Making Vienna a Leading Startup Center of Europe

Final Report to the Wirtschaftskammer Wien

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The authors alone, however, take full responsibility for any errors or shortcomings that might be contained in the report.

Executive Summary

The major purpose of this study has been to recommend feasible actions that can propel the Vienna region to become one of the leading dynamic centers for technology-based startups in Europe. The recommendations are based upon an empirical investigation of the strengths and weaknesses of the Vienna startup ecosystem that are enumerated and discussed in this report.

The study focuses on answering four principal, but related questions.

- **How much equity funding is there in Vienna (and Austria) overall, by type and by geographic source, and how has this changed over time?**

- **How is the investment community in Vienna organized? Is it relatively cohesive or fragmented? To what extent is it well connected with international investors? And what investment goals and strategies guide its decisions and behavior?**

- **What have been the common critical success factors for other dynamic startup centers in Europe that have emerged over the last twenty years?**

- **What are the strengths and weaknesses of the startup ecosystem of Vienna, and how can the ecosystem be strengthened, as seen from the eyes of Viennese investors?**

Our analysis of trends of equity funding for startups in Vienna reveals that investments of private equity as a percentage of GDP in Austria are well below the European average. A relatively high share of venture capital (VC) invested in Austrian companies is sourced from *outside* Austria. This indicates not so much a strong interest from international VCs in Austrian startups, but rather an underdevelopment of the domestic VC sector.

Similar to much of the rest of Europe, the private equity market in Austria essentially collapsed with the global financial crisis starting in 2008. It is now recovering towards its former pre-crisis level, albeit quite slowly. After the bottom fell out of Austria's private equity market, public funding as a source of equity funding has stepped up to help fill the gap. The public funding sources, however, have almost exclusively targeted seed- and very early- stage companies. The total amount of VC available in 2014 (the last year for which we have reliable data) for mid-and late-stage funding needs has markedly declined since 2007 levels. One of the major players in the pre-crisis period was commercial banks, but they have virtually disappeared as a source of investment in startups.

Angel investors, on the other hand, have emerged as a still small, but robustly growing, source of equity funding for startups in Austria. They fill a niche between the informal 'founders, friends, and family members' on the one hand, and venture capitalists on the other.

The Vienna investment community can be characterized as small, dynamic, and resilient. There are surprisingly strong ties with finance markets outside Austria in areas such as London, New York, Los Angeles, and Frankfurt. Unfortunately, there is, however, a lack of cohesiveness within the Vienna community. There is notable fragmentation among individuals, trust funds, and investment funds. Among the latter, a small group fund managers have become especially prominent. While there is a modest amount of syndication, the syndication partnerships tend to be between local and external funders rather than between Vienna-based funders.

The criteria used for whether to invest in a given startup vary somewhat in importance among the different types of investors. Many mention the usual items of a startup having good growth prospects, a viable business model, the existence of a prototype, and evidence of having done quality market research. Venture capitalists, however, emphasize the nature of the startup team – its composition in terms of competencies, its experience of having worked together, particularly under conditions of stress.

Venture capitalists tend to rely on recommendations for good startup prospects for investments from trusted insiders rather than from contacts by startups themselves, which is different from how business angels connect with startups. The business strategies of investors also differ considerably between angels and VCs in terms of their expected returns and the expected exit time.

We identified three regions in greater Europe -- Tel Aviv, Berlin, and Amsterdam -- that within a relatively short time were able to propel themselves into the list of the 20 highest ranked global startup centers from previously not being 'on the map'. While Vienna differs from these areas in terms of some attributes of their economic histories and cultural conditions, we can identify several common critical success factors, or pillars.

- *Very high priority among government and business leaders placed upon the promotion of entrepreneurship, and a strong lead role in championing and supporting startups taken by a public sector organization in close collaboration or partnership with a key private sector organization.*

- *At least one major equity investment initiative aimed at startups at various stages of growth from seed to late-stage with joint public and private funding and/or investment management.*

- *Coordinated development of the myriad elements needed for a highly successful and effective startup ecosystem. These elements include affordable workspaces, networking events, mentoring, public policy incentives directed towards investors, education and training in entrepreneurship, and funding instruments suitable for different stages of startup development and growth.*

The interviews of investors about their perception of the Vienna startup ecosystem revealed a larger number of weaknesses compared to strengths, but also a number of opportunities for government and business leaders to take action for improvement. Many investors view startup founders as lacking sufficient knowledge of business and product development, as well as weak ability to negotiate and collaborate effectively. They also see founders in Vienna to be more risk-averse than in Europe generally.

Additionally, investors see no clear vision or strategy on the part of government or business leaders to make Vienna more 'startup friendly'. In particular, there appears to be little inclination to remove unnecessary bureaucratic and regulatory barriers that discourage investors, especially from outside Austria.

Is there a shortage of equity capital available to startups in Vienna? Investors perceive there is no shortage at the seed and very early stages, especially with the public funding opportunities from FFG and AWS. But there is clearly a shortage at the mid- and late-stages, as a result of lack of interest by international VC investors. Although the FFG and AWS instruments were deemed as highly valuable in their niche, investors felt their effectiveness could be improved by reducing the restrictions on combining these funds with private equity funding and by lengthening the pay-back period.

There was a sense that business angels were becoming a more important segment of the market; their ability to better meet the needs of mid- to late-stage equity funding needs would be enhanced by the creation of angel platforms in which individual angels pool their funds and use professional management. Startup300 is viewed as one promising example of that direction.

A portion of the profits of large public corporations such as ORF and Wien Stadtwerke were seen as potentially valuable sources for the creation of VC funds for investment in startups in Austria. Large private corporations in Austria were criticized for not investing in, and then nurturing, spinoffs that would partner with the large corporation.

Present tax laws were viewed as providing insufficient incentives for investment in Austrian startups, especially in comparison with competitive regions in other European countries. In particular, the risks of losses faced by investors could be reduced with changes in the tax laws, and provisions for tax deductions for investments in certain categories would both encourage domestic investors and send a signal to international investors.

Finally, current regulations significantly increase the time and out-of-pocket expenses needed for incorporation, while there is notable difficulty and frustration in getting approval for participation by international investors.

Our eight recommendations are built upon the empirical findings summarized above:

1. Establish an ongoing platform (forum, roundtable) that brings together individuals from the key stakeholder groups – investors, entrepreneurs, public policy officials, business organizations (e.g. WKW). This organization should be given broad responsibilities including harmonizing goals for Vienna becoming a startup hub, suggesting strategies and actions of how the startup ecosystem can/should be improved, assigning appropriate responsibilities for implementation based upon competencies and legal authority, mediating conflicts among stakeholder and interest groups, and monitoring progress on implementation. There should be a leader of the platform that enjoys broad support and respect among the various groups and can successfully build support from both the political and business communities.

2. Create a pool of public and private funds, in the order of 100 million EUR, specifically targeting mid- to late-stage tech-based startups. There is a sufficient supply of seed funding for promising startups. The funding needs of companies after the seed and early stages are larger, thus requiring a larger pool than is currently available. We suggest using public funds to match private funding. Such an arrangement would have the advantage of reducing the risk to venture capitalists and angels, and at the same time help to attract additional international investors. Having professional, highly experienced, private sector management of the fund would send an important signal to the investment community. The sources of public funds might be from the city of Vienna, quasi-public but profit-making organizations (e.g., ORF, WienEnergie, Wien Holding), and/or the federal government.

3. Establish a one-stop office within the City of Vienna for assisting and supporting startup businesses. The purpose of such an office is to connect startups with a wide range of both public and private resources, including finding suitable space, infrastructure, mentors, provide access to investors, sponsoring events, and networking. This might be modeled on the very successful program in Amsterdam, Startup Amsterdam, in which a quick response team is formed for each startup, co-led by a public and private official. The City of Berlin's Infrastructure/Founder Campus program, in partnership with Exocet Berlin GmbH, fills similar startup needs, and has also been very successful.

4. Encourage and support individual angel investors to form Super Angel Funds and Angel Platforms in Vienna. Angel investors fill an important and somewhat different niche from venture capitalists within the broader investor community. Yet they can be even more effective by pooling their separate assets, with professional management support, designed to enable making larger investments with reduced risk, to promising mid- and late-stage businesses for which equity capital is most scarce in Vienna. Startup300 is an excellent initiative in this direction, and it would be wise to build upon it.

5. Reform the existing government's tax policy that discourages VCs and other equity providers from operating in Vienna and Austria, in comparison to other locations in Europe. Providing tax deductions for equity investments in Austria, and reinstating government guarantees to investors in order to reduce their risk of loss should be 'on the table'. Such reforms would not only encourage a higher incidence of investments in startups by Austrian investors, but also would be able to attract more substantial international investors to Austria, paving the way for healthy development of the domestic equity market.

6. Reduce the bureaucratic 'red tape' faced by foreign investors that increases time and out-of-pocket costs for incorporation of new businesses in Austria. Tech-based startups also often need to be able to quickly procure very specialized scientific and technical skills that are available from non-EU countries.

Further reductions in the time for non-EU professionals to gain residence (work) permits would help to make Austria more competitive relative to other EU countries.

7. Engage in further educational reform at all levels to better prepare the next generation of graduates with the skills and attitudes needed for entrepreneurship. This is a long-term effort, but will help change the existing culture in Austria towards greater dynamism, openness, competition, and risk-taking, attributes that have helped Berlin, for example, shed its conservative mantel and become one of Europe's leading startup centers in a relatively short time.

8. Design and implement a systematic marketing campaign to 'brand' Vienna as the next dynamic startup center in Europe. It is much more than the Hapsburgs, schnitzels, and opera! The message should be that Vienna has 'buzz', is innovative and open, home to a growing number of risk-taking entrepreneurs who are attracted to Vienna as a great place to live and for its public and private sector programs that make Vienna extremely 'startup friendly'. This is a message that is complementary with Vienna as a Smart City, for example, but it does have a different focus.

Executive Summary (Deutsch)

In der vorliegenden Studie wird der Frage nachgegangen, welche Maßnahmen in Wien zielführend wären, um die Region zu einem dynamischen und vitalen Ökosystem für high-tech Startups zu entwickeln. Hierzu wurden in einer empirischen Erhebung die Stärken und Schwächen des Wiener Ökossystems ermittelt und mit ausgewählten Stadtregionen in Europa verglichen.

Es wurden vier Hauptfragestellungen identifiziert, die im Rahmen der empirischen Untersuchung beantwortet wurden:

- Wie viel Finanzkapital steht in Wien (und Österreich) insgesamt zur Verfügung? (mit Schwerpunkt auf Art und Herkunft des Kapitals bzw. Veränderung über die Zeit)
- Welche Organisationsformen lassen sich im Investitionsumfeld in Wien identifizieren? Handelt es sich um ein stark konzentriertes oder eher gestreutes Angebot? Gibt es enge international Verflechtungen? Welche Investitionsziele und -strategien, lassen sich identifizieren?
- Welche Erfolgsfaktoren lassen sich aus anderen dynamischen Startup Zentren im Umkreis von Europa ableiten?
- Welche Stärken und Schwächen zeigt das Ökosystem Wien und welche Maßnahmen zur Verbesserung sehen Investoren am Wiener Markt?

Die Analyse zeigt deutlich, dass der prozentuelle Anteil des privaten Investitionskapitals für Startups am österreichischen BIP deutlich unter dem europäischen Durchschnitt liegt. Ein relativ hoher Anteil an in österreichische Unternehmen investiertem Risikokapital kommt aus dem Ausland. Dies ist allerdings kein Indikator für ein übermäßig starkes Interesse ausländischer Investoren in österreichische Startups sondern viel mehr eine Schwäche bzw. Unterrepräsentativität des inländischen Risikokapitalmarkts.

Der österreichische Privatkapitalmarkt hat sich ähnlich wie in anderen europäischen Ländern nach der Wirtschaftskrise im Jahr 2008 nicht mehr erholt. Der derzeitige Umfang ist in etwa mit jenem vor der Krise vergleichbar. Durch den Verfall des Privatkapitalmarktes wurden die öffentlichen Fördergelder entsprechend angekurbelt, um die fehlenden Finanzmittel ausgleichen zu können, allerdings mit einem speziellen Fokus auf Seedkapital und Förderung von Startup Unternehmen unmittelbar nach deren Gründung. Der Umfang des Risikokapitals für Unternehmen in der Wachstumsphase lag im Jahr 2014 (Daten sind nur bis zu diesem Jahr verfügbar) weit unter jenem des Jahres 2007, also vor der Wirtschaftskrise. Einer der Gründe für diese starke Reduktion ist der Ausstieg der Banken aus dem Risikokapitalgeschäft, da diese umfangmäßig zu den größten Kapitalgebern vor der Wirtschaftskrise zählten.

Business Angels zählen hingegen zu den aktivsten Finanzgebern für österreichische Startups, wenngleich deren Anzahl immer noch vergleichsweise gering ist. Dennoch stellen Business Angels eine durchaus ertragreiche Nische zwischen der klassischen ‚founders, friends, and family members' Kategorie und Risikokapitalgebern (VCs) dar.

Insgesamt präsentiert sich die Investmentszene in Wien als klein, dynamisch und resilient, aber auch als stark fragmentierter Markt. Es lassen sich durchaus enge Verbindungen mit den Finanzmärkten in London, New York, Los Angeles und Frankfurt identifizieren, was für einen kleinen Markt wie Österreich durchaus bemerkenswert ist. Allerdings fehlt es an Kohäsion in der Wiener Szene, die sich durch starke Fragmentierung im Zusammenspiel mit einzelnen Akteuren, Investmentfonds und Treuhänderfonds wiederspiegelt. Speziell im Bereich der Investmentfonds hat sich eine kleine Anzahl an Fondsmanagern einen Namen gemacht. Es zeigt sich ein geringes Maß an Zusammenschluss zwischen Kapitalgebern, und dies ausschließlich zwischen lokalen und externen Fonds und nicht zwischen den am Wiener Markt ansässigen Fonds.

Es zeigt sich ein geringfügiger Unterschied bei der Investmententscheidung zwischen den einzelnen Typen von Investoren. Viele Investoren entscheiden nach klassischen Kriterien wie die Marktfähigkeit bzw. das Wachstumspotential oder aber ein überzeugender Businessplan, die Existenz eines Prototypen, sowie ein überzeugender Marktüberblick. Für VCs scheint das Schlüsselkriterium im Bereich des Teams zu liegen, hier ist es insbesondere die Zusammensetzung des Teams, die komplementären Kompetenzen im Team und vor allem die Fähigkeit der einzelnen Teamplayer miteinander zusammen zu arbeiten vor allem in extremen Stresssituationen, die als besonders wichtig gewertet wurden.

VCs bekommen häufig über ihr Netzwerk Kontakt zu Startups, so sind es häufig Informationen von ‚Insidern', die zu interessanten Startups führen. Business Angels auf der anderen Seite tauschen sich häufig aus, werden aber auch in der Regel aktiv von Startups angesprochen, das liegt weitgehend daran, dass die Business Angel Szene aus wenigen bekannten Personen besteht. Die Investitionsstrategie der beiden Investorentypen unterscheidet sich vor allem in deren angestrebten Ertrag und der Dauer der Investition bzw. dem Exitzeitpunkt.

Im Rahmen der Studie wurden drei Stadtregionen – Tel Aviv, Berlin und Amsterdam – identifiziert, die allesamt den Sprung in die Top 20 Rangliste der globalen Startup Zentren in nur kürzester Zeit geschafft haben und somit durchaus als Vorbildregionen für Wien gewertet werden können. Wien unterscheidet sich von diesen Städten im Bereich der historischen Wirtschaftsentwicklung und auch der kulturellen Gegebenheiten, dennoch können gemeinsame Erfolgsfaktoren identifiziert werden.

- Höchste Priorität für die Förderung von Entrepreneurship von Seiten der Politik und der Wirtschaft und eine gezielte Förderung von Startups von Seiten der öffentlichen Hand in Kooperation mit privaten Schlüsselorganisationen.

- Zumindest eine große Investmentinitiative zur Förderung von Startups von der Seedphase bis in die späte Wachstumsphase, die durch eine gemeinsame Förder- und Managementstruktur von Seiten der öffentlichen und privaten Hand gekennzeichnet ist.

- Ein koordiniertes Vorgehen, um die zahlreichen Faktoren und Elemente, die zu einem erfolgreichen und effektiven Startup Ökosystem führen, zu bündeln. Darunter fallen u.a. die

Zurverfügungstellung von leistbaren Arbeitsbereichen, Netzwerkaktivitäten und Events, Mentoring, Incentives für Investoren, Aus- und Weiterbildung im Bereich Entrepreneurship, und Förderinstrumente für Startups in den unterschiedlichen Entwicklungsphasen.

Im Zuge der Interviews mit Investoren in Wien wurden vergleichsweise mehr Schwächen als Stärken identifiziert. Im Gegenzug wurden allerdings eine Reihe von Vorschlägen bzw. Maßnahmen für eine potentielle Verbesserung der Situation identifiziert. Investoren sehen ein potentielles Problem darin, dass viele Gründer nicht genügend Wissen und Erfahrung im Bereich Unternehmens- und Produktentwicklung bzw. geringes Verhandlungsgeschick und Erfahrung im Bereich von Kooperationen mitbringen. Aus Sicht der Investoren sind Gründer in Wien auch im Vergleich zu ihren Kollegen in anderen europäischen Städten nicht ganz so risikofreudig.

Darüberhinaus fehlt es nach Meinung der Investoren an einer klaren Vision bzw. Strategie zur Förderung eines Startup freundlichen Umfelds von Seiten der Politik und der Wirtschaft, die auch zu einer Reduktion bürokratischer und ordnungspolitischer Barrieren verhelfen könnte. Bürokratische und ordnungspolitische Barrieren werden als wesentliche Hindernisse für ein wachsendes Interesse an ausländischen Investoren in Österreich gesehen.

Gibt es einen Mangel an privatem Investitionskapital in Wien? Die befragten Investoren identifizieren keinen Mangel für die frühe Gründungsphase, jedoch wird ein deutlicher Mangel für die Entwicklungs- und Wachstumsphase der Unternehmensgründung diagnostiziert, welcher auf das Desinteresse internationaler Investoren rückgeführt wird. Obwohl das öffentliche Förderangebot der FFG und AWS als sehr wertvoll hervorgehoben wurde, könnte deren Wirksamkeit dadurch verbessert werden, dass eine Kombinationsmöglichkeit mit privatem Investitionsmöglichkeit ermöglicht und der Rückzahlungszeitraum ausgedehnt wird.

Vor allem mit Business Angels wird die Erwartung verbunden, dass sie besser in der Lage sind, die Bedürfnisse von Start-ups in der Wachstumsphase zu erfüllen. Hilfreich dafür kann das Initiieren einer Angel Plattform sein, in welcher die einzelnen Business Angels ihr Fonds bündeln und welche durch ein professionelles Management begleitet wird. Startup 300 ist ein vielversprechendes Beispiel in diese Richtung.

Eine weitere Möglichkeit wird darin gesehen, dass größere öffentliche Organisationen, beispielsweise der ORF oder die Wiener Stadtwerke, einen Teil des Gewinns in Form von Risikokapitalfonds in österreichische Start-ups investieren. Zugleich wurde kritisiert, dass größere österreichische Unternehmen nicht in Spin-offs investieren und diese fördern.

Die derzeitige steuerliche Situation in Österreich bietet zu wenig Anreizstrukturen für Investitionen in österreichisches Startups, im Vergleich zu anderen europäischen Regionen. Im Besonderen könnte das Verlustrisiko, welchem Investoren ausgesetzt sind, durch Änderungen des Steuerrechtes sowie der Absetzbarkeit von Investitionen in Start-ups in speziellen Bereichen positive Signale an heimische und internationale Investoren senden.

Im Weiteren wurde auch der Prozess der formalen Gründung des Unternehmens als zeit- und kostenintensiv beschrieben.

Unsere acht Empfehlungen, welche sich aus den empirischen Erhebungen ableiten, lauten in Kürze wie folgt:

1. Initiieren einer aktiven Plattform (Forum, runder Tisch) welche Personen von den bedeutendsten Stakeholdergruppen – Investoren, Unternehmer, öffentliche Verwaltung, Wirtschaftsorganisationen wie z.B. die WKW - verbindet. Ziel dieser Plattform ist das Abstimmen von Zielen, aufteilen von Verantwortlichkeiten

2. Gemeinsamer Fonds von öffentlichen und privaten Finanzmitteln, welcher mit einem Finanzrahmen von bis zu 100 Mio. Euro ausgestattet ist und vor allem in die Entwicklungsphase von Unternehmen investiert wird.

3. Gründen eines One-stop-Offices in Wien, um Start-ups zu beraten und zu unterstützen.

4. Angel Investoren dazu auffordern Super Angel Funds und Angel Plattformen in Wien zu initiieren.

5. Eine gezielte Steuerreform, um die Hürden für Investoren abzubauen. Diese Reform sollte Steuererleichterungen für Risikokapitalinvestitionen in österreichische Startups, aber auch das Wiedereinführen von staatlichen Garantien beinhalten, um das Risiko für österreichische und internationale Investoren zu minimieren.

6. Gezielte Reduktion des Verwaltungsaufwandes für internationale Investoren, um deren Zeitaufwand als auch die Zusatzkosten gering zu halten.

7. Adaption des Bildungssystems, sodass Unternehmertum zum immanenten Bestandteil von Schul- und Studienprogrammen wird und damit die Schüler und Studierenden mit den erforderlichen Skills ausgestattet werden.

8. Entwerfen und implementieren einer Marketingkampagne, um die Marke Wien zu etablieren und Wien als dynamisches Startup Center hervorzuheben

Goals and Focus of the Study

The present study evolved from an earlier one conducted in 2012-2013 that investigated the incidence of spinoffs from universities in Vienna, and specifically to identify the barriers to the creation of a larger number of university spinoffs (Goldstein, Peer, and Sedlacek, 2013). One of the outcomes from that study, focused on the perspective of academic researchers turned entrepreneurs, was that, among other factors, the scarcity of equity investments was a major barrier to increasing the incidence of tech-based startups in Vienna.

There is, indeed, a widespread perception of a scarcity of private equity for investments in knowledge-based startups in Vienna, but we had a hypothesis that the situation was somewhat more complicated than that, especially when the focus broadens from university spinoffs to startups more generally. To more carefully address the question of adequacy of equity investments for startups in Vienna, we approached the question from two different angles. First, instead of examining the barriers to startups from a founder's, or entrepreneur's perspective, we now focus on the behavior, attitudes, and perceptions of the supply side – the investor community in Vienna. Second, funding and investments for new ventures are not independent, or exogenous factors. That is, it is important to consider the entire startup ecosystem of Vienna, since the attractiveness of investors to startups in Vienna, at their various stages, depend on the strength and weaknesses of other elements in the region, in addition to the situation of the particular startup.

This study starts by examining the time trends of different types of private and public equity in Vienna and Austria, making preliminary inferences about shifts and changes in these trends, and comparing the trends in Austria with other EU countries (Section 1).

We then move on to looking at the behavior and structure of the investment community in Vienna, including how well connected the members are to each other, the strength of linkages to other investors outside of Vienna and Austria, how integrated or fragmented the investment market is, and how well the investors are connected to the founders (Section 2).

Section 3 examines the startup ecosystem in three highly dynamic city regions in greater Europe: Tel Aviv, Berlin, and Amsterdam. These three regions emerged as global startup centers relatively recently. We look at what the critical success factors have been for these cities, and what the lessons might be for Vienna to be able to attain similar success.

In section 4 we explore in depth the views of members of the Vienna investment community. Key informants were selected from three different types of investors: business angels, venture capitalists, and public and quasi-public funding organizations. The results here include statements from the investors about why they do or do not invest in Vienna startups, and suggestions for how they believe the startup ecosystem in Vienna can be strengthened.

Finally, we provide a list of recommendations for actions to advance the goal, *if adopted*, of Vienna becoming a dynamic and leading startup center in Europe, competitive with Berlin, Amsterdam, and others. These recommended actions span the creation of new institutional arrangements, new funding instruments, policy changes, and regulatory reform.

Section 1. How much investment funding for tech-based startups is there in Vienna?

Young, innovative, high-growth firms are given high importance for job creation and economic performance in general (Bravo-Biosca et al. 2013). In recent years, especially since the financial crisis of 2008, these young innovative firms face an increasing number of difficulties in accessing seed and early stage financing. The situation of Austria will be depicted taking into account developments in Europe.

Definitions and differentiated of sources of data (EVCA, 2014):

Industry statistics are an aggregation of figures according to the country of the private equity firm´s office in charge of the investment. At the European level this relates to investments made by European private equity (PE) firms regardless of the location of the portfolio company. On the Austrian level it refers to those PE firms located in Austria and their fundraising, investment and divestment activity with portfolio companies regardless of their location.

Market statistics are an aggregation of figures according to the location of the portfolio company. At European level this relates to investments in European companies regardless of the location of the private equity firm. For Austria, market statistics include all portfolio companies located in Austria, and the investments and exits of domestic and foreign PE firms.

The indicators of the private equity situation (and of venture capital as part of it) are aggregated on a national as well as European level in cooperation with the European Venture Capital Association (EVCA) by means of the analytical tool "Private Equity Research Exchange Platform" (PEREP). The categories are:

> **Fundraising**: the statistics included here are recorded in the country of the advisory team that is raising/managing the fund (industry statistics) (funds raised include private equity funds making direct private equity investments, mezzanine private equity funds, co-investment funds and rescue/turnaround funds)
>
> **Investment**: statistics focus on the equity value, that is, the amount of capital invested to acquire shares in an enterprise. The equity value includes equity, quasi-equity, mezzanine, unsecured debt and secured debt provided by the PE firm. Not considered are borrowed funds from third parties (e.g. banks).

1.1 What has been the time trend of investment and fundraising of private equity and VC in Austria?

Between 1995 and 2010, European venture capital investment has been, on average, approximately one-third the size of investment in United States. However, the number of venture capital deals in Europe is higher than in the United States, showing that venture capitalists are dispersing funds more broadly through smaller deals (Wilson and Silvia, 2013).

The Austrian market for venture capital has developed from the mid-90s on and is thus young and relatively small in an international comparison (Jud, Marchart et al. 2013). Industry statistics, collected since 1989, reveal that the investments of private equity by private equity firms located in Austria as percentage of GDP of the private equity firm located in Austria are well below the European average (Europe: 0.30 percent of GDP versus Austria: 0.03 percent of GDP, 2015), placing Austria sixth from the bottom in European ranking (Invest Europe, 2015). Focusing on the investment of just *venture capital*, Austria performs somewhat better in the European comparison, ranking Austria tenth from the bottom (Europe: 0.025 percent of GDP vs. Austria: 0.008 percent of GDP, 2015). Interestingly, market statistics (focusing on the location/country of the portfolio company) of venture capital investments reveal that Austria performs above the European average with 0.03 percent of GDP in comparison to the European average of 0.02 percent of GDP. This places Austria in the sixth position among the top ten European countries after Finland, Switzerland, Sweden, Ireland and the United Kingdom. These numbers underpin the fact that foreign venture capital firms invest a higher amount of VC into portfolio companies located in Austria than do VC firms located in Austria. Table 1 presents total amounts of these investments as well as market statistic in detail, by stage in the startup life cycle.

Table 1: Investments of Private Equity – market and industry statistics, Austria (Data source: EVCA, 2015)

	2007	2008	2009	2010	2011	2012	2013	2014
Industry statistics (in 000 EUR)								
Total PE investment	393,815	214,339	140,208	129,594	124,056	154,878	86,091	105,628
Total venture (% of total PE)	38,005 (9.7%)	31,850 (14.9%)	35,604 (25.4%)	29,132 (22.5%)	24,827 (20.0%)	24,640 (15.9%)	25,901 (30.1%)	24,536 (23.2%)
Seed	8,389	5,389	5,877	6,028	7,393	8,647	11,316	10,250
Startup	15,811	9,551	13,308	4,605	6,168	10,311	4,782	4,442
Later stage venture	13,805	16,910	16,419	18,499	11,266	5,682	9,803	9,844
PE as % of GDP	0.14%	0.07%	0.05%	0.04%	0.04%	0.05%	0.03%	0.03%
Market statistics (in 000 EUR)								
Total PE investment	905,548	326,153	178,337	703,037	321,821	282,287	554,501	288,377
Total venture (% of total PE)	79,884 (8.8%)	50,760 (15.6%)	75,888 (42.6%)	43,564 (6.2%)	93,755 (29.1%)	42,544 (15.1%)	63,173 (11.4%)	61,625 (21.4%)
Seed	7,575	5,087	6,377	6,028	6,028	9,176	11,316	10,500
Startup	28,593	26,482	43,732	14,161	14,161	28,075	23,788	25,786
Later stage venture	43,716	19,191	25,779	23,375	23,375	5,292	28,069	25,339
PE as % of GDP	0.32%	0.11%	0.06%	0.24%	0.10%	0.09%	0.17%	0.09%

Table 1 depicts the development of the Austrian private equity market, which is comparable to the overall development in Europe, although on a much smaller scale. Since the outset of the financial crisis starting in 2008, the private equity market has slowly recovered on the European level but has stagnated in Austria. Interestingly the amount of venture capital invested in the seed stage of the company after the financial crises outweighs the venture capital available before. This might be explained through the public actors stepping in as providers of venture capital after 2008 (see also Section 1.4). On the other hand, the venture capital available for the later stage of the development of Austrian companies (market statistics) decreased since 2007.

Disaggregated by industry sector, private equity in Austria is predominantly invested into, Chemicals and materials, followed by Life Sciences, Business and Industrial Services, Business and Industrial products, and Consumer Goods and Retail (Jud, Marchart et al. 2013). Among all Austrian portfolio companies in which PE is invested, between 8.2 percent (2007) and 13.3 percent (2014) are defined as high-tech companies (EVCA, 2015).

Disaggregated by the stage of venture (see Fig. 1), the majority of private equity was invested in Austria between 2001 and 2005 in the expansion and growth phase of companies, followed by a focus on buyouts between 2007-2012. The amount of private equity invested in the startup phase varies between 1.3 percent (2004) to 12.3 percent (2013) of the total private equity invested.

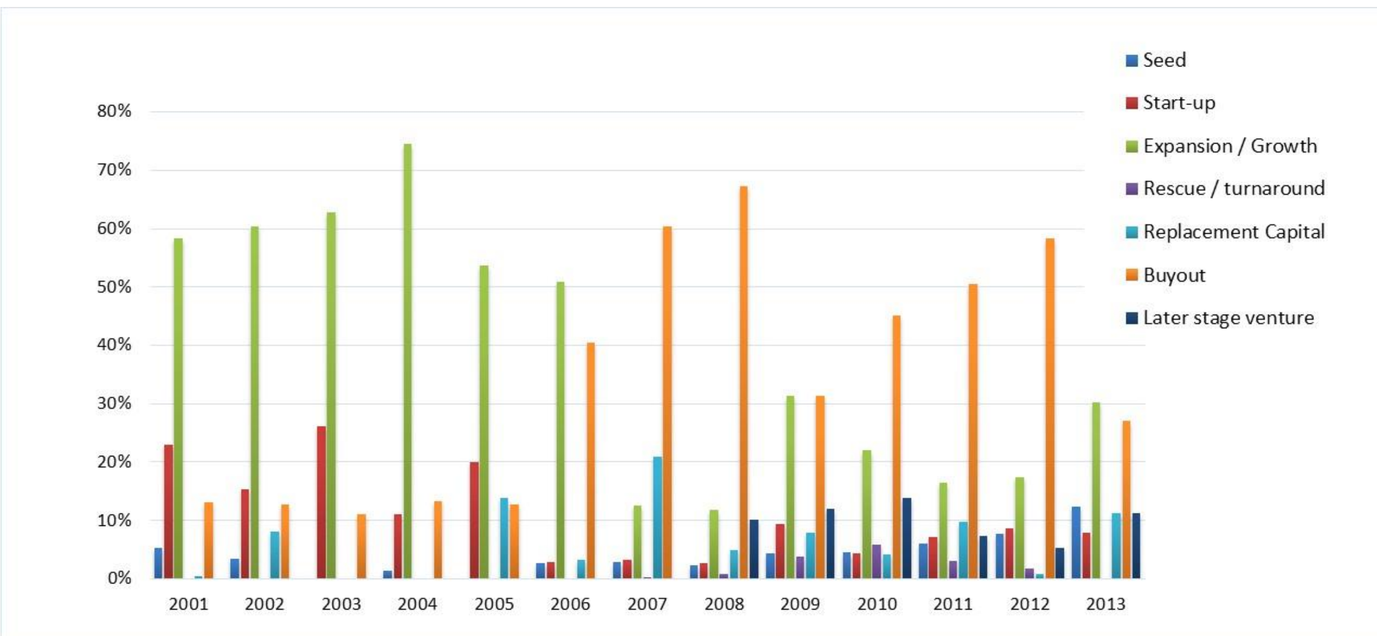

Figure 1: Stage distribution of private equity investments in Austria per year in %. (Data source: EVCA, 2015)

Private equity fundraising in Austria

In Austria two developments caused a decline in the private equity, and especially venture capital, raised after 2008: (1) the financial crisis, and (2) the restructuring of the Austrian fund structure according to the European Law on State Aid. Both developments had a negative impact on the attractiveness of Austria and Austrian businesses for international investors.

Table 2: Funds raised in Austria compared to Europe 2007 - 2014 (Data source: EVCA, 2015)

	2007	2008	2009	2010	2011	2012	2013	2014
Funds raised – AUSTRIA (in EUR Mio.)								
Total raised	400.1	246.8	331.8	172.4	249.2	172.6	23.5	13.2
Total early stage raised	0	0	51.8	17.6	21.0	10.0	18.5	10.0
Funds raised – EUROPE (in EUR Mio.)								
Total raised	79,587.0	80,047.5	18,913.6	21,797.2	41,603.5	24,579.5	54,395.3	44,639.4
Total early stage raised	3,848.2	2,310.6	1,772.9	1,022.0	1,978.7	2,190.8	1,714.1	2,266.8

Although the decline of private equity funds after 2008 was significant for Austria, it was not as dramatic as the European-wide decrease of -84 percent from 2008 to 2009 (see Table 2). There was a significant retreat of institutional investors from the private equity market in Austria and Europe generally. Commercial banks, the most important source of investment before the financial crisis in Austria, totally withdrew from the PE investment after 2009 (Jud, Marchart et al. 2013). Since 2009, public authorities stepped in and became the most important players in the Austrian venture capital industry (see Figure 3). Pension funds and insurance companies play more subordinate roles in the current Austrian fundraising scene.

1.2 How does the amount of funding in Austria compare with other European nations?

The amount of investment in Austrian portfolio companies serves as an indicator of the (international) attractiveness of Austrian businesses. Austria never reaches a position among the top ten European destinations for private equity investments (see Table 3). The UK ranks first throughout the timeframe 2007-2014, followed by Germany and France. The German private equity market is bigger as well as more internationally focused compared to the Austrian market. Nevertheless the interviewed experts point out that the high amount of already- invested capital from international venture capital firms (see market statistics in Table 1), underpins the attractiveness of Austrian businesses. Furthermore experts concur that the demand for venture capital among Austrian companies is higher than the supply provided by Austrian as well as international investors so far. Some of the explanations offered for this are discussed in more detail in Sections 2 and 4.

Table 3: Comparison of investments by location of portfolio companies of selected European countries and overall European ranking (Data source: EVCA, 2015)

	2007	2008	2009	2010	2011	2012	2013	2014
Investments by location of portfolio company (in EUR Mio.)								
Austria	905.5 (#13)	326.2 (#18)	178.3 (#21)	703.0 (#12)	321.8 (#15)	282.3 (#14)	554.5 (#13)	288.3 (#16)
Germany	10,448.0 (#3)	9,583.7 (#2)	3,023.8 (#3)	4,894.9 (#3)	6,666.9 (#3)	6,626.0 (#2)	5,054.8 (#3)	7,164.5 (#3)
Netherlands	4,626.1 (#4)	2,784.9 (#5)	885.5 (#10)	2,055.1 (#6)	2,885.3 (#5)	1,379.9 (#8)	2,371.1 (#4)	3,125.8 (#4)

The AVCO (Austrian Venture Capital Organization) describes the situation of the Austrian venture capital market as alarming, pointing out that in 2015 only 108.6 million EUR were invested in Austrian companies, leading to a two position drop in the international ranking (AVCO, 2016). Although private investors – Speedinvest has been explicitly mentioned – have risen to 74.3 percent of all funds raised in 2015, it is indispensable to attract international investors to support Austrian startups in all their development stages (from seed to expansion).

Data on the situation of the Vienna region specifically is not easily found. This data gap was also emphasized in a recent study, funded by the Wirtschaftsagentur Wien and carried out by the IHS, the law firm of Kinsky, and Dr. Funke of the WU-Wien (Wirtschaftsagentur Wien, 2015). They revealed in their survey, which consisted of 211 interviews with start-ups in the Vienna region, that 800 million in venture capital was raised within the last five years, or an average of 160 million per year. It was also revealed that a majority of investment has been made by national investors. Investments of more than 1 million tend to come from international investors, as there is a considerable 'gap' of investments between 1 and 10 million in Austria.

These results are surprising since a former study by Ernst & Young reports a figure of overall 27 million of venture capital for 2014 in Austria as a whole. Thus the lack of consistent investment data sources has to be kept in mind when interpreting the data.

1.3 How much investment funding comes from inside and outside the Vienna region?

In principle the focus on a regional scale is not part of the private equity concept, as the focus is a national, international and global one (source: expert interview). Nevertheless the current situation of the Austrian private equity industry shows a more regional focus than in the past. Reasons for this can be detected in the newly dominant role of public authorities as sources of investments, and some of the public sector initiatives have been at the federal provincial level.   Early stage funds have been established by the federal provinces of Lower Austria, Burgenland, Vienna, Upper Austria and shortly also Carinthia. These publicly initiated funds may be contradictory to the aim of attracting more international investors.

Between 2007- 2011 non-syndicated investments in Austrian portfolio companies outweighed the amount of syndicated investments, although the latter increased in importance over time. The non-syndicated investments in Austrian portfolio companies' origin are mostly from PE firms located in Germany (see Figure 2). Turning to syndicated investments, PE firms located in Germany play an outstanding role: in early stage investments since 2007 Austrian PE firms only syndicated with PE firms located in Germany. Overall syndications between internationally located PE firms investing in Austrian portfolio companies play a more important role than syndications between Austrian PE firms or Austrian-international syndications. In addition to Germany, the UK, Switzerland and the U.S. play important roles regarding investments in Austrian portfolio companies (Jud, Marchart et al. 2013).

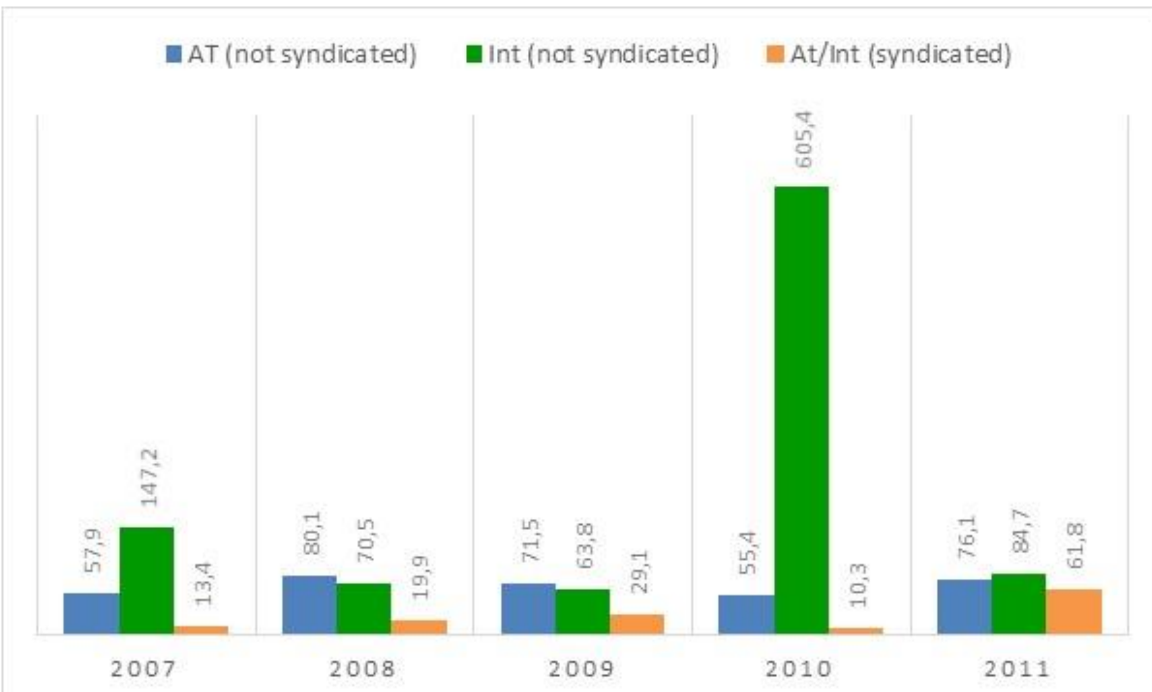

Figure 2: Syndicated versus non-syndicated PE investments of Austrian and foreign Fonds in Austrian portfolio companies (in Mio. EUR 2007-2011) (Data source: Jud, Marchart et al. 2013)

1.4 How much investment funding is provided by source types: venture capital, business angels, commercial banks, crowd funding, public sector funds, other private funds?

Since the financial crisis, young innovative firms face an increasing number of difficulties in accessing seed and early stage finance. Banks have been less willing than before to provide loans to startups.

Although venture capital is commonly assumed to be the main source of seed and early stage financing, in reality, the majority of venture capital firms have become more risk averse and moved to later stage investments leaving the seed and early stage market to 'informal' investors (OECD, 2011).

Angel investors, who are often experienced entrepreneurs or business people, have become increasingly recognized as an important source of equity capital at the seed and early stage of company formation (Harrison and Mason, 2010). They operate in a segment where the demand for capital is still comparatively low, but on the other hand the willingness of venture capital funds to invest is limited (Gassler and Sellner, 2014). Thus they fall between informal founders, friends and family financing, and formal venture capital investors (Gassler and Sellner, 2014; Sohl, 1999).

Angel investors tend to invest in a broader range of sectors than do venture capitalists, although the bulk of investment is also typically in ICT, biotech and health related technologies (OECD, 2011). Companies in the ICT sector often have a lower capital intensity and shorter route to exit, making them attractive to angel investors (Ries, 2011).

Although angel investors have become more visible and active through groups, syndicates and networks, they also face difficulties. As a result, governments in many countries have sought to address the financing gap and perceived market failures by supporting the seed and early stage market (Wilson and Silva, 2013). In Europe there has been a significant change in the mix of institutional investors in venture capital over the past five years with the share of government agencies increasing from 14 percent in 2007 to 40 percent in 2012 (see Figure 3). Although there was a corresponding 57 percent drop in the total amount of funds raised during that period, including a 47 percent drop in seed and early stage venture capital, the amount of funding from government agencies increased by 85.4 percent between 2007 and 2012. While the increase in government agency funding is a response to the financial crisis, it shows a growing reliance on public sector funds in the European venture capital market (EVCA, 2012).

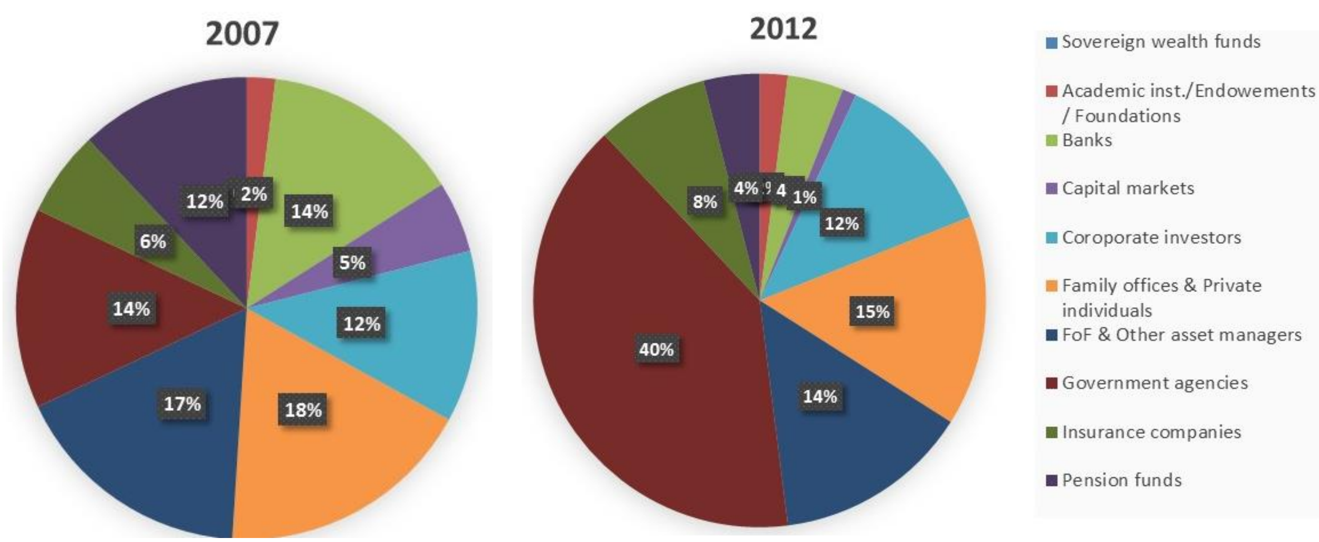

Figure 3: Venture funds raised in Europe by type of investor (2007 with a total of EUR 8.3B vs 2012 with a total of EUR 3.6B) (Data source: EVCA, 2015)

These developments can also be observed in Austria. The dominant investors between 2001 and 2007 in Austria were: (1) banks, (2) insurance companies and (3) government agencies. Funds of funds, pension funds, and private individuals play less important roles. With the financial crisis of 2008, the situation of PE investors in Austria changed with (1) government agencies becoming the most important player followed by (2) private individuals. Banks totally stepped back from venture capital investment as did insurance companies (see Figure 4).

What can be currently observed in the Austrian PE market is a 'battle' between different financing models in the startup phase. On the one hand the deal-by-deal model continues the traditional concept of single investors acting by themselves. On the other hand there is a growing trend, though still small, for different types of investors (business angels, banks, foundations, etc.) to pool their capital into a larger, conglomerate fund.

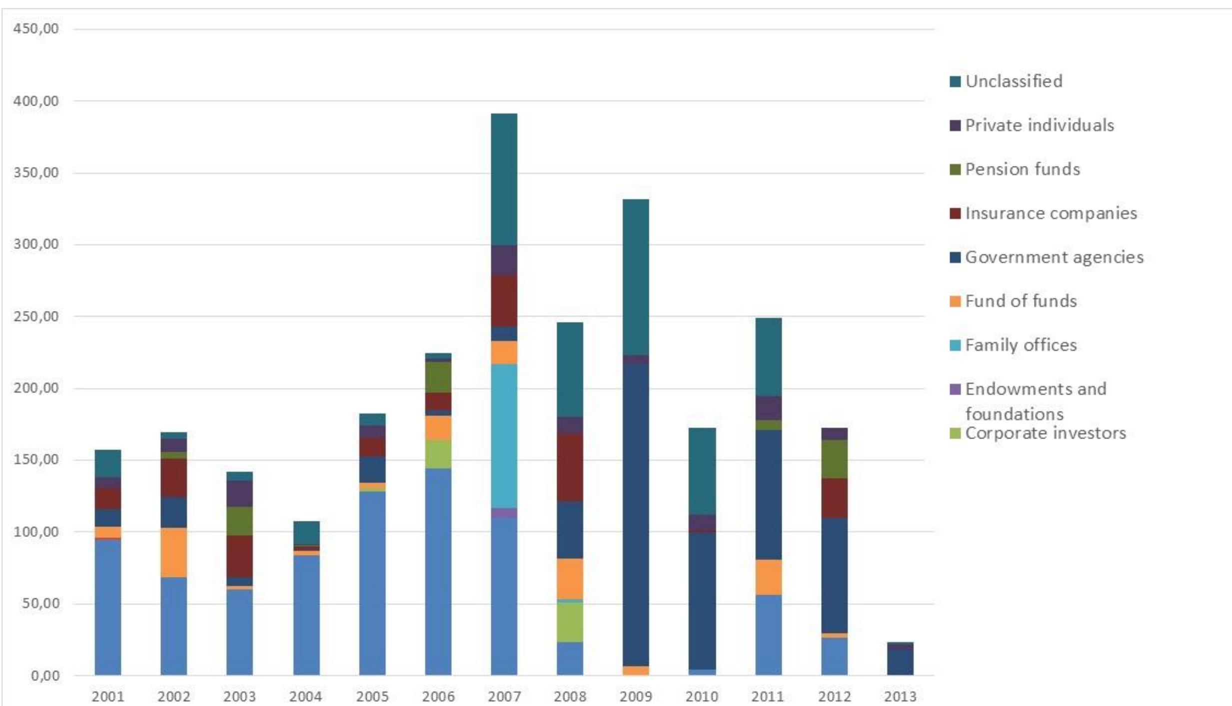

Figure 4: Types of PE investors in Austria (Data source: AVCO, 2000 – 2006; EVCA, 2007 – 2013)

Section 2. A Profile of the Startup Investment Community in Vienna

2.1 How is Vienna's investment community organized: Cohesive or fragmented?

The Viennese investor ecosystem is small but dynamic. It is active locally, nationally, regionally and in the global finance markets. There is evidence of strong ties with the respective markets of finance in London, New York, Los Angeles and Frankfurt. Since the financial crisis, due to new regulations and for reasons of capital adequacy, the banks are largely absent as risk takers. Banks are still present as brokers between wealthy individuals and startups as well as guarantors of finance deals. This implies a fragmentation of the market for risk capital among wealthy individuals, trust funds and investment funds. And while the market is not very big by volume, a small group of fund managers have become prominent in the last decade. However, prominent angel investors and professional investors do not appear to have much common ground. Most deals are syndicated between local and external funds. And although investment syndication (as a distribution of risk) is considered to increase robustness in other markets, given the size of the Austrian investment market, it is arguably best for these risks to be dissipated with external actors to the ecosystem.

Overall, there are many different types of syndication. Equity investments and loans to startups are the most common. The use of crowd funding, or online platforms such as Angelist, are alternative types, where, however. no real ties can be assumed among syndicate partners and where the fund manager/principal is the only investor with a full appreciation of underlying risks. It should also be remembered that investors that specialize in a particular stage in a startup's growth trajectory seek an exit as soon as the next stage is reached. Therefore, in a smaller and highly specialized investment market like Vienna, it is unlikely for VCs to syndicate across a firm's growth trajectory. Firms are therefore likely to seek investors beyond Vienna as they grow.

One view expressed by investors we interviewed was that "professionals do not need partners" since the "tickets [i.e. size of investment] are small". One venture capitalist quipped that it was like "asking a shark if he likes a family", further implying that they would not syndicate their star deals. At the same time it was recognized that syndication "is signaling who you swim with" and therefore syndication emits a signal of market esteem. It was therefore implied that syndication on equity investments was only strategic and unlikely to be part of the seed-capital, early-stage investment in a firm. Syndication clearly requires trust among parties, but it was notably pointed out that syndication was more common with partners from foreign markets. The lack of information on syndication was considered symptomatic of the lack of general information on active investors. This compares unfavorably with other investor markets, like the UK, where such transactions are more transparent.

The Vienna investor ecosystem is generally perceived as resilient by those we interviewed. They understand resilience as low exposure to high risk investments. The entrepreneurial ecosystem is seen to be growing rapidly, while the ecosystem of high-tech startups was generally viewed as vibrant. But this is not an all-around rosy picture. The ecological metaphor is useful in conveying interdependence and complexity, but is less suited to convey the relationship between locations (i.e. across ecosystems). It is the case for instance that the local investor ecosystem is dependent for large deals on global players that are subject to the vagaries of global finance. Basel III and other EU regulation are not implemented uniformly among EU member states, distorting the playing field for investors based in different states.

Overall, the presence of many active players, including “public, private and universities” and the absence of “monopolists” is perceived to increase systemic resilience. At the same time caution is advised, as there are strong expectations of growth in the startup market, that are not realistic, as “there is not so much energy in the economy to have all of them grow”. Considering the resilience of the Austrian investor ecosystem, it may very well be that “the last crisis was not one of the economy, but the financial sector”, and by implication, that the ecosystem fundamentals are robust.

2.2 What decision criteria are used for investing in startups?

Professional investors interviewed have sophisticated and well developed models for understanding finance risk and startup growth potential. They build small teams of experts that specialize in different aspects of firm performance. Beyond finance they therefore provide consulting services, either as part of the investment agreement or via separate contracts. Angel investors appear to act in a more ad hoc way, by utilizing their extensive goodwill networks for sourcing promising investment opportunities and intuitively assessing start-up teams and market potential. There is evidence of some level of antagonism between the two types of investors.

When we asked our interviewees about the investment criteria they employed their answers were predictable but also nuanced: growth prospects, a valid business model, the existence of a product/prototype and the quality of market research. Of particular interest was the focus on teams. It matters if the startup team can convince investors that ‘they execute well’, in other words that they are able to deliver and that they have experienced of ‘really hard times before’ so they will do well ‘when they are under stress’. Thus, serial entrepreneurs are at an advantage. Interviewees also mentioned what can be termed ‘soft’ criteria. These include team composition and the entrepreneurial ability in a venture team. One VC declared a rule of thumb for determining whether a venture had a potential market: “would ten calls to my contacts get them a client?” Another asks “is this idea valid – has it worked before?” It is worth noting that none of the respondents consider the ‘lone inventor’ as a viable business proposition. Fundamentally, “investors expect some return…it’s about business and it’s about money and this should be clear in the startup business.” The investment discourse on innovation often obscures the fact that generally investors do not have an appetite for promoting invention, per se, and accordingly only judge startups on business (or product) viability criteria.

How should new ventures improve their appeal to investors? VCs indicated that the source of a lead to a company is fundamental. As one prominent VC put it, “did we look for them?” which can make the difference on whether they would consider investing at a high valuation. It indicates that ‘cold calls’ from ventures might be less effective than recommendations from trusted insiders or visibility gained by a startup through media and industry events. Government funding and seed-investment grants can be seen as a form of endorsement that signals value in a startup to potential investors.

2.3 What strategies do investors follow, and how much do they vary?

Investor strategies obviously vary among the different type of investors (angel, professional, institutional) both in terms of the expected returns, exit time frame and overall investment ethic. The more systematic strategies appear among professional and institutional investors. Answers from the former are explored below.

One investor outlined his/her investment strategy by saying his firm expects 20 percent of the investments to 'be fantastic', 30 percent to 'do well' and 50 percent to fold within a three-year time-frame. Venture capitalists claim their objective is to take an asset/company that lacks (or has uncertain) trade value and try to create an asset that can be traded. In that respect, startup companies are the goods that these investors trade. Successful strategies involve investors locating new deals, assessing them and pooling adequate finance to execute them. Critical is deciding at what stage of the commercialization cycle to enter and exit. Indeed, investors have a very specific time horizon, typically ranging from three to five years, which, when reached, they should be able to exit, i.e., capitalize on their investment. They may also exit a promising investment because they need to close a fund. A challenge for startups therefore is that they have to align with an investor's entry and exit cycle. Predictably again, investors identified important attributes including: networking; executing deals well; market recognition – to be known; having key (lead) investors from industry; to be seen as connectors (brokers) in the ecosystem; and investing in what they understand. Venture capitalists are eager to have more professional entrants as "it would be good to have more people active in the industry", and welcoming foreign investors who have experience with startups. As mentioned earlier, the small size of the investment market implies that for a number of the less prominent sectors specialized investor expertise does not exist locally.

Controversially, VCs also viewed, "business angels (as having) a big ego, they want to improve the world" which renders them unreliable as investors. As a counterpoint, professional investors should "take on only startups they understand…and keep the principals on-board." To the degree that these distinctions are meaningful, and as stated by Hellman and Thiele (2015), VCs and angel investors appear antagonistic.

2.4 What policy recommendations are suggested by our understanding of investor behavior?

Economic orthodoxy accepts, ceteris paribus, that the development of the financial market, the legal framework, the tax system, labor market regulations and public investment correlate with the presence of venture finance (Lerner and Tag, 2013). Policy interventions in the context of Vienna can take the form of (1) eliminating regulations that are found to be inhibiting the ecosystem, (2) implementing regulations in a way that favors high innovators and startups, so as to compensate for the existing momentum of large corporate actors (Auerswald, 2015) and (3) creating new policies which could emulate success in other ecosystems or address the need for structural adjustments. As a full policy evaluation of the startup ecosystem is beyond the scope of this report, suggestions here do not attempt a comprehensive assessment of insights gained versus the status quo. Drawing on the interviews of these key stakeholders we make suggestions that require further validation in juxtaposition to existing regulations in Austria.

Suggestions to compare and potentially align the regulatory framework in Austria with those of the main competitor nations and regions are obvious. It was suggested by interviewees that **tax incentives for business angels** should address venture risk by allowing for loss deductions such as allowed under UK regulations. We identified a gap in **the venture capital finance market for intermediate-stage ventures**, at the 2 to 5 million EUR. It is possible that this can be addressed via incentives to **develop the market for syndicated investments** that is currently restricted to angel investor consortia and large multi-national investments.

Enhancing the reputation of Vienna as start-up friendly. Consultants (KPMG,2014) report low interest in Vienna among startup entrepreneurs located in neighboring regions and countries. The promotion of successful venture stories and profitable VC exits would improve the profile of the ecosystem. At the same time it is the case that Vienna, as the core innovation hub in Austria, is well placed to take advantage of potential synergies with 'satellite hubs' in other parts of Austria, as well as Hungary, Slovakia, Slovenia, the Czech Republic and even countries further afield among the high-tech ecosystems of Germany and Switzerland.

An interesting insight in the present study points to the importance of teams for venture success. Support services and entrepreneurial education should therefore focus on team-level entrepreneurship and not just atomistic entrepreneurial skills. This could have far-reaching implications on the design of course curricula and suggests **orienting educational programs towards the development of team business skills**. At the same time, support services, now aimed at the individual entrepreneur or the new venture should also consider the needed support for team building and leadership. Since respondents also identified a need to improve professional consulting for startups, it seems pertinent to alert the service sector to the requirements of the ecosystem.

Policy recommendations with a high probability of implementation attempt to provide incentives, while maintaining a low impact on public finances. For instance, the tax treatment of startups can be more favorable by **extending the ability to transfer losses from previous account years** well beyond what is permissible for other corporations.

Another low cost policy intervention would be to **focus existing funding institutions** (e.g. AWS, WAW,) on (1) **high impact growth start-ups**; and (2) **highly innovative, game-changing startups,** which are startups likely to have a slower route to market as they need to develop new technologies, but have enormous upside potential. The first type of company would provide micro-unicorns (market capitalizations of over 100 million) and draw talented young people to the startup industry. The second type of company would provide a technological edge in the long term, reflecting the recognition that startup finance is driven by investor expectations and not some form of a 'natural' cycle in startups. The higher the ratio of innovations the longer it is likely to take for new technologies to reach commercial applications. A relevant recent example is the discovery of graphene at Manchester University and the large number of start-ups in 2D materials that are located in the hub funded with public resources.

Finally, we have no doubt that any incentives or inducements provided would have to be regularly evaluated and compared with inducements to other equivalent ecosystems in Europe and beyond.

Section 3. What can we learn from the successes of other dynamic regions in Europe?

There is more than one path, or recipe, for a region to become a startup center. How Vienna might become a startup center in the future cannot be copied from the successes of other regions. It will need to build upon its unique assets as well ameliorate its present weaknesses. Nevertheless, it can be quite useful to examine how other regions in Europe have developed into leading global centers for startups, and to identify some commonalities that were instrumental to their successes.

To identify suitable benchmark regions for Vienna, we looked at city regions of roughly comparable size to Vienna, and which developed to become global startup centers only within the last 20 years. Thus we eliminated regions like Silicon Valley and Boston because they were of an early vintage and had unique assets that cannot possibly be replicated in Vienna. We also eliminated regions such as New York, Los Angeles and London because their sheer size gave them advantages in attracting finance capital that are unrealistic for Vienna.

Using the *Global Startup Ecosystem Ranking 2015* (Compass, 2015) as a guide, we identified three benchmark regions in Europe (broadly defined) that are now considered to be among the top 20 global regional ecosystems for startups, but which were hardly 'on the map' 20 years ago. These are Tel Aviv (ranked #5), Berlin (#9), and Amsterdam (#19) (Appendix D shows the ranking of the top 20 startup ecosystems for 2015 and changes from 2014). Unfortunately the Global Startup Ecosystem Ranking 2015 only ranks the top 20 and thus comparable data and ranking for Vienna are not available. There are, however, rankings by the World Economic Forum, Global Competitiveness Report 2015-2016 at the country level that are helpful for comparing Austria to Israel, Germany, and Netherlands along dimensions that are quite relevant for assessing startup ecosystems. These country rankings are shown in Table 4 and based upon data covering 140 countries total. The table shows Austria ranks well below the other three countries on almost all dimensions, but *particularly* so on venture capital availability where it is only at about the 40th percentile among all 140 countries.

We now provide synopses of the success factors for the respective startup ecosystems of Tel Aviv, Berlin, and Amsterdam, relying upon a number of sources in the literature including expert opinion as well as official government documents.

Table 4: National Rankings for Innovation Capacity (Data source: Global Competitiveness Report 2015–2016; World Economic Forum, 2015)

Rank/140	Israel	Germany	Netherlands	Austria
Pillar: Financial Market Development	26	18	31	47
Availability of financial services	36	18	11	23
Affordability of financial services	57	14	17	22
Financing through local equity market	36	17	22	32
Ease of access to loans	52	35	49	67
Venture capital availability	4	25	24	58
Soundness of banks	19	46	60	68
Regulation of securities exchange	38	26	18	51
Pillar: Innovation	3	6	8	17
Capacity for innovation	3	5	16	8
Quality of scientific research institutions	3	9	6	25
Company spending on R&D	5	6	18	14
University-industry collaboration in R&D	7	10	9	24
Gov't procurement of advanced tech products	8	10	21	66
Availability of scientists and engineers	8	15	22	37

3.1 The Tel Aviv Startup Ecosystem

Tel Aviv is widely considered one of the best places on the globe to start a company, and its impressive record of startups supports that reputation. *The Compass Global Startup Ecosystem Ranking 2015* places Tel Aviv in 5th place. It ranks below Silicon Valley (1st place), but ahead of every region in Europe including greater London.

Tel Aviv's success in building a vibrant startup ecosystem has some attributes that are unique to the history and culture of the country of Israel and thus may not be transferable to Austria, but there are also elements that can be adapted or at least provide some lessons and ideas for building a dynamic ecosystem in Vienna.

First, what are Tel Aviv's relative strengths in terms of its startup ecosystem? What stand out in strengths that give it such a high ranking are: scientific and technological talent, the amount of startup experience among employees, and foreign market reach (Compass, 2015). Regarding the concentration of talent, one source estimates that with 140 scientists, technicians, and engineers per 10,000 employees (85 per 10,000 in the U.S.), Israel has the highest concentration of any country in the world.

The *relative* weaknesses are a small internal (domestic) market, lower average amount of seed funding per venture, and the total size and growth *in value* of all startups, although in absolute terms Tel Aviv is still among the top 15 of all metropolitan regions in the world in each of these measures. These relative weaknesses are all related to the fact that Tel Aviv is not a large metropolitan region, compared to say, London, New York, Paris or Silicon Valley.

On a more qualitative level, Tel Aviv's ecosystem is embedded in a culture of creativity, risk taking, high energy, and individualism. One publication describes this culture as 'refuse to die' and 'survivor' mentality of its citizens, referring to the continual high risk Israel faces from war and violence (5 Reasons Israeli Startups Are So Successful). Indeed, mandatory military enlistment has played an important role in providing knowledge, experience and skills for many budding entrepreneurs, because of the military requirement to be able to be able to process large amounts of information quickly for quick decision-making under high stress. Indeed, it is widely perceived that the military experience promotes a culture of challenge rather than one of hierarchy.

The current programs and organizations that comprise the ecosystem evolved from the creation of a national network of technology incubators. The strategy was to take advantage of the high concentration of researchers developing innovative technologies by providing space, synergy, and support for startup companies. What was lacking was financing, so the national government created a matching investment program, Yozma, that induced leading VCs and other investors from the (largely) U.S. to invest in fledgling Israel startups. This matching program proved to be hugely successful: Israel's annual VC outlays rose from 58 million USD to 12.5 billion USD between 1991 and 2000. Later the incubators were privatized, but the new owners still received funding to run the incubators and related support programs, while the government equity ownership was transferred to the private owners. The incubators work on the principle of competition, both in terms of which entities receive licenses to run and manage incubators, and which startups receive larger-scale public funding in the form of grants to be repaid and government assumption of some risk after the initial two years of incubation. Although the technology incubators were a national program, Tel Aviv emerged as the leading location for startups owing to its size, location (including the principal international airport) as well as amenities of being on the coast and its strong universities with their large pool of scientists and engineers.

A final element in Tel Aviv's success is that entrepreneurs realized at the beginning that they must adopt an aggressive international outlook as far as markets and market penetration because the domestic market was, and continues to be, quite small.

3.2 The Berlin Startup Ecosystem

Berlin has actively worked on becoming a global startup location since the late 1990s. It had made steady but slow progress, but since 2010 it has dramatically accelerated and now is ranked #9 in the world, and #2 in Europe (Compass, 2015). The number of startups located in Berlin, between 1,800 and 3,000, is modest compared to 3,100-4,200 for Tel Aviv and pales in comparison to Silicon Valley's 14,000-19,000. The total value of startups in Berlin, estimated at between 25-30 billion (USD) is roughly the same as Tel Aviv, but it is only one-tenth that of Silicon Valley's. Berlin's startups are concentrated in IT-related sectors, including eCommerce, gaming, and software.

Berlin's ecosystem is similar to Tel Aviv's on several key attributes, but owing to its different history and culture, it has faced different challenges than Tel Aviv. The relative strengths of Berlin's ecosystem are its talent pool and the number of founders with startup experience (ranked #8) (Compass 2015). One of its relative weaknesses had been investment interest evidenced by a low level of exits. This has markedly changed in recent years. Funding is now considered a strength as a result of a number of highly visible, large- scale exits that, in turn, have made Berlin even more attractive to outside investors. The remaining weakness is market reach, in which many startups have had limited growth because of their focus on local, niche markets. However, this too has been changing as the latest generation of successful startups has more likely sought to market their products globally.

Berlin has been able to attract what is, arguably, the best talent pool for entrepreneurship in Europe, by having (1) a relatively low cost of living that allowed for initially lower start-up costs; (2) an open, alternative, and counter culture, based partially upon its past as a divided city which helped to attract a concentration of artists and others seeking creative outlets, as well as a pool of potential entrepreneurs; (3) the lack of a strong industrial economy with its fostering of preferences for job security and risk aversion. Berlin's culture in this sense starkly contrasts with Germany as a whole, which is still quite conservative in terms of business. The recent successes of startups have helped to eliminate as a hindrance to the development of an entrepreneurial culture an earlier lack of experienced mentors.

There is now in place a well-developed physical infrastructure to support startups. In terms of spaces, Berlin offers a diverse range of co-working spaces, accelerators, and incubators that help to reduce startup costs but also provide connections and networking opportunities. The city government (state of Berlin) partners with Exocet Berlin GmbH to jointly coordinate the infrastructure/Founder Campus program. This initiative works to develop and improve the technical infrastructure, workspaces, and connectivity that make the city conducive to the location for startups.

A key institution in the supply of funding for seed and early stage startups has been IBB Beteiligungsgesellschaft (IBB-Bet). IBB-Bet was founded in 1997 as a joint venture of the Investment Bank Berlin (IBB) and the city of Berlin. It is a major provider of VC for Berlin startups. It operates two funds, VC FondsTechnologie Berlin (with a volume of about 52 million EURO) and VC Fonds

Kreativwirtschaft Berlin (with 30 million EURO volume). Notably, *all of the funds are public funds.* IBB-Bet invests in startups that show potential for fast growth in their early stages, starting from seed, and stays with the startup for a period of three to five years, until exit.

In terms of public policies that help or hinder the startup ecosystem, there is a mixture. The creation of the corporation type "Unternehmergesellschaft" (UG) has helped to reduce the time needed for incorporation. As in all EU countries (at least in theory), it is easy to attract and integrate talent from other countries within the Union, but there are distinct barriers to attracting talent from outside the EU, in comparison to more immigration friendly nations.

3.3 The Amsterdam Startup Ecosystem

2015 marks the first time Amsterdam's startup ecosystem has been ranked in the top 20 in the world (19th) and is rated the 6th best in Europe (Compass, 2015). Within Europe its growth rate is third highest behind only Berlin and London. Amsterdam currently has, as an estimate, between 1,900 and 2,600 startups, roughly the same as Berlin. The estimated value of the startups, between 8 and 10 billion USD, however, is only about one-third of Berlin's. On The Global Startup Ecosystem Ranking's principal pillars, the market reach of Amsterdam's ecosystem is a relative strength compared to other highly ranked ecosystems. This is attributed in large part to startups having to focus on global markets for their products since their domestic market is small. On the other hand, Amsterdam's ability to attract investment has been a relative weakness.

From a review of numerous articles about Amsterdam's startup scene, it is apparent that Amsterdam as a city offers numerous amenities that attracts entrepreneurs. These include a vibrant and diverse set of cultural opportunities and affordable living and working spaces (compared to many other European capital cities). The city is excellently served by nearby Schiphol Airport and it occupies a location in the heart of the most innovative part of Europe.

The Dutch as a whole are highly educated especially in mathematics. Their use of English in daily business probably exceeds every other country in continental Europe. Amsterdam and its surrounding region including Utrecht and Delft, is the location for some of the finest universities in Europe. Moreover, it has been noted that Amsterdam was built by merchants, not by empires, and entrepreneurship is in the Dutch DNA. Innovation is promoted by the Dutch and the Netherlands has served as a testbed for many new products. All of these factors have made Amsterdam a highly desirable location for international companies to locate their principal European branches in Amsterdam, as well as for attracting and retaining international talent. The city's infrastructure now includes several successful and visible accelerators Startupbootcamp and Rockstart, lots of co-working spaces, and organizations to support connectivity and networking among startups and between startups and larger established companies.

As mentioned, Amsterdam's relative weakness in its startup ecosystem is in terms of funding and investment. The angel community is in its nascient stage. There is a gap in funding between the seed stage and growth stage of new companies, while VCs, like elsewhere are only interested in investing in proven, growth-stage companies. Compared to Tel Aviv and Berlin, the number of exits is quite low.

This has retarded the flow of outside VC to Amsterdam startups as well as limiting the number of entrepreneurs with startup experience and knowhow for scaling up companies and for serving as mentors to would-be and new entrepreneurs.

There are three organizations/initiatives that are playing key roles in driving Amsterdam's startup ecosystem. StartupAmsterdam is a public-private partnership, initiated by the by the Deputy Mayor of Amsterdam in January 2015, that connects startups with a wide range of both public and private resources important for their successful growth. The services provided by StartupAmsterdam are organized into fifteen different action programs targeted to help startups find talent, connect with users and customers, connect with each other, and access funding. A quick response team is formed for each startup, co-led by a public and private official.

A second important actor is KPN Ventures, a subsidiary of the Dutch telecom giant KPN, with a fund of 35M EUR for investment in Dutch startups. Initiated in June 2015, it is headed by the former Dutch Minister of Finance, currently serving as the CFO of KPN. KPN Ventures is one of the initiatives to help fill the recognized gap in Amsterdam between funding at the seed stage and late stage investing.

The third key organization is StartupDelta. An initiative of the Dutch national government, StartupDelta is focused on strengthening the international position of startups in the Netherlands generally, and to recruit promising foreign startups to locate in the Netherlands.

3.4 Takeaways from the Benchmark Regions

The benchmark areas of Tel Aviv, Berlin, and Amsterdam are all different from Vienna in a number of important respects. The specific strategies and programs for startup ecosystem development that have been successful in these benchmark regions might not be effective or perhaps not even feasible in Vienna. Nevertheless, when each of these regions started their respective as a global startup center, they shared some similar conditions with current Vienna. More importantly, there are several key success factors that are common among them, despite quite different histories, cultures and economic development paths. Here we identify the three pillars of strategic initiatives that appear to be common success factors.

First, in all three benchmark regions government and business leaders have given very high priority to entrepreneurship. A public sector organization in close collaboration or partnership with a key private sector organization took a strong lead role in championing and supporting startups. In Tel Aviv, the Israeli government established a national network of technology incubators. Later the incubators were privatized, but are still strongly supported by the national government through assumption of risk for those startups that demonstrated the highest likelihood of success through competition. A principal focus and mission of the Tel Aviv city government, in partnership with established multinational corporations, has been to support startups through provision of platforms and infrastructure (such as co-working spaces) and by lowering barriers to success (such as providing local tax breaks for new startups, and reducing 'red tape'). In Berlin, the city government, in partnership with Exocet Berlin GmbH, takes leading responsibility for developing the infrastructure (such as affordable work spaces, networking) for the support of startups. Amsterdam's StartupAmsterdam, a collaboration between the city government and multiple private sector actors, has the lead responsibility for providing a wide range of services to startups.

Second, in all three benchmark areas, there is **at least one major equity investment initiative aimed at startups at their various stages of growth from seed to late-stage**. In Berlin this is the IBB Beteilunggesellschaft (IBB-Bet), a joint venture between the federal state of Berlin and the Investment Bank Berlin (IBB). Its two funds have a volume of 82M EUR available for investment in the most promising startups in their early stages and then to provide continuing support until exit. In Amsterdam it is KPN Ventures, a subsidiary of the Dutch Telecom giant, KPN. Although KPN Ventures is private, there is close collaboration with public sector organizations in terms of providing additional support services, and the organization is headed by the former Dutch Minister of Finance. In Tel Aviv there is now a mature and effective set of private sector VC providers. However, the current well-developed VC sector was made possible by the Yozma initiative, a national government program started in 1993. With a long-term goal of developing a viable and thriving VC sector, Yozma offered generous tax incentives to foreign VC investors along with 2 to 1 matching investments from the national government. The resulting attraction of foreign VC investors to Israel was instrumental in the development of the *domestic* VC industry as, particularly in this sector, 'success builds success'.

The third pillar is having **coordinated development of the many elements needed for a highly effective startup ecosystem.** These elements range from the provision of suitable workspaces, networking, mentoring, public policy incentives, education and training, and funding, to name just some. Some of these elements are the responsibility of public sector organizations while others are more suitably undertaken by the private sector. There will always be a division of responsibilities. What we know from the experiences of our benchmark regions, as well as other areas that have made impressive jumps in the rankings for startup success, is that an effective set of working relationships, based upon trust, among the various organizations and stakeholders developed. In the case of Tel Aviv the degree of coordination became more decentralized after the ecosystem achieved maturity. In the cases of Berlin and Amsterdam, which still need to strengthen some of their key elements, the coordinating mechanism has been more centralized. For Amsterdam this coordinating role has been taken by the city's StartupAmsterdam organization, for Berlin the coordinating organization is the Berlin Startup Unit of the Berlin Partner for Business and Technology.

Section 4. How is Vienna's startup ecosystem perceived by investors?

There are three major types of equity investors for technology-based startups in Vienna, and each type tends to have its own perceptions of the startup investment opportunities and risks in Vienna. The three types are: business angels, venture capitalists and public/semi-public funding organizations. Business angels, or angel investors, are wealthy individual persons or families, in a number of cases former or current entrepreneurs, who provide capital for start-ups in exchange for ownership equity. Their activity may range from a one-time investment to an ongoing stream of investments, from an investment in only one startup to a portfolio of new companies. The size of angel investments are typically small owing to the fact that the assets available are from only one individual or family. Venture capitalists on the other hand are investors who manage pooled money from many other investors and place the pool of money in a fund. They usually invest in new businesses with a high potential for growth. Public or quasi-public funding organizations in Vienna range from well-known federal public funding organizations/banks such as FFG and AWS to regional organizations like Wiener Wachstumsfonds or tecnet equity NÖ Beteiligungs-Invest GmbH.

At the outset of this study a preliminary round of pilot interviews with well-known investors of different types was conducted. During these interviews we asked for names of other prominent investors. These, combined with results from an Internet search, led to a longer list of investors and investor organizations that would serve as our key informants. Altogether more than 20 interviews were conducted using a semi-structured interview protocol. The list of interviewees and the protocol can be found in Appendices A and B.

Both business angels and VCs came to the conclusion that the ecosystem is well developed when it comes to the conditions for startup funding for the first and second year, that is, the seed and early stage. Business angels assessed the entrepreneurs and founders highly positively, they appreciate that Vienna is populated with many highly motivated young people and presents a critical mass of startups even though the regulatory framework is not completely supportive for the startup scene. VCs and funding organizations detected excellent pre-conditions and the existence of well-known business angels that began as startups. Those ‘zero entrepreneurs’ are acting now as business angels who know the market well and have experience, which gives the location and the start-ups the needed backing. The downside is the lack of international investors who would be interested in supporting start-ups *after* they have managed to survive the early stages. This paucity of international investors is a major reason for the insufficiency of venture capital in Vienna for the growth and later stages. Generally speaking the ecosystem of Vienna offers an excellent starting point for technology-based startups, but it suffers from structural deficits when it comes to having available larger investments needed for the growth phase of new businesses.

There were three major areas with embedded structural deficits brought to our attention during the interviews when we asked our interview partners to assess the Vienna high-tech startup ecosystem, the *market features*, the *business skills of entrepreneurs*, and the *impacts of the given startup policy*. Before addressing more detailed elements of the ecosystem the general perception of the investors in our sample according to these three areas will be presented.

The VCs characterized the ecosystem as founder-driven and not investor-driven. This is consistent with the perception of the funding organizations in our sample of interviewees that Austrian startups are not on the radar of international investors. One reason offered is the *small size of the local market*, compared to other centers in Europe, and as a result a somewhat closed ‘club’ of investors, with only a few, in effect, serving as gatekeepers that provide entrée to other investors. Navigating the informal network that connects founders with investors in Vienna becomes a challenge to new founders. VCs also perceive a lack of dynamism in the Vienna ecosystem. The small domestic market and reluctance among entrepreneurs to take the risks of marketing on a global scale feeds back to hindering the success of many startups in their critical growth stage. This forms a vicious cycle when investors perceive this reluctance on the part of entrepreneurs, and particularly makes it more difficult to gain the attention of international investors.

Business angels and VCs were critical in their assessment of the available *business skills and knowledge of entrepreneurs.* They report anecdotal evidence that startup companies lack sufficient knowledge about business development and lack project skills. Another observation is that young entrepreneurs show a lack of negotiation and cooperation skills which hinders a professional performance in investment talks. If the general tenor is that young entrepreneurs in Vienna are not perfectly equipped for developing their companies then this might influence the attractiveness of the Vienna ecosystem for investors more generally. Another aspect mentioned is that entrepreneurs and managers in Vienna startup companies tend to be more risk averse compared to other startup ecosystems in Europe, which results in more risk-averse growth strategies.

Investors in Vienna do see demand for reform and change when it comes to the perceived *impacts of existing policies and regulations*. The criticism spans from a lack of a clear vision and strategy for growth put forth by government leaders, to unnecessary and harmful bureaucratic barriers. Some investors would like to see more strategic political decisions which would signal a more investor friendly atmosphere as well as public interest in several components of the startup ecosystem, for example more initiatives to attract more venture capital or a solid basis of state capital guarantee.

In summary, the investors we interviewed perceive the Vienna ecosystem as well developed in many aspects. They also see the need, however, for selective actions for Vienna to become more dynamic and to be better known by international investors. The following paragraphs are presenting a more detailed picture about certain elements of the ecosystem.

4.1 Is Vienna becoming a startup center in Europe hindered by a lack of equity capital?

A vital ecosystem needs enough financial capital in order to be become competitive. Hence investors were asked about the finance availability in Vienna. There is general agreement there is *more than enough financial capital for the early stages* available in Vienna, but there is severe lack of capital for the growth phases. A critical consequence of this is that many entrepreneurs leave Vienna once their business is starting to grow and their subsequent need for larger investments.

Business angels in our sample assessed the availability of funding for the early stages positively. They warned, however, that new public funding instruments such as the double equity program provided by AWS cannot replace private capital, since not enough money is made available, conditions on ownership are quite restrictive, and the money must be paid back rather quickly. These types of programs fulfill a *different* function from venture capital. If used as a stimulus for startups with a promising growth option these programs help to incentivize investment in the second round. But there would be a need to push the second round and to provide better conditions for investors, particularly because banks are not able to take on more risk after the implementation of BASEL III. In addition, business angels assert that Vienna is still a place where the 'family, friends and fools' (FFF) pitches are very common, but these cannot replace private capital in the later stages. There is also thought to be less capital from familyowned businesses as potential angel investments here in Austria compared to Switzerland, Italy or the Scandinavian countries. Without generating more attractive options for generating equity capital for the growth phase of startups, there will indeed continue to be a shortage of finance that will hold back Vienna from developing into a dynamic European startup center.

VCs came to a similar conclusion when asked for an assessment of the equity capital availability in Vienna. They also see funding instruments for the early stages provided by FFG and AWS as highly important and potentially effective, but they are also critical of their overregulation and inflexibility in practice, i.e., the short pay-back period, restrictions of combining the public funding with private equity funding. VCs view FFG and AWS programs as essentially *debt instruments,* since the funding has to be paid back within one or two years, a period considered too short for many startup companies. This is especially because banks do not provide loans for 20 percent of the risk which would be important for startups without the respective financial backing.

Venture capitalists furthermore cast a critical eye on the handful of large technology-oriented corporations based in Austria that, in general, do not have much interest in cooperating and partnering with young and highly innovative entrepreneurs, even if such a cooperation would speed up their own innovation. All in all, VCs believe while there is sufficient venture money available in Europe for promising startups, there is perhaps a greater reluctance to enter the German-speaking countries because of their risk-averse culture, and even more so for Austria because of its small domestic market.

The opinion of public and quasi-public funding organizations about seed and early stage funding schemes is mostly similar to that of VCs and angels. There are, however, some differences among the funding organizations in terms of their attitudes towards, and willingness to collaborate with, business angels. They argue that since both they and angel investors are investing in early stage startups, greater collaboration should yield increased synergies. Their experience of helping to fund startups in their growth phase in Vienna is rather negative since the regulatory framework repels many international investors, on the one hand, and entrepreneurs are not open to truly innovative, radical products. In many cases the companies in Vienna are too small for a one to five million EUR investment. Therefore they see a need for a broader basis where more investment companies would stimulate the market. For example, Speedinvest, is perceived as a potentially highly effective new actor, but would need more competitors in order to stimulate more dynamic development.

4.2 Is there a need for changes in policies affecting the startup ecosystem?

To the extent the ecosystem in Vienna is insufficiently attractive for international investors, the question of policy comes into the discussion. Generally speaking all of the interviewed investors concluded that a few political actors in Austria show signs of willingness to bring startups on the political agenda and are willing to support an entrepreneur- friendly policy in Austria. The current political reality, however, does not reflect that interest and vision. Statements from interviewees about policies that positively affected the startup ecosystem were rare, though business angels tended to be relatively more positive than VCs. In particular, they identified growing interest in coordination between public and private investment as a promising sign. One example is a shared investment between AWS, Speedinvest, KWF and Constantia Industries in the Carinthian startup bitmovin. This venture is a spin-off of Alpen-Adria-University

Klagenfurt where the commonly invested money was pooled together in order to allow a market entry in Europe and the U.S. Business angels also see a benefit of events like the pioneers festival which raised awareness of political leaders of the benefits of tech-based spin-offs over the years. In the beginning politicians did not have the festival on their radar but more and more politicians are using it as a platform, and some were even speaking at the festival. Even if the number of successful pitches is relatively low at such events, the more important effect is reached via media coverage and follow-up activities and initiatives after the event.

Business angels, VCs and also public funding organizations concur, when addressing implementation of startup-friendly policies, that there is a lack of commitment and attention to how they are implemented in practice. There seem to be signs for policy changes but nothing happens quickly and politicians do not speak with one voice. One of the more often mentioned weaknesses is the lack of tax incentives for investors, in contrast to countries such as the UK. This would require a political commitment that does not currently exist. Many interview partners observed that politicians pay 'lip service' to startup-friendly policy initiatives, but take no real actions.

VCs addressed weaknesses of particular instruments or legal vehicles, for example of the Mittelstandsfinanzierungsgesellschaft AG (founded in 1994) where the EU detected legal problems with allowances (beihilfenrechtliche Probleme). Such supranational issues impede and disrupt some of the few mechanisms in place that help the markets between investors and founders work more efficiently and smoothly.

4.3 Is the current regulatory framework conducive to startups?

According to our interview partners the regulatory framework discourages startup activity. One example is the lack of suitable tax incentives that render Austria less competitive for investors. The example of the recently closed loss-sharing instrument ("Verlustbeteiligung") as a consequence of the newly introduced tax reform has been brought to our attention and there exists no comparable instrument. Another issue addressed especially by business angels and VCs is the inflexible bureaucracy when it comes to corporate forms or legal vehicles (i.e. GmbH, GesbR, KG, OG) which are perceived to be overregulated and burdensome compared to other countries within the EU. The lengthy time, frustration and out-of-pocket expense needed to receive a business authorization in Austria, and the highly regulated notary market perceived to be not well suited for international deals, together are seen by investors as major disadvantages compared to other high tech startup ecosystems in Europe. Investors' critique of the regulatory framework is broad. It spans tax and regulatory issues to the need for reform of the educational system in Austria. The general perception of the interviewed investors is relatively negative and closely linked to some structural problems mentioned earlier. It seems that a systematic and strategic assessment of the regulatory framework affecting startups – to make it smarter, more streamlined, less costly, and easier to navigate – should help to give the Vienna ecosystem needed competitive advantages.

4.4 What criteria do Viennese equity investors use?

Investment criteria form the basis for investors' decisions on whether or not to provide equity funding to a given startup. Understandably, these criteria may differ among different types of investors. Business angels invest their own capital and are therefore more interested in the long-term return of investments whereas VCs look for short-term leverage and need to consider different interests of those who are providing money for the respective fund. Finally, public funding organizations also often need to consider and serve broader public interests.

Business angels are interested in investment projects where they can be involved and at the level of about 300,000 to 400,000 EUR investments. Everything beyond that amount is more VC-oriented. Business angel investments are perceived to be more linked to ICT-related startups since the funding needs are typically smaller than, say, biotech startups. Also, many Austrian business angels were ICT zero entrepreneurs and have an interest in better understanding of ICT projects. But there are more and more references of non-ICT related business angel investments, including non high-tech startup investments (see e.g. AWS i2 Business Angels Platform[1]). The longer the time business angels have been 'in the business', the more selective they become, after having experienced some (inevitable) negative results. According to business angels we interviewed, there is a combination of three factors involved when it comes to an investment decision: the unique selling point (USP), the structure, and the organization. In order to understand the USP, business angels need to know the market and need to have an overview about the available technologies. The structure includes more than a business plan and with organization business angels are addressing the importance of the team composition. Business angels are 'people-oriented' and focus more on the quality of the team than the new idea. There is a common notion that good ideas can only be developed in a good team. The benefit for startups of having a business angel as an investor is that business angels bring their own experience and know-how and provide their own network. When it comes to the facilitation of other services and consulting, ethical issues have been raised. Some have asserted that young entrepreneurs quite often need to pay extra fees to the investor-procured consultants, which might charge higher fees than other service providers.

VCs emphasize two main criteria: the size of the market for the developed product and the team. Regarding the team, VCs are particularly focused on the *composition of the team* and the *experience* of the individual team members. The composition of the team should ideally be more diverse in the skill sets and include marketing and sales experts from the start. If the team is not sufficiently diverse at the beginning, it needs to be willing to add people with the needed expertise and experience.

Funding organizations provided a longer list of investment criteria including the degree of innovation, the novelty of the idea, the market potential, the network and diligence as the most needed ingredients.

[1] See: http://www.awsg.at/Content.Node/risikokapital/i2-business-angels/46841.php

4.5 How strong are the connections between investors and entrepreneurs in Vienna?

The perception of the overall Vienna startup ecosystem among investors is that it is relatively easy for entrepreneurs to 'connect' with public funding organizations such as AWS and FFG, and with business angels in the seed or very early stages. But for later stages it is difficult for startups to identify funding sources because of lack of incentives for international VC investors to enter the Vienna market, along with the relatively small amount of VC available at the later growth stages from domestic investors. Business angels, in particular, seem to be highly active in connecting with potential entrepreneurs; there are umbrella organizations for business angels such as the AAIA (Austrian Angel Investors Association[2]) or startup300[3] where investors and entrepreneurs find a forum to meet and exchange. Such organizations fulfill different functions: they help connect those who are searching for money and those who want to invest; they provide opportunities for business angels to share common interests and to find strategic investment partners. Some of the organizations are defined in a way that business angels should bring in their network, and their know-how and help to collectively gather expertise under the single umbrella. Startup300, for example, tries to activate and integrate all the well-known business angels in order to bundle their different profiles which might lead to a better transparency of the market. Many of the interviewed business angels indicated that permanent meetings with stakeholders in the scene are extremely important to connect investors and startups. Events and happenings are ideal places for selecting people and scanning the market as well as pitches and incubators. The common notion of business angels is that they do not need to search for interesting startups; rather, startups are contacting them actively. This might be a consequence of the limited number of business angels in the Vienna ecosystem.

VCs confirmed the fact that founders are actively approaching them even if the funds are already closed. This seems to be a consequence of the existing lack of available VC funds in the Vienna ecosystem. There is also a common understanding among VCs that founders need to do their 'homework' in terms of what investors will want to see, and whether the startup matches up with the investor's profile and criteria prior to contacting an investor. Also, VCs are less enthusiastic about using 'events' to connect with founders. In their experience, these are good for PR, but not necessarily for the deal flow.

4.6 What suggestions do investors have for strengthening Vienna's ecosystem?

Investors look at the ecosystem from their professional side and put on more critical glasses when asked for strengths and weaknesses of the Vienna ecosystem. Thus they were asked in the interviews to provide concrete suggestions for strengthening Vienna's ecosystem.

One such suggestion is related to the perception that only a few political actors in Austria show signs of willingness to bring startups onto the political agenda and are willing to support an entrepreneur-friendly policy in Austria; hence the current political *reality* looks quite different. One suggestion is that state secretary Dr. Mahrer should create an ongoing forum, or dialogue, in which young entrepreneurs and established firms come together with politicians and work out a strategy or vision for the startup scene in Austria for the next 20 to 50 years. Such a platform would initiate a dialogue where different

2 See: http://www.aaia.at/en/home/
3 See: http://startup300.at/

parties would both contribute ideas and benefit from the ideas offered by the other parties. For this to work would require relationships of trust and effective communication skills to be first developed among all the stakeholders, using skilled and experienced mediators. These kinds of processes could result, however, in a forum that can help the public sector identify broadly supported, implementable ideas for Vienna so as to further develop the city as a startup hub.

A number of our interview partners mentioned reforms of existing tax policy to help increase the attractiveness of Vienna startups for venture capitalists and corporate ventures. The idea put forward includes the development of tax reforms adapted from successful models in other countries and tailored for the situation in Austria. These might include, for example, the capital gain tax relief for investors and reduction of corporate tax in the UK[4], or the Start-up NY program[5] in the U.S. which includes tax credits for investment.

Still another idea would be to provide incentives for large state-owned or semi-public Austrian corporations, such as the ORF or Wiener Stadtwerke, to reinvest some of their profits into venture funds to support promising startups in Austria.

One of the weaknesses of the Vienna ecosystem which is widely agreed upon in the investment community is the lack of financial capital for the *growth phase*. A suggestion put forward by investors is for the federal government to create a pool of about 100 million EUR of venture funds that would be administered by a highly experienced private management team. One direct effect would be that the creation of this funding pool would signal willingness to support entrepreneurs to survive the 'dead valley' phase and would therefore most likely attract additional private sector capital if combined with tax incentives for investors. Such a coordinated venture capital pool would function as a real venture capital instrument and not as a hybrid debt-related instrument where entrepreneurs have to pay back money within a short period of time. Entrepreneurs would be required to reach a positive return on investment within five years, helping to ensure that only product ideas with a strong, most likely international, market potential would receive funding, with an expectation of growth in turnover and of job creation in the long run. A related indirect effect would be that such a shift towards international markets would also help to attract international VCs to invest in Vienna. Pooling state and private money would also rectify some detected conflict of interests involved in some of the AWS instruments where the money for the funds is coming from federal ministries that operate AWS.

The regulatory framework has been assessed as overregulated and too bureaucratic. Some interview partners alluded to unclear and/or split competences and responsibilities, making it difficult to identify where to go for particular startup-related issues and problems. Therefore one suggestion focuses on more comprehensive coordination among different political actors as well as administrative units, and a commitment for review and reform at all edges of the ecosystem. Two specific items have been identified where changes would be helpful. The first is the call for a stock market law reform in order to create a micro capital segment where companies with a market value of 5-10 million EUR would be

4 See: https://www.gov.uk/capital-gains-tax/overview
5 See: https://startup.ny.gov/

allowed to 'go public'. Such a reform would also help to bring banks back into the market, helping to replenish the stock of liquid assets. The second item addresses the problem of internationally uncompetitive corporate forms or legal vehicles in Austria (i.e. GmbH, GesbR, KG, OG) that limits entrepreneurs' ability to secure equity funding on the international market. With a reform towards more attractive and comparable corporate forms, the ongoing out-migration of funds to other countries could be prevented. There is also a need for new legal instruments (e.g. the former Mittelstandsfinanzierungsgesellschaft AG mentioned earlier) in order to be able to create larger funds in Austria. There are already some pooling initiatives with business angel capital in place, such as startup300, but there is room for more comprehensive and flexible forms of pooling. If such initiatives are absent, investors will lack the incentive to create larger funds here in Austria, and likely lead to their going to other countries, such as Luxembourg. The positive effect of such new initiatives would be that startups that will and want to grow would find circumstances in Austria that would make it easier for them to stay, pay taxes and create jobs in the medium- and long-run.

Section 5. Recommendations

Our investigations of: (1) the trends and sources of VC and other equity funding for startups in the Vienna region, (2) the structure of Vienna's investment community, (3) the critical success factors of three of the most dynamic and successful European startup centers, and (4) the perceptions of investors about the quality of the Vienna startup ecosystem and their views of how it can be strengthened, provide us with the basis for making a number of recommendations.

The recommendations that follow are not limited to just actions that the WKW can take. Rather they take into account actions that will need to be taken by a broader and more diverse set of actors, all of whom have a stake in working together in order to help Vienna become the next dynamic European startup hub.

We purposely refrain in most cases from specifying the division of responsibilities for the actions we recommend. 'Who should do what' will ultimately involve discussion and negotiation about commitment of resources, legal authorities, political interests and political relationships. The outcomes of these discussions go well beyond our wisdom and advising capacity.

> **Establish an ongoing platform** (forum, roundtable) that brings together individuals from the key stakeholder groups – investors, entrepreneurs, public policy officials, business organizations (e.g., WKW) – whose responsibilities are to harmonize goals for Vienna becoming a startup hub, suggest strategies and actions of how the startup ecosystem can/should be improved, assign appropriate responsibilities based upon competencies and legal authority, mediate conflicts among stakeholder groups, and monitor progress on implementation. **There should be a leader of the platform that enjoys broad support and respect among the various groups and can successfully build support from both the political and business communities.**

Create a pool of public and private funds, on the order of 100M EUR, specifically targeting mid- to late-stage tech-based startups. There is a sufficient supply of seed funding for promising startups. The funding needs of companies after the seed and early stages are larger, thus requiring a larger pool than is currently available. We suggest using public funds to match private funding. Such an arrangement would have the advantage of reducing the risk to VCs and angels, and at the same time help to attract additional international investors. Having professional, highly experienced, private sector management of the fund would send an important signal to the investment community. The sources of public funds might be from the city of Vienna, a number of quasi-public but profit-making organizations (e.g., ORF, WienEnergie, Wien Holding), and/or the federal government.

Establish a one-stop office within Vienna city government for assisting and supporting startup businesses. The purpose of such an office is to connect startups with a wide range of both public and private resources, including finding suitable space, infrastructure, mentors, accessing investors, events, and networking. This might be modeled on the very successful program in Amsterdam, Startup Amsterdam, in which a quick response team is formed for each startup, co-led by a public and private official. The city of Berlin's Infrastructure/Founder Campus program, in partnership with Exocet Berlin GmbH, fills similar startup needs, and has also been very successful.

Encourage and support individual angel investors to form Super Angel Funds and Angel Platforms in Vienna. Angel investors fill an important and somewhat different niche from VCs within the broader investor community. They can be even more effective by pooling their separate assets, with professional management support, to enable larger investments to be made and with reduced risk, to promising mid- and late-stage businesses for which equity capital is most scarce in Vienna. The startup300 initiative is an excellent move in this direction, and we would be wise to build upon it.

Reform the existing government's tax policy that discourages VCs and other equity providers from operating in Vienna and Austria, in comparison to other locations in Europe. Providing tax deductions for equity investments in Austria, and reinstating government guarantees to investors in order to reduce their risk of loss should be 'on the table'. Such reforms would not only encourage a higher incidence of investments in startups by Austrians, but also would be able to attract more substantial international investors to Austria, paving the way for a healthy development of the domestic equity market.

Reduce the bureaucratic 'red tape' faced by foreign investors that lengthens the time needed and out-of-pocket costs for incorporation of new businesses in Austria. Tech-based startups also often need to be able to quickly procure very specialized scientific and technical skills that are available from non-EU countries. Further reductions in the time for non-EU professionals to gain residence (work) permits would help to make Austria relatively more competitive with other EU countries.

Engage in further educational reform at all levels, to better prepare the next generation of graduates with the skills and attitudes needed for entrepreneurship. This is a long-term effort, but will help to change the existing culture in Austria towards one of greater dynamism, openness, competition and risk-taking, that has proven to have helped Berlin, for example, shed its conservative mantel and become one of Europe's leading startup centers in a relatively short time.

Design and implement a systematic marketing campaign to identify (brand) Vienna as the next dynamic startup center in Europe. It is much more than the Hapsburgs, schnitzels, and opera! The message should be that Vienna has 'buzz', is innovative, is open, has a growing number of risk-taking entrepreneurs attracted to Vienna as a great place to live, and has both public and private sector programs to support making Vienna extremely 'startup friendly'. This is a message that is complementary to Vienna as a Smart City, but it is distinct.

Appendix A

List of Interviewees (alphabetic order)

Section 2:

Anonymous

Mag. Berthold Baurek-Karlic (Venionaire Capital)

Ing. Mag. Karl Schiller (AWS)

Prok. Mag. Alexander Stegbauer (Raiffeisen Bank)

Walter Swoboda (Erste Bank)

Johannes Waldstein (Finalogic Business Technologies)

Nina Woss (Speedinvest)

Section 4:

DI Michael Altrichter (Business Angel and Impact Investor)

Mag. Berthold Baurek-Karlic (Venionaire Capital)

Dr. Michael Cortelletti (Business Angel)

DI Burkhard Feurstein (Gamma Capital Partners)

Dr. Paul Martin Frentz (Frentz CCC Ltd.)

Mag. Nikolaus Futter (Compass Gruppe, Business Angel)

Martin Gaiger (Telekurier Online Medien GmbH 6 Co.KG)

Dr. Christoph Haimberger (3TS Capital Partners LTD)

Dr. Philipp Kinsky (Herbst Kinsky Rechtsanwälte GmbH)

Bernhard Lehner (startup300, i5invest, Business Angel)

Dr. Jürgen Marchart (AVCO – Austrian Private Equity and Venture Capital Organisation)

Mag. Jürgen Milde-Ennöckl (tecnet equity NÖ BeteiligungsGmbH)

Mag. Harald Schürz (Wiener Wachstumsfonds, Athena Wien Beteiligungen AG)

Dr. Peter Stebe (nextSociety)

Dr. Ernst Ungersbäck (FSPVentures)

Appendix B

Interview Protocol for Section 4

High tech Start-up Ecosystem Vienna

(An entrepreneurial ecosystem consists of individuals and institutions being interconnected. Facilitating the linkages between these actors is a key for a healthy entrepreneurial ecosystem (Wilson 2015))

> If you hear a statement like: "When Vienna is compared to other international and European cities it is perceived to have a healthy high-tech start-up ecosystem" would you agree? If yes, why? If no, why not?
>
> Do you think the ecosystem for start-ups in Vienna has been recently improving?
>
> Do you think there is a scarcity of high quality high-tech start-ups in Vienna?
>
> Do you think the number has been improving within the last few years?
>
> What are the most positive features of the Vienna ecosystem supporting high-tech start-ups?
>
> What are principal barriers preventing a more dynamic development of high-tech start-ups in Vienna?

Finance Availability

> Do you think there is sufficient private equity available for the number of high-tech start-ups located in Vienna?
>
> For Early Stage businesses (seed phase, start-up phase, first stage)?
>
> For Expansion Stage businesses (second, third, fourth stage)?
>
> Is there sufficient public sector equity funding available for high-tech start-ups in Vienna?
>
> Toward which technology sectors do you think public sector funding should be targeted?
>
> Are there particular technology sectors that seem to have sufficient equity investors?
>
> Why do other technology sectors not attract enough equity investment?

Policy

Do you think that we should have a government policy that when a start-up receives private sector equity in its early stage, there is matching funding from the public sector?

If yes:

What do you think is the appropriate ratio for matching public funding with private funding for early stage start-ups?

How would you describe the current degree of coordination between public and private investment in Austria/Vienna?

How do you think the coordination could be improved?

Are there any government policy initiatives you would like to see for supporting early stage high- tech start-ups in Vienna?

Regulatory Framework

Do you believe that there are undesirable regulatory restrictions on private equity investment in the early stage phases in Austria? Yes/No

If yes:

What kinds of restrictions are limiting private equity investment in the early stages?

Would changes in existing tax laws make Vienna more attractive for private investors?

Which changes would you suggest?

Do you perceive the corporate requirements (e.g. set-up costs) to be a barrier for high-tech start-ups in Austria/Vienna?

Investment Criteria

Would you find investing in an early-stage high-tech start-up more attractive if it has already received public sector funding?

Are there other types of services that you think early-stage high-tech start-ups in Vienna should receive to increase their chances of success? (List the specific kinds of services)

Which actors would be most appropriate for providing each of these kinds of services?

Is there a scarcity of providers of these services to high tech start-ups in Vienna?

Does your organization provide any non-financial services to start-ups in which you make investments? Yes/No

If yes, what kinds of services?

If no, why not?

Investor – start-up link

How do you generally identify prospective high-tech start-up targets in Vienna?

Can you think of how there can be improved connections between potential investors and potential high-tech start-ups in Vienna?

Vienna as a high-tech start-up location

Please assess the factors below in terms of their strength for making Vienna attractive for high-tech start-ups. (1=very strong; 5=very weak):

	1	2	3	4	5
Specialized services for high-tech start-ups (e.g. management consulting, marketing, etc.)					
Positive spillovers for peers					
Equity (available capital)					
Seedbed for serial entrepreneurs					
Entrepreneurial spirit					
High-tech specific infrastructure (labs, cleanrooms)					
Entrepreneurial ecosystem					
Social capital (i.e. trust, civic mindedness, etc.)					
Attractiveness as a high-tech start-up location					
Other, please specify:___________________________					

Can you (help us) identify other prominent actors in the start-up investment ecosystem in Vienna?

Appendix C

Definitions and Examples of Models of Equity Financing for Startups

Venture Capital Firms (VCs) are firms paid to manage institutional capital. They invest money on behalf of institutional limited partner investors such as endowments, university funds, government pension funds, non-profits. They typically invest in most rounds of pre-IPO funding. Typically, investments start at $1M. To receive VC funding, startups must accept restrictions from the VC firm, including allowing the VC firm to have majority board control and minimum exit levels. Examples: Andreessen Horowitz (http://a16z.com), Sequoia Capital (http:77sequoiacap.com), and Funders Club (fundersclub.com).

Micro VCs (or Seed Stage VCs) are a recently emerging type of VC firm that specialize in making micro capital investments to startups in their seed stage. The typical size of these investments are between $100,000 and $1M. Like full-fledged VCs, they are staffed by full time professionals. Many micro VCs, because of their smaller size and market reach, target their investments to local or regional startups. Micro VCs often require similar restrictions on, and control of, the startup business. Examples: Floodgate (http://www.floodgate.com) and High Tech Grunderfonds (HTGF) (http://high-tech-gruenderfonds.de/en/).

Corporate Venture Capital (CVC) describe occurrences when a larger corporation (or government organizations or a higher education institution) directly takes an equity stake in a startup, without using the services of third party investment firms. The CVC may provide management and marketing expertise to the startup. Example: Google Venture (https://www.gv.com/). Other CVCs of companies that use this model include Intel Capital, CISCO, Siemens Venture Capital, Johnson and Johnson Development Corporation, and Eli Lilly Corporate Business Development.

Government Agency as VC is a public sector organization that provides public funds, often as matching funds to private funds, to support promising startups. The management of these can be within the public sector, but more recently there is a growing trend of hiring private professionals to manage the fund.

Angels/Super Angels are wealthy individuals or families who provide capital for a business startup, usually in exchange for either convertible debt or ownership equity. Angels normally invest only their own funds rather than bundle funds from other sources. Angel capital helps to fill the gap in seed funding between 'friends and family' of the entrepreneur, and VCs. Although there is no standard amount of angel investments, the general range is between $50,000 and $1M. Super Angels refer to a subset of Angels who employ a professional to advise investment decisions, and have an active portfolio of 20 or more startup companies, are willing to invest larger amounts in a number of companies. Examples: SVAngel (http:/svangel.com); CommonAngels (http:/commonangels.com/); HubAngels (http://hubangels.com).

Angel and Super Angel Funds (or Angel Groups) are groups of angels who pool their funds and invest as a team. Professional managers are hired to make investment decisions for the fund. This model approaches VCs in terms of their structure, operation., and investment criteria. Examples: Tech Coast Angels (www.techcoastangels.com); New York Angels (http://www.newyorkangels.com/).

Angel Platforms support business angel activities, but also provide various services to entrepreneurs, startups, and job-seekers desiring to work in startups. An important function is to help connect startups with angel investors, but also assist investors in discovering promising companies, and advise startups in management, closing investments, and exiting. Example: Gust (https://gust.com/).

Crowd Funding is an investment strategy to raise capital for investments in startups by engaging a large number of small investors. The investment can be either debt-based or equity-based. Often crowd funding is used by a startup to raise capital for it alone, but there is a growing trend of using professional investment firms to raise capital in this way for a portfolio of startups.

Appendix D

The Global Startup Ecosystem Ranking

	2015	2014
1.	Silicon Valley	1
2.	New York City	5
3.	Los Angeles	3
4.	Boston	6
5.	Tel Aviv	2
6.	London	7
7.	Chicago	10
8.	Seattle	4
9.	Berlin	15
10.	Singapore	17
11.	Paris	11
12.	Sao Paulo	13
13.	Moscow	14
14.	Austin	Unranked
15.	Bangalore	19
16.	Sydney	12
17.	Toronto	8
18.	Vancouver	9
19.	Amsterdam	Unranked
20.	Montreal	Unranked

Source: Compass 2015, *The Global Startup Ecosystem Ranking, 2015*

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