko	25.8
111	SK03	Stredné Slovensko	24.9
112	SK04	Vychodné Slovensko	24.5
113	HU23	Dél-Dunántúl	23.8
114	EL1	Voreia Ellada	22.7
115	HU31	Észak-Magyarország	22.4
116	RO3	Macroregiunea trei	22.1
117	HU21	Közép-Dunántúl	22.0
118	HU22	Nyugat-Dunántúl	21.5
119-120	HU32	Észak-Alföld	21.4
119-120	EL4	Nisia Aigaiou. Kriti	21.4
121	HU33	Dél-Alföld	21.0
122	RO4	Macroregiunea patru	19.7
123	EL2	Kentriki Ellada	19.5
124-125	RO1	Macroregiunea unu	19.4
124-125	RO2	Macroregiunea doi	18.4

Figure A5-1: REDI Ranking and Scores of the 125 EU Regions.
Source: Szerb et al. (2015, p. 14).

Appendix 6: Detailed Research Method

This appendix describes in more detail the research method used to analyze Uppsala and Galway. First, the research objectives are defined. Then, the selection of the research method and the sampling procedure are described. After an overview of the research instrument's design, data collection preparation and execution, data preparation and coding, and the analysis and interpretation approach are explained.

Research Goals

To fill the research gap on EEs in second-tier European regions, a comparative analysis of two EEs, Uppsala and Galway, was conducted. The goal of the analysis was to:

- determine the roots of the two EEs that caused their emergence.
- identify the conditions that enabled the growth of the two EEs.
- determine the main actors that influenced the birth of the two EEs.
- determine the key actors that drove the growth of the two EEs.
- determine the importance of policies and government interventions in the birth and growth of the two EEs.
- determine the similarities and differences in the development processes of the two EEs.

Selection of Research Method

To achieve the research objectives, an inductive research approach was adopted. This approach consists of guiding research questions that determine data collection and analysis (Roundy, 2019). Because there is little research on EEs in second-tier European regions (Roundy, 2019), an inductive, theory-building approach is more appropriate than a deductive, hypothesis-driven, theory-testing approach (Locke, 2007). As Edmondson and McManus note, inductive theory-building involves "[...] understanding how a process unfolds, developing insight about a novel or unusual phenomenon, digging into a paradox, and explaining the occurrence of a surprising event" (2007, pp. 1161-1162). Eisenhardt et al. (2016) share a similar understanding of the value of inductive methods, stating that such

methods "[...] excel in situations for which there is limited theory and on problems without clear answers" (p. 1113). Given the counterintuitive nature of thriving EEs in second-tier regions despite the phenomenon of innovation polarization, an inductive approach was appropriate. Moreover, the emergence and growth of an EE in a second-tier European region is a complex process with numerous variables that need to be accounted for, such as time, social interactions, and feedback loops (Roundy, 2019); this makes it difficult to hypothesize about its functions before observing them (Fischer & Maggetti, 2017). While building an effective theoretical framework requires alternating between inductive theory building and deductive theory testing strategies (Edmondson & McManus, 2007), the goal of this dissertation was not to develop a theoretical framework, but rather to outline policy approaches that have worked in establishing and growing EEs in second-tier European regions, while also considering the sometimes limiting nature of spatial differences. However, some scholars argue that comparative case studies offer a degree of generalizability despite a small sample size (e.g., Roundy, 2019; Eisenhardt & Graebner, 2007).

The sampling procedure is described in the following section. In addition, data obtained through secondary research supplemented the primary data generated. Therefore, the data sets used to analyze the two EEs included both primary and secondary data.

Sampling

According to Isenberg (2011b), there are various actors within an EE including, among others, the government, founders, investors, support organizations, educational institutions, and multinational enterprises. Therefore, purposive sampling, a form of non-probability sampling, was chosen as the sampling method. Given the research objectives and inductive research approach, the sampling procedure did not aim to be statistically significant, but rather to select information-rich cases to gain insight into the nature, processes, and structure of EEs in Uppsala and Galway (Patton, 2005). Therefore, interviewees were purposefully selected to include different perspectives, knowledge, and experiences of the aforementioned stakeholders (Palinkas et al., 2015). This allowed for an in-depth understanding of the two EEs. While purposive sampling would be considered biased in statistical sampling, purposeful and intentional selection of interviewees is a strength in qualitative sampling (Patton, 2005). The interviewees were identified through

a combination of secondary data highlighting key players within the EEs and snowballing (see, e.g., Biernacki & Waldorf, 1981).

In qualitative research, sample size depends on the specific context of the research project (Boddy, 2016). The predominant determinant of sample size in qualitative research is information saturation, as noted by several scholars (e.g., Malterud et al., 2016; Fusch & Ness, 2015; Morse, 1995). According to Malterud et al. (2016), each interview can have different levels of information richness depending on the research objectives. In this regard, a higher level of information richness is associated with a smaller sample size

Region	Category	Organisation	Date	Duration	ID
Uppsala	Government	City of Uppsala	5 June	1h	UG1
	Scholar	Uppsala University	9 June	45min	UU1
	Support, Investor	STUNS, local early-stage investment firm	9 June	1h	US1
	Entrepreneur	Local start-up in AI	11 June	30min	UE1
	Support	STUNS	11 June	1h	US2
	Support	STUNS Life Science	18 June	1h 10min	US3
	Entrepreneur	Local life science start-up	22 June	1h	UE2
	Investor	Connect Uppsala	25 June	30min	UI1
	Entrepreneur	Stockholm-based life science start-up	26 June	40min	UE3
Galway	Support	Galway Technology Centre	17 June	50min	GS1
	Scholar	NUI Galway	19 June	40min	GU1
	Investor, Support	Galway City Innovation District, local early-stage investment firm	19 June	1h 15min	GI1
	Government	Galway City Council	23 June	35min	GG1
	Entrepreneur	Local start-up in data analytics	30 June	45min	GE1

Table A6-1: Final Sampling Table of Interviewees.

(Malterud et al., 2016). The sample size for this dissertation was determined by the time available for the research, the cross-case nature of the research, the number of key actors within the EEs, and the information-richness of each interview. Because some determinants of information saturation could not be determined a priori, it was not possible to determine a final number of interviews to be conducted at the beginning of the research process. was not possible. As Malterud et al. (2016) mention, a first approximation of the sample size is necessary for planning. However, the final sample size needs to be continuously evaluated throughout the research process and is based on the information power of the interviews conducted in relation to the research objectives (Malterud et al., 2016). Therefore, the goal was to conduct at least five interviews in each of the two regional EEs to capture the knowledge, perspectives, and experiences of key stakeholders within the EEs. However, the new knowledge that could be expected from additional interviews and whether the expected additional information would contribute meaningfully to answering the research question were the determining factors in deciding whether the numerical input of participants was large enough to achieve richness and depth of analysis (Malterud et al., 2016). The final sample table can be found in Table A6-1.

Design of Research Instrument

To collect data on the two EEs in Uppsala and Galway, semi-structured interviews were conducted with relevant stakeholders within these EEs. While a semi-structured interview is more conversational, the interviewer uses a list of predetermined questions that nevertheless allows for topics to be explored in greater depth if the interviewer deems it important (Longhurst, 2003). Conversations are therefore free to vary and tend to differ considerably between participants (Fylan, 2005). A semi-structured interview allows "[...] the researcher to prompt and probe deeper into [a] given situation" (Kajornboon, 2005, p. 6), while at the same time comparing responses from different interviewees.

Although there is considerable variation among semi-structured interviews depending on the scope of the research, the complexity of the questions posed, and the participants, such interviews are well suited to elicit reasons rather than quantities, allow for exploration of contradictions, and are appropriate for discussion of sensitive topics (Fylan, 2005). However, as Leech (2002) notes, the preparation, process, and types of questions asked

are critical to gaining valuable information and achieving research objectives. Recommendations include (Leech, 2002; Longhurst, 2003):

- acquiring knowledge on the topic beforehand and preparing thoroughly,
- making interviewees feel comfortable and giving them time to talk and explain,
- restating what respondents said to ensure comprehension,
- starting with questions interviewees likely feel comfortable with and asking difficult or sensitive questions during the second half of the interview,
- asking "grand tour questions" (Spradley, 1979) to trigger focused elaboration,
- asking example questions to extract detailed information on specific issues, and
- using prompts to get more detailed answers.

The semi-structured interview guide, which includes the recommendations listed above, can be found in Appendix 9.

Preparation and Execution of Data Collection

To prepare the semi-structured interviews, three different research phases were defined. The literature review in Chapter 2, which is the first phase of the research, served as preparation for the semi-structured interviews in the second phase of the research. The third phase then consisted of combining the findings from the first two phases to derive policy implications for second-tier European regions. An illustration of the phases can be seen in Figure A6-1.

Interviews for this dissertation were conducted via video or phone call due to travel restrictions because of the Covid-19 pandemic. In addition, the interviews were supplemented in the second phase by an analysis of secondary sources on key events that influenced the birth and growth of the two EEs in Uppsala and Galway.

All interviews were recorded and transcribed. Recording interviews allows the researcher to focus on the interview rather than being distracted by extensive note taking (Longhurst, 2003). It is recommended that transcription be done soon after the interview to recall the mood of the conversation; notes on the general tone of the interview, key themes, and surprising statements can further aid analysis (Longhurst, 2003). Verbatim transcription of interviews has advantages and disadvantages (for an analysis, see Halcomb & Davidson,

2006). Specifically, if the researcher lacks time, Halcomb and Davidson (2006) recommend a more time-efficient methodology consisting of reflective journaling and iterative modification of field notes and observations. However, because the importance of transcription has been emphasized by several researchers (e.g., McLellan et al., 2003; Wellard & McKenna, 2001; Matheson, 2007) and to allow for effective data analysis, verbal transcripts were created (see Appendix 11). However, due to the limitations of video and telephone interviews in terms of nonverbal communication observations, the ability to create such field notes was limited. All interviews were recorded and transcribed. Recording interviews allows the researcher to focus on the interview rather than being distracted by extensive note taking (Longhurst, 2003). It is recommended that transcription be done soon after the interview to recall the mood of the conversation; notes on the general tone of the interview, key themes, and surprising statements can further aid analysis (Longhurst, 2003). Verbatim transcription of interviews has advantages and disadvantages (for an analysis, see Halcomb & Davidson, 2006). Specifically, if the researcher lacks time, Halcomb and Davidson (2006) recommend a more time-efficient methodology consisting of reflective journaling and iterative modification of field notes and observations. However, because the importance of transcription has been emphasized by several researchers (e.g., McLellan et al., 2003; Wellard & McKenna, 2001; Matheson, 2007) and to allow for effective data analysis, verbal transcripts were created (see Appendix 11). However, due to the limitations of video and telephone interviews in terms

	Research Phase I	Research Phase II	Research Phase III
Aim	Determine actors and general success factors of EEs in second-tier regions	Determine success factors of two European second-tier regions with flourishing EEs	Derive policy implications relevant for establishing EEs in European second-tier regions
Secondary	Databases, scientific journals, practical journals, scientific books, case studies, news sources	Press releases, press articles, website announcements etc. on key events impacting the local EE	Analysing data from phase I and phase II
Interviews		Scholars	
		Support Organisations	
		Founders	
		Investors	
		Government Representatives	

Figure A6-1: Research Phases.
Source: own illustration.

of nonverbal communication observations, the ability to create such field notes was limited.

Editing and Coding of Data

Because there are several transcription systems used in scholarly research (for an overview, see Kowal & O'Connell, 2004), basic decisions must be made about which transcription system to use. The transcription system used for the interviews in this dissertation is defined as follows, in accordance with Kowal and O'Connell (2004, pp. 249-250) and given the limitations associated with video and telephone interviews:

- Verbal features are transcribed and standard orthography, i.e., based on the norms of the written language, is used.
- No symbols are used, paralinguistic features are highlighted if they seem to be relevant to understanding a specific answer.
- The transcription happens electronically.
- In case a specific answer cannot be understood by a reader otherwise, the context of the answer that has not been linguistically elaborated is described.

The coding of the interviews followed the suggestions of Schmidt (2004, pp. 254-257). First, the common themes discussed in the various interviews were identified and summarized in an analytical guide (see Appendix 10). The themes were determined iteratively and came from the semi-structured interview guide as well as from the interviews themselves. The interviews were then coded according to the guide. Based on the coded interviews and by grouping the quotes by their codes, the relevance of each theme was determined. Based on the relevance of the themes, each interview was iteratively analyzed again in depth to make sense of the various interviews and conclude as to why each of the two regions studied achieved the development of a thriving EE.

Some researchers used timelines to analyze relevant innovation trajectories of specific EEs (e.g., Ryan et al., 2020a; Motoyama et al., 2016). This approach was replicated to highlight the dynamics of the EEs analyzed. Sequencing secondary data points and adding a temporal

layer to the interview coding process enabled both the creation and subsequent analysis and interpretation of timelines and corresponding innovation trajectories.

Data Analysis and Interpretation

Following the analysis of methods used by Welch et al. (2011) to build theory using case studies, interpretive sensemaking was used to analyze the two EEs in Uppsala and Galway. Interpretive sensemaking avoids generalizations and emphasizes the importance of individual context. Researchers using interpretive sensemaking consider themselves part of the contextual analysis, making the analysis subjective. However, this is seen as a strength, as ignoring the context of a particular case, and establishing cause-and-effect relationships is seen as too simplistic (Stake, 1995, pp. 39-40; Stake, 2005, p. 449; Welch et al., 2011). The so-called "thick description," that is, the "[...] appreciation of how the social context imbues human interaction with meaning [...]" (Welch et al., 2011, p. 747), is considered a particular strength of interpretive sensemaking. As highlighted earlier, several components, especially the preparation and execution of data collection, as well as the editing and coding of the data, are based on decisions made by the researcher and are therefore at least partly subjective in nature. This further underscores the choice of interpretive sensemaking, as it does not claim to be objective or universally valid, and does not deny the possibility of different results due to differences in the researcher's decisions.

By sequencing relevant innovation trajectories, a process-based interpretation and explanation of the evolutionary dynamics of the two EEs was possible (Ryan et al., 2020a). Successive iterations between theory and data are proposed to refine the analysis (Ryan & Bernard, 2000, p. 783). By combining the viewpoints and perspectives of various interviewees, as well as data obtained from secondary sources, a "chain of evidence and narrative accounts" (Ryan et al., 2020a, p. 7) emerged that depicts the evolutionary processes of the two EEs in Uppsala and Galway.

Finally, by comparing Uppsala and Galway, similarities and differences in the contexts, developmental dynamics, and composition of the two EEs could be derived. While it is possible to extract some generalizable prerequisites, strategies, or processes (Roundy, 2019), the limited sample size of the EEs studied limits such generalizations. Therefore,

interpretation of the data had to consider the spatial context. Although the results, particularly in terms of policy choices or government interventions, may provide direction and inspiration for other second-tier regions in Europe, the author of this dissertation does not claim that policies or interventions based on the results will work with certainty in other contexts. This is a feature of the interpretive sensemaking approach, which involves particularization rather than generalization (Welch et al., 2011). Figure A6-2 summarizes the data sources used and their analytical use for this dissertation.
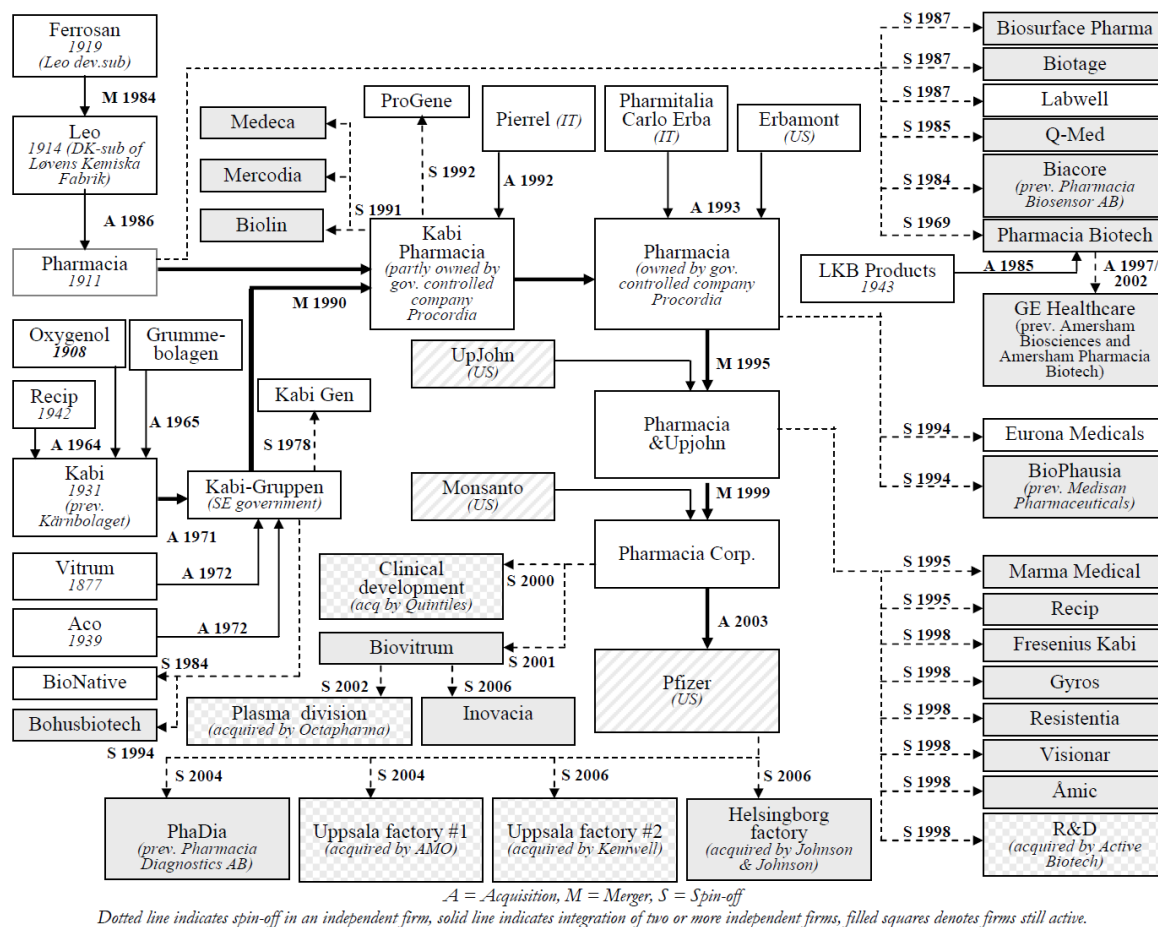
Appendix 7: Swedish Genealogy of Pharmacia

Figure A7-1: Swedish Genealogy of Pharmacia.
Source: Dahlgren & Valentin (2007, p. 8).

Appendix 8: Data Structure of Ecosystem Analysis

Uppsala's Entrepreneurial Ecosystem			
Phase: Birth			
EE Domain	**Sub-Domain**	**Theme**	**Exemplary Quotes**
Culture	Societal Norms	Uppsala's reputation as an academic town	*"I mean, at the heart of this is that this is the biggest university in Scandinavia, and the oldest, and it dominates the city completely." (Quote ID: UE2:1)*
Human Capital	Educational Institutions	Research breakthrough in life sciences at Uppsala University	*"And then you have the breakthrough science that was made within then Pharmacia in the 1920s, which, there were some really prominent professors who more or less refused to move. So, that is why the life science sector moved to Uppsala." (Quote ID: US1:1)*
		Relocation of Pharmacia motivated by university-industry R&D collaboration	*"The other part I think is [...], since Pharmacia moved to Uppsala in 1951, [...] they did that because they wanted to be close to the university." (Quote ID: US3:1)*
		Professor's privilege as hybrid entrepreneurship enablement	*"Very often researchers stay at the university, and they do these things in parallel to their research activities. So, we could also have hybrids there. They are spinning off, or they are commercialising, but the main people stay at the university." (Quote ID: UU1:1)* *"[...] with the professor's privilege, there is a situation where researchers actually, they look for opportunities to either sell their ideas or sell a company or something else, because they can earn from it." (Quote ID: US3:2)*
		University-industry R&D collaboration attracting MNEs	*"So, for a long time, Pharmacia was [...] the big company, and even when they kind of broke down into smaller pieces, there has still been a lot of activity in between the industry and the university itself." (Quote ID: US3:3)* *"Danaher bought this site. They say that they want to be here because they work really well with the university. You get all the people you need." (Quote ID: UG1:1)* *"[...] one player that comes to mind, which is a big player, is GE Healthcare [...]. They seem to be involved in [...] many connections to the university, to research." (Quote ID: UU1:2)*
	Labor	Spin-off activities by former MNE employees	*"[...] we have seen a lot of spin-offs from the Pharmacia and the GE sphere, so there is a lot of more senior people here in Uppsala right now that have been part of spin-offs and have been part of this sphere as well that are now involved in different businesses, and some of them are also investors now [...]." (Quote ID: UI1:1)*

EE Domain	Sub-Domain	Theme	Exemplary Quotes
Markets	Networks	Dissolvement of Pharmacia attracts MNEs	*"Well, we have this, in Uppsala, after the Pharmacia, it was kind of a trust crisis for a while, but then people found other jobs and then GE, General Electric started to move in, and kind of everyone was employed for a while by GE." (Quote ID: UE2:2)*

Phase: Growth			
EE Domain	**Sub-Domain**	**Theme**	**Exemplary Quotes**
Markets	Networks	Uppsala's life sciences cluster continues to grow	*"So, and it [Pharmacia] was shut down maybe 15 years ago, I do not know exactly when, 10 to 15 years. So, since then, today, there are 15,000 people working in life science companies in Uppsala, and back then it was 7,000, so it has exploded." (Quote ID: UE2:3)* *"Within life science, Uppsala is famous I should say. So, Uppsala is one of the major life science cities in Sweden." (Quote ID: US2:1)*
Policy	Leadership	Positive sentiment towards entrepreneurial activity among government officials	*"I mean the royal family, it sounds silly, but the Princess Victoria and Prince Daniel, they are really important, because he really is an entrepreneur and he goes to schools to talk, and he wants to meet companies. When he was in Uppsala the last time, he went around to see companies. That is also something that has made it cool to be an entrepreneur now." (Quote ID: UG1:2)*
	Government	Significant public investment in entrepreneurial support infrastructure	*"The weakness is that, since it is so much funded by us [City of Uppsala] and the government, the weakness is that they [entrepreneurs and support organisations] are competing with each other [for funding] instead of getting together and figuring out how to get some private money into the system." (Quote ID: UG1:3)*
Culture	Societal Norms	Close collaboration between relevant actors within Uppsala's EE	*"What is special is that we work very closely together. That is one of the strengths being such a relatively small city, is that we can work closely together." (Quote ID: US2:2)* *"We are, like not taking pride maybe, that is the wrong word, but we are really concerned about not competing with each other. So, we are having very close dialogues." (Quote ID: US2:3)*
	Success Stories	Successful start-ups from Uppsala inspire nascent entrepreneurs	*"I mean there are role models that have been to the university or the ones that were born in Uppsala, like Niklas Adalberth who started Klarna. I mean he is a role model to a lot of kids and students at Uppsala University today." (Quote ID: UG1:5)* *"[...] these serial entrepreneurs, at least the successful ones have, they give you confidence I should say." (Quote ID: UE2:4)*
Human Capital	Educational Institutions	University-industry R&D collaboration as an important contributor to Uppsala's attractiveness	*"[...] I think we also put ourselves great in a position that people know that the university is producing a lot of great science and great, especially in the life science area and in the green tech area, we have great innovations coming, and in the material sciences, materials are coming up." (Quote ID: UI1:2)* *"[...] it is called STUNS Life Sciences now, that was something, and everything was about collaboration between the universities, and to get more companies. We needed*

EE Domain	Sub-Domain	Theme	Exemplary Quotes
			more ideas to become commercialised and to become companies." (Quote ID: UG1:4)
	Labor	Availability of well-educated human capital	"I think that, that seems to have this huge inflow of talent that are students, we will see them sort of endeavouring within the field of entrepreneurship." (Quote ID: US1:2)
			"And, for them [entrepreneurs], I think, I think it is mainly because we have two such strong universities, that is one part, like we have many students per capita. When you have a lot of knowledge in the city that actually leads to entrepreneurs and an entrepreneurial spirit, kind of." (Quote ID: US2:4)
Supports	Infrastructure	Proximity to Stockholm and Arlanda Airport contributes to Uppsala's attractiveness	"I mean of course it [a strength of Uppsala] is the proximity to Stockholm and the proximity to an international airport." (ID: US1:3)
			"And of course, it [Uppsala] is close to Arlanda, which is the biggest airport of Sweden, it is 30 minutes away, and close to Stockholm. So, we have our own identity, but it is close." (Quote ID: UE2:5)
			"They [entrepreneurs] talk about going to Stockholm is cool, but Stockholm also is a lot more expensive to rent offices, and salaries are higher. Our airport is also closer to Uppsala geographically than to Stockholm [...]." (Quote ID: UG1:6)

Phase: Sustainment			
EE Domain	**Sub-Domain**	**Theme**	**Exemplary Quotes**
Markets	Networks	Gradual diversification of Uppsala's EE	"But if you are only looking into your own sector, you will probably do the same thing that you did yesterday. This is also something we try to do, we try to make sure we are bringing good best practices from other industries into the life science industry, to be able to develop them and grow them and so on." (Quote ID: US3:4)
			"Then in later years it has expanded into multiple other areas, such as ICT, as we see in many other university towns." (Quote ID: US1:4)
Culture	Societal Norms	Pay-It-Forward type culture fosters indigenous start-ups	"I think Uppsala is different in one way. It has kind of a Pay-It-Forward culture. So, we have a bit of this giving back to others, like this, we have what we call the Pharmacia generation, those people are now in their 80s, so they are very old, but they sort of have always looked after the talent that is sort of succeeding them." (Quote ID: US1:5)
			"[...] in Stockholm, there is much more competitiveness. I think, in Uppsala, there is like a tradition of trying to help each other out instead of competing with each other." (Quote ID: UE1:1)
			"[...] we have seen a lot of spin-offs from the Pharmacia and the GE sphere, so there is a lot of more senior people here in Uppsala right now that have been part of spin-offs and have been part of this sphere as well that are now involved in different businesses, and some of them are also investors now in our network as well." (Quote ID: UI1:3)

Finance	Financial Capital	Lack of growth capital in Uppsala	*"But to get to VC capital, the ones that do series A to scale up and all of that. Then you have to, there is nothing of that in Uppsala, then you have to go to Stockholm or other cities [...]." (Quote ID: UE2:6)*
			"We have not so big muscles as we would like to have here in Uppsala, so mainly our focus is on seed capital rounds, so the first rounds. We would like to have, like, bigger VC firms or bigger family offices here, we really do not have that. So, when they are coming back for the third or fourth round, or maybe an A round or something like that, we need to send them to Stockholm or guide them to where the bigger money is." (Quote ID: UI1:4)
		Possibility of an early IPO at a small-cap venture exchange called First North	*"Sweden has the world's best and most advanced way of doing IPOs for very small companies, initial public offerings. So, if you go public as a small company, it is not possible in that many countries." (Quote ID: UE2:7)*
		Lack of growth capital leads to relocation of indigenous start-ups in the scale-up phase	*"Because when they have done Spotify or Skype or Klarna, it has always been moving to Stockholm or moving abroad [...]." (Quote ID: UG1:7)*
			"So, this is a problem. So, we are really working on how to get capital from outside into Uppsala without companies moving out from here to get their additional funding in the later stages. So, we do not have a lot of scale-up funding here, that is too bad." (Quote ID: UI1:5)
			"No, I think that [lack of growth capital] is the biggest thing that we all need to work on; to be able to provide so much support for the companies that they like to stay here and be big here. So, we can see a lot of great start-ups going to Stockholm and other bigger cities [...]." (Quote ID: UI1:6)
		Lack of growth capital leads to increased acquisition activities by local MNE subsidiaries	*"So, in general we are, you know, we get the growth stage, but we do not get the later stages of the companies. [...], it is also because of them getting bought by international players [...]." (Quote ID: US1:6)*
			"I would like to have more companies to grow and become bigger, and settle themselves and start, for instance, you know, manufacturing and such things. And, to backtrack is also kind of a bit tricky, because there are so many mergers and acquisitions." (Quote ID: US3:5)

Galway's Entrepreneurial Ecosystem			
Phase: Birth			
EE Domain	**Sub-Domain**	**Theme**	**Exemplary Quotes**
Policy	Government	Monetary incentives to attract MNEs	*"[...] I think the cluster kind of did happen, like, as you said, from the outside. It is kind of organic but not purely organic, because it did happen from a structured kind of policy, top-down policy of attracting FDI. And then, it just so happened, the way things happened [...]." (Quote ID: GU1:1)*

			"[...] it kind of happened, [...] you know, as a by-product to a structured policy, and a planned policy of attracting FDI, the cluster kind of happened out of that [...]." (Quote ID: GU1:2)
		Business-friendly regulatory environment	*"[...] Enterprise Ireland, IDA, all the benefits, the bureaucracy, the tax, I mean it is all meant to allow people to do business and to make life simple. I mean, there is not anything more friendly than taxation in Ireland and everything else."* (Quote ID: GE1:1)
Human Capital	Educational Institutions	Local universities provide skilled human capital	*"A regional skills form was set up, so that is to have, to bridge the gap, working with the companies wherever the skill shortages are, sort of facilitating those discussions within the university and the development of programmes, [...] to ensure that the companies, when they are setting up, obviously that the programmes that they are running in the university are relevant, that the graduates coming out have the relevant skills for the companies to be able to employ them."* (Quote ID: GS1:1)
		R&D activities at local universities lead to spin-off activities by students and researchers	*"I think the MedTech ecosystem, or the medical device ecosystem is much more developed. And, I think the actors that were involved, the university was very involved, the multinational corporations were, you know, obviously they are the players where these people came from."* (Quote ID: GI1:1)
			"[...] so that centre [SFI Research Centre for Data Analytics at NUI Galway] has attracted a lot of PhD students from around the world that are specifically focusing on that, you know, on that area of like big data, data analytics, AI, and we are starting to see, over the last couple of years, a number of spin-out companies coming out of there." (Quote ID: GS1:2)
	Labor	R&D activities within local MNE subsidiaries lead to spin-off activities in related industries	*"And the people that do that research and development often are the ones who spin out and do their own products. And, in the MedTech, we have a cohort of people who all worked for big MNCs and have now spun out and have become serial entrepreneurs."* (Quote ID: GI1:2)
			"[...] they came out of these multinationals, they were ex-employees of those multinationals, and they were mainly in an R&D function. They set up companies, and then they sold them [...]." (Quote ID: GU1:3)
			"And then the universities themselves, you know, they obviously have a huge role in university spin-offs and IP, and you know, supporting companies that are coming out of there." (Quote ID: GS1:3)
Markets	Networks	Influx of MNEs from the MedTech field and their shift from production to R&D enable the development of an industry cluster in Galway	*"We are world-renowned as a MedTech cluster, and that, and I do not say that light-heartedly, that is what the industry is saying back to us, like it is not a lip statement."* (Quote ID: GG1:1)
			"[...] it is the movement away from, I think from the manufacturing to the R&D side that is critical for us and the city." (Quote ID: GG1:2)

		Phase: Growth	
EE Domain	**Sub-Domain**	**Theme**	**Exemplary Quotes**
Human Capital	Educational Institutions	University-industry R&D collaboration as an important contributor to Galway's attractiveness	*"So, the role that the university plays in that R&D and [not understandable] funds, it cannot be overstated." (Quote ID: GG1:3)* *"I think the university has become a key, kind of, player, or actor, through its research centres, because it has [was] awarded a good bit of funding, you know, that is dedicated to medical technology, like [the] CURAM centre there. That has developed the research infrastructure side of it a lot and developed a lot of ties with industry and things like that." (Quote ID: GU1:4)*
	Labor	Preparation of local human capital for the local industry by universities	*"We have many others, MathWorks, Ipswitch, we have loads of new companies come in, tech companies come in in the last three to four years, because they have seen how vibrant the ecosystem is, they have seen the lifestyle, they have seen that the talent is available, they have seen, like the access to the people in the universities, in the technical colleges to actually, and the willingness to actually help, to support them, to get them graduates that have the skills they need for their business." (Quote ID: GS1:6)*
Supports	Infrastructure & NGOs	Continuous development of support infrastructure by a group of volunteers and their non-governmental institutions	*"Yes, I would say it is this, you know, this group of volunteers, and without them it just would not exist." (Quote ID: GI1:3)* *"[...] really there is a couple of, I suppose, leaders and trailblazers around the city who have actually, all volunteers, I mean all working in their own roles, but all volunteers who came together to, sort of, trying to get this thing off the ground." (Quote ID: GS1:4)*
Policy	Government	Higher education funding as crucial investment in Galway's EE	*"So, they were aggressively recruiting people that were, with very nice salaries, even for PhD students, even for postdocs, even for researchers." (Quote ID: GE1:2)* *"So, we are very, very lucky in Galway, in the university [...], we have an insights centre for data analytics. So, that centre gets quite a lot of funding though Science Foundation Ireland, and through a number of other EU instruments. But they really have a very, you know, their focus is on data analytics and artificial intelligence, so that centre has attracted a lot of PhD students from around the world [...]." (Quote ID: GS1:5)*
		Phase: Sustainment	
EE Domain	**Sub-Domain**	**Theme**	**Exemplary Quotes**
Markets	Networks	Gradual diversification of Galway's EE	*"So, we have identified the media, ICT, we have identified food, and more so food added value, and we are looking at the marine sector as well." (Quote ID: GG1:4)* *"So, I think AI, data intelligence, big data, that is certainly one cluster. The other cluster I see is animation and gaming. We have been quite successful in attracting a number of both small and large multinational gaming companies here. And some*

			of them are providing shared services but some of them are actually developing and designing games, and with that, that has a number of indigenous gaming companies have sprung up as well." (Quote ID: GS1:7)
Culture	Success Stories	Local success stories inspire others to start entrepreneurial ventures	*"So, that has encouraged more I think than, you know, when they hear those success stories, and they have then the network locally that, [...] if you are setting up a company now in medical technology, you probably want one of those guys on your board, because they have such strong networks internationally as well as nationally." (Quote ID: GU1:5)* *"So, that really gave kind of other people the idea of like: 'Oh, maybe we could do this, too', you know." (Quote ID: GU1:6)*
	Societal Norms	Entrepreneurial recycling strengthens the local EE	*"So, that is one of the characteristics that now, you have this kind of entrepreneurial culture around now, and that is driven by a small number of serial entrepreneurs, really. [...] And [...] they are quite powerful now in the ecosystem, in the sense of being very domineering within the ecosystem, because there is probably just a handful of them. But they are continuously setting up new companies, so you get this kind of entrepreneurial recycling happening. And, they are not just setting up new companies, but they are also very involved, typically, in all the other start-ups that are happening, like being on the board of the management and things like that." (Quote ID: GU1:7)* *"And that is really driven or has been driven by key individuals that became serial entrepreneurs but are also now mentors and advisors and on board of all the other start-ups that are happening." (Quote ID: GU1:8)* *"So, a lot of the guys [...] who have run companies, sort of worked in the big multinationals, you know, spun out of those, done a start-up, and then done an exit, and then they came back and have done it again and again. So, that is working quite well." (Quote ID: GI1:4)*
Finance	Financial Capital	Lack of growth capital in Galway	*"I know a couple of companies now, who are good companies, have a good product, they have customers, and they have scale, but they just cannot find the next EUR 500,000." (Quote ID: GI1:5)* *"One other issue we did hear with regards to start-ups is the availability and attraction of financing can be challenging for the start-ups, for investments. They are not in London, or New York where a lot of the investment, sort of, opportunities are. So, you have to work harder to get on the radar of venture capitalists. There is not a lot of them walking around Galway every day that you might meet in your network, so you have to go out and find them, and that is an extra cost to a start-up in time and in resources, to get to the venture capitalists." (Quote ID: GG1:5)*

	Lack of growth capital leads to relocation of indigenous start-ups in the scale-up phase	*"But being in the U.S., in a place where there is big IT, big IT headquarters, that was the place where I should have been, but it was not possible with my funding to be in those places, so." (Quote ID: GE1:3)*
	Lack of growth capital leads to increased acquisition activities by local MNE subsidiaries	*"Like, you also have, you know, and it maybe a case of where businesses and start-ups happen is that they may get swallowed up by a multinational, because mergers and acquisitions seem to be a growth to the MedTech sector. So, that causes, you know, difficulties and opportunities at the same time for the organically growing indigenous businesses." (Quote ID: GG1:6)* *"Altocloud in America would not have been sold. You know, it is one of the macro issues that we do not have a functioning, the financial rainbow is missing colours. So, we do not have a functioning stock market, particularly what I would call venture money, we do not have it." (Quote ID: GI1:6)* *"[...] they look to grow, but, I suppose, most of the time they do sell then, they become acquired by a multinational at a late stage then, and at a stage where they might not even be selling the device on the marketplace, but they have gotten through clinical trials, they have gotten regulatory approval, and then they are kind of eaten up. But it is kind of the sector as well, because, it is kind of an oligopoly, like the sector is, worldwide, I mean globally." (Quote ID: GU1:9)* *"So, you have to dedicate resources, and if it is more easy to get it from an existing multinational that already knows about the language you are talking about, it is probably an easier door to open than having to explain to a venture capitalist about the sort of, justifying your start-up all the time." (Quote ID: GG1:7)*

Table A8-1: Data Structure of Ecosystem Analysis in Uppsala and Galway.

Appendix 9: Semi-Structured Interview Guide

The following topics and questions were included in the interview guide. Since these were semi-structured interviews, some questions were omitted or added on an ad-hoc basis depending on the answers previously given. Adjustments can be seen in the individual interview transcripts in Appendix 11. A word in square brackets indicates that a question is specific to a particular group of respondents, a word in italics and square brackets indicates a gap that was filled based on the characteristics of the respondent and/or previous responses.

Introduction

- Introduction of interviewer and interviewee
- Explanation of dissertation topic and purpose of the interview
- Permission to record the interview
- Clarify questions the interviewee might have beforehand

Warm-up

- Please tell me a bit about your background and your current occupation.

General Information on the Entrepreneurial Ecosystem

- [Entrepreneurs] Why have you chosen *[location]* to found and build your venture? Have you considered any other location besides *[location]*? Why have you chosen [location] in the end? Please talk me through the evaluation and decision-making process at that time.
- Who do you consider to be among the most important actors within the *[location]* entrepreneurial ecosystem and why?
  - What role does the local government take within the entrepreneurial ecosystem?

- [Government] Has the local government introduced any specific policy or any specific program regarding the local entrepreneurial ecosystem? If so, what kind of policy/program and what was the impact of said policy/program in the short run and in the long run? When and why did this happen?

- [Government] How would you describe the sentiment of the local/regional/national government towards entrepreneurship and towards entrepreneurs? How has this changed over time?

- [Entrepreneur] How would you describe the sentiment of the local/regional/national government towards entrepreneurship and towards entrepreneurs? How has this changed over time?

- [Entrepreneur] How important do you think the local/regional government is for the local entrepreneurial ecosystem and how has the government helped you with your venture's development?

- [Government] Are you aware of any plans by the local/regional/national government that may have an impact on *[location's]* entrepreneurial ecosystem? If so, what kind of plans, what do they entail, and what impact do you expect them to have?

- What is the role of the local universities within the entrepreneurial ecosystem and how does this manifest?

- [Scholars] Tell me about how the university is engaging with the local entrepreneurial ecosystem.

- [Scholars] Tell me a bit about spin-off activities within *[university]*. What approach are you taking? What impact do those activities have on the university and on the local entrepreneurial ecosystem?

- What is the role of *[support organization]* within the entrepreneurial ecosystem and how does this manifest?

- [Support organizations] What exactly are the support organizations in *[location]* offering? Who gets to benefit from those resources?

- [Support organizations] How is *[support organization]* financed? How does the business model look like?

- What is the role of *[corporate/MNE]* within the entrepreneurial ecosystem and how does this manifest?

- o [Corporates/MNEs] Tell me a bit about why you have chosen *[location]* for the subsidiary/HQ of *[corporate/MNE]*. Have you considered any other location besides *[location]*? Why have you chosen *[location]* in the end? Please talk me through the evaluation and decision-making process at that time.
- o [Corporates/MNEs] Tell me a bit about how you collaborate with local start-ups. Why are you engaging in such collaborative activities?
- o [Corporates/MNEs] Tell me a bit about spin-off activities within *[corporate/MNE]*. What approach are you taking? What impact do those activities have on your company and on the local entrepreneurial ecosystem?
- o [Entrepreneurs] Who do you interact with the most within the ecosystem and why?
- Who do you think is the main driver within *[location's]* entrepreneurial ecosystem? Is there any specific actor that "takes the lead"? If so, why do you consider this actor to be the main driver? What activities are they involved in?
- How do you perceive the investment activities in *[location's]* entrepreneurial ecosystem?
  - o Are the funds mainly coming from public or private sources?
  - o How have the investment activities changed over time?
  - o [Investors] Why do you have a specific interest in the *[location]* entrepreneurial ecosystem? What makes the location attractive to investors like you?
- [Government] What strategy does the local/regional government follow with regards to economic development in general? What roles do entrepreneurship and the local entrepreneurial ecosystem play?

Milestones of the Entrepreneurial Ecosystem

- Please talk me through the historical development of *[location's]* entrepreneurial ecosystem.

- Why do you think *[location]* has a vibrant entrepreneurial ecosystem? What sets *[location]* apart from other regions?

- What do you consider to be major milestones of the entrepreneurial ecosystem development in *[location]*?

Strengths, Weaknesses and Future Development

- What do you consider to be the strengths of *[location's]* entrepreneurial ecosystem? Why do founders choose *[location]* as their location to start and grow their ventures?

- What do you consider to be the weaknesses of *[location's]* entrepreneurial ecosystem? If those weaknesses can be somehow overcome, how do you think this would be possible?

- How do you think the entrepreneurial ecosystem in *[location]* will develop in the future, and why do you expect such a development?

- What do you think is needed so that the entrepreneurial ecosystem in *[location]* can "get to the next level"? What needs to happen and who do you think should be responsible for this? Why?

- [Entrepreneurs] Would you ever consider relocating to another region, domestic or abroad? If so, what circumstances would lead to that decision and what criteria would you use to select your new location?

- [Corporates/MNEs] Would you ever consider relocating to another region, domestic or abroad? If so, what circumstances would lead to that decision and what criteria would you use to select your new location?

Wrap-up

- Is there anything else you would like to add regarding the entrepreneurial ecosystem in *[location]*?

- Is there any question you have expected that I did not ask during the interview?

- Am I allowed to contact you again in case I have any follow-up questions?

- Is there anyone you have in mind that I should also talk to, to better understand the entrepreneurial ecosystem in *[location]*? If so, could you connect me with that person?

Appendix 10: Coding Frame for Interview Transcripts

The following coding framework was used to analyze the qualitative interviews. The codes are based on the domains of an EE, as defined by Isenberg (2011b, see also Appendix 1), and the information obtained during each interview. The first group of codes was applied to statements that represent subjective perceptions of the quality of the EE, defining characteristics, and historical development. The second group of codes was applied to statements about specific EE domains and their role within the EE. The coding framework was developed iteratively.

The codes were applied to the transcripts in Appendix 11. Each domain has its own set of codes to avoid overlap (see Schmidt, 2004, pp. 254-257). Based on this analysis, the data structures of the Uppsala and Galway analyzes (see Chapter 4 and Appendix 8) were built. The code hierarchy is shown in the following table:

Category	Sub-Domains	Code
First Set		
Characteristics and Context	Strengths	+++
	Weaknesses	---
	Neutral Processes	000
	Industry Clusters	IND
	Spatial Context	SPA
Development	Key Events	KEY
	Future Development	DEV
Second Set		
Policy	Government	GOV
	Leadership	LEA
Finance	Financial Capital	FIN
Culture	Success Stories	SUC
	Societal Norms	SOC
Human Capital	Labor	LAB
	Educational Institutions	EDU
Supports	Infrastructure	INF
	Support Professions	SUP
	Non-Governmental Institutions	NGO
Markets	Networks	NET
	Early Customers	CUS

Table A10-1: Code Hierarchy.

The following coding frame clarifies the scope of each code. The scope of some of the codes in the second set has been slightly adjusted from Isenberg's definitions (see 2011b and Appendix 1) to better cover and analyze the individual contexts of Uppsala and Galway.

Codes	Description
	First Set
+++	Strength of the entrepreneurial ecosystem
---	Weakness of the entrepreneurial ecosystem
000	Information on neutral processes within and/or influencing the ecosystem
IND	Information on industries, focus areas, and industry clusters
SPA	Information on the spatial context
KEY	Key event that influenced the entrepreneurial ecosystem, milestone
DEV	(Expected) future development of the entrepreneurial ecosystem
	Second Set
GOV	Institutions, financial support, regulatory framework incentives, business legislation
LEA	Governmental support, social legitimacy, open door for advocacy, entrepreneurship strategy, urgency, crisis, and challenge
FIN	Micro-loans, angel investors, family and friends, venture capital funds, private equity, public capital markets, debt capital
SUC	Visible successes, international reputation
SOC	Risk, mistake and failure tolerance, innovation, creativity and experimentation, social status of entrepreneurs, wealth creation, ambition, drive, and hunger
LAB	Skilled and unskilled labor, serial entrepreneurs, spin-offs by researchers
EDU	Degrees (professional and academic), specific entrepreneurship training, R&D activities and collaboration, university reputation and influence
INF	Telecommunication, transportation and logistics, energy, coworking spaces, physical collaboration spaces
SUP	Legal, accounting, investment banking, technical experts, and advisors
NGO	Entrepreneurship promotion in non-profits, business plan contests, conferences, entrepreneur-friendly associations, incubator, and accelerator programs
NET	Entrepreneurs' networks, diaspora networks, MNEs and large corporations
CUS	Early adopters for proof-of-concept, reference customers, first reviews, distribution channels

Table A10-2: Coding Frame.

Appendix 11: Interview Transcripts

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Anonymized interview transcripts are available from the author upon request.