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FINAL REPORT

D3 “Assessing the external perceptions about the entrepreneurial ecosystem of AMP and the key variables to work on”

Draft 1.0

CAREM / Urban Economic Innovation / Faculty of Business and
Economics
2018

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1. Introduction

This report contains an analysis of the AMP¹'s entrepreneurial ecosystem. It aims to assess the external perceptions about the entrepreneurial ecosystem of the Metropolitan Area of Porto and the key variables to work on. We systematically analyse the perception of Porto as entrepreneurial ecosystem in the AMP itself, based social media analysis and on interviews with entrepreneurs and other stakeholders in the Porto ecosystem. As a reference case, we also conducted a survey and interviews in Amsterdam. This helps to compare the situation in AMP with that in Amsterdam. The analysis helped to understand the current strengths and weaknesses of the AMP's ecosystem, seen from the eyes of insiders and outsiders. In particular, we focused on two key features: internationalisation and the role of the wider region.

Research for this report was conducted in three steps. First, we conducted an analysis of social media, identifying how Porto and its ecosystems are being mentioned or discussed online. Second, we conducted interviews with a number of stakeholders (universities, regional authorities, innovation agencies, incubation centres, investment agencies, start-ups), both in Amsterdam and in the AMP. During the interviews, we discussed the current state of affairs, the strengths, the weaknesses, and development path of the ecosystems. Also, we identified possible steps and actions to improve the AMP ecosystem and its attractiveness for international start-ups and scale-ups. Third, based on the findings of these interviews, we sent a survey to start-ups and scale-ups in Amsterdam, and in the AMP. The findings are backed up with existing studies, literature and web sources on Porto's ecosystem.

This report is structured as follows: first, in section 2, we present our analytical framework, Isenberg's model of entrepreneurial ecosystems, and complement the model with the two cross-cutting features that we studied in particular: internationalisation and the role of the wider region.

In Section 3, we summarize the main perceptions regarding the six elements of the model, applied to the Porto region.

Section 4 contains the results of a short survey that we sent out to players in the ecosystems of Porto and Amsterdam.

Section 5 contains a summary of the findings of the social media analysis (for a more elaborated version we refer to Deliverable D1 that contains all the details).

Section 6, finally, presents some building blocks to create a roadmap with actions and solutions to improve the AMP's ecosystem and its international perception. This part is based on a visit of the research team to AMP in April 2018, to discuss the final results of the analysis in a meeting with key stakeholders in the AMP's entrepreneurial ecosystem.

¹ Área Metropolitana do Porto

2. Conceptual framework

To describe and analyse the entrepreneurship ecosystem of the region, we adapted the model of Isenberg², that identifies six interrelated aspects: policy, finance, culture, supports, human capital, and markets. Each aspect is represented by a circle (figure 2.1), and contains various elements. It is important to emphasize that the aim of our study is not to analyse the ecosystem of the AMP in its entirety, but rather to focus on the international positioning and attractiveness of the Metropolitan Area of Porto (AMP). Hence, in our analysis, the spotlight is on two key aspects of the ecosystem: internationalisation, and the role of the wider region (as opposed to studying the city only). The latter point will come back in section 6, about the roadmap for the AMP.

Figure 2.1 Aspects of the entrepreneurship ecosystem, adapted



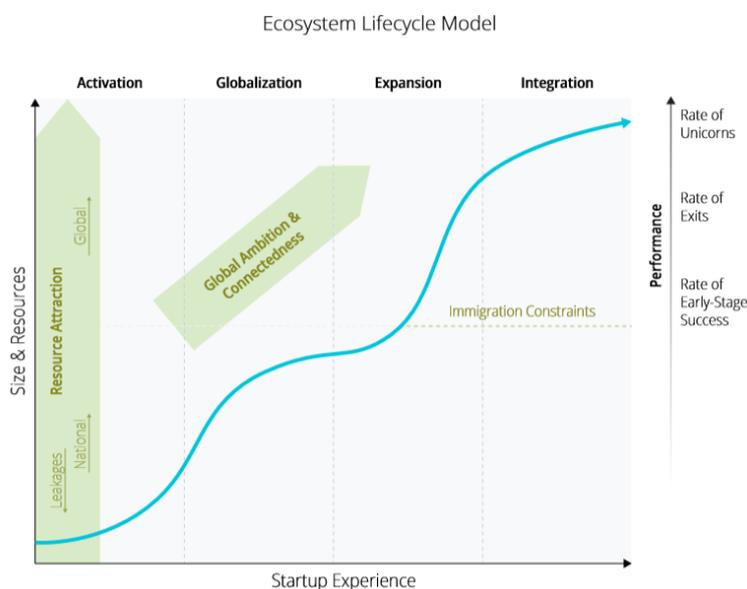
2.1 Stages in the ecosystem

The maturity of urban ecosystems varies considerably. Startup Genome (2017)³ identifies four stages (depicted in figure 2.2). The stages are characterized by the size of the system (number of start-ups); the ability to attract resources, nationally and abroad; and the number of exits.

² Isenberg, D. (2011). The entrepreneurship ecosystem strategy as a new paradigm for economic policy: principles for cultivating entrepreneurship, the Babson Entrepreneurship Ecosystem Project, Babson College, Babson Park: MA.

³ <https://startupgenome.com/>

Figure 2.2 The ecosystem lifecycle model



1. Activation stage. Cities in this stage have a low number of start-ups (1000 or less); limited local experiences, and significant resource gaps; there are few exits.
2. Globalisation stage. Number of start-ups rises to 2000; significant development of international markets; some larger exits (over 100 million) have put the ecosystem on the AMP; the ecosystem is attracting resources and start-ups from nearby regions.
3. Expansion stage, There are more than 2000 start-ups; there have been several significant multi-million exits; it attracts international resources, but there are still some gaps in funding and global connectedness to make the next step and have multi-billion exits.
4. Integration stage. Grown well beyond 2000 start-ups; balanced resources that are competitive with other top ecosystems in the world.

Based on this scale, Porto is in the activation stage (based on data supplied on ScaleUp Porto website)⁴, and the Amsterdam region is in the globalisation stage. In the remainder of this report, we will no more refer to this particular stages model, but rather go more in detail on Porto's ecosystem setup. In the survey, we asked respondents to give their view on the maturity of both ecosystems (see section 4).

⁴ <https://classic.mapme.com/scaleupporto>

3. Porto's ecosystem analysed

3.1 Policy

Start-up and scale-up policies play out on the national and the local level. Over the last decade, the City of Porto has increasingly emphasised the promotion of entrepreneurship as economic priority. A number of initiatives have seen the light, including the ScaleUp Porto programme. On the political level of the city, there seems to be ample support for further promotion of entrepreneurship. Also on the national level, promoting start-ups and scale-ups it is high on the agenda. In 2016, the government launched the StartUp Portugal programme, a 4-year plan to support entrepreneurs with the growth of their companies, to increase job creation and economic value, focusing on three areas of operation: ecosystem, funding, and internationalisation. Among the initiatives are Startup Voucher, Incubation Voucher and the co-financing of Business Angels. Our interviewees were particularly grateful for the Startup Voucher, a grant that gives entrepreneurs a low but secure income during the first months of their venture. One interviewee received 600 euro per month (for a couple of months) during his Masters study, to develop his company: in his words, it was critical to get it off the ground.

At the same time, some interviewees indicate that more action is needed to facilitate entrepreneurship, especially from the national government. "Politicians do a lot of talking, many instruments have been announced but procedures and bureaucracy are too slow, instruments need to be available more quickly." In the view of some, the introduction of the announced co-found instrument, that should enable the matching of public and private funding, takes too long.

Most actions so far come from the national or the city level. On the regional level, there are no explicit policies. However, the AMP is considered (by various interviewees) to be supportive. According to the incubator, "the AMP acknowledges us, we are partners, they consult us for challenges and co-promote us, they are very supportive". But although there is good collaboration, "AMP could do more, they sometimes work slowly and there is a lot of bureaucracy".

It is also mentioned that it is hard to bring regional players together, as a regional level of policy is missing, and "each local government works individually".

National and local start-up policy is also integrated in the European ambition to become more entrepreneurial. The ScaleUp Porto programme is linked to ScaleUp for Europe⁵, a network of cities to promote the creation and development of a national and international network of support for the scale-up companies of the city ecosystem. It wants to provide entrepreneurs with information about cities' context and business environment, and to promote their internationalisation effort. It should become a unique platform to help companies build reputation credibility and increase sales opportunities.

3.2 Finance

Is there sufficient capital available for the thriving start-up scene in Porto? The picture is mixed. On the one hand, there is a rich (and growing) number and variety of providers of funding (see box 2 for an overview). For funding, start-ups can turn to grants and subsidies, crowd investment platforms, angel

⁵ <http://scaleupporto.pt/activity/scaleup-for-europe/>

investors, and venture capital funds. Overall, national and European public funding is still very important.

Venture capital from the private sector is growing, in particular for the early stage start-ups. In recent years, several larger Portuguese companies have started to invest in start-ups and created their own funds and there are some good examples of spin-offs. In general, attracting capital is not considered to be a problem: “if you have a good idea, you will find capital”, as one interviewee put it. The turning point for investment is around one million euro. From then on, finding capital becomes more difficult. One reason is that domestic investors still display risk aversity, preferring traditional areas like real estate. Investment for bigger ventures has to come from abroad but international investors are hard to find as they tend to consider the Portuguese market as too small and too risky.

At the same time it is not easy for Portuguese companies to find capital abroad. Network events are being planned to attract foreign investors, but this is not a structural solution. Firms tend to rely on personal contacts. AddVolt is an example of a start-up that successfully managed to secure investments from Germany. They were successful because their main German client was convinced of the product, and they managed to convince investors. What also seems to lack in Porto – compared to more mature ecosystems – are serial entrepreneurs that re-invest after an exit.

Overall it can be said that funding for larger ventures is still a problem in Porto and Portugal as a whole. Public funding still plays an important role and the financial market has to become more mature.

Box 2: Capital sources¹

Grants & Subventions

- [StartUP Voucher](#) is a new initiative from the Portuguese Government ready to push for good ideas by enabling, for one year, the support and tools that can help you develop your idea into a project, that could become a start-up.
- [Portugal 2020](#): a partnership agreement between Portugal and the European Commission to contribute to economic, and social development through 5 European funds. Till 2020 Portugal will receive 25 billion euro.
- [JESSICA Holding Fund Portugal](#) is operationalizing the JESSICA initiative in Portugal. JESSICA – Joint European Support for Sustainable Investment in City Areas, is an initiative of the European Commission developed in co-operation with the European Investment Bank (EIB) and the Council of Europe Development Bank (CEB). It supports sustainable urban development and regeneration through financial engineering mechanisms.
- [HORIZON 2020](#) is the biggest EU Research and Innovation programme ever with nearly 80 billion euro of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract.
- [FINICIA](#) is a program that facilitates the access to financing solutions and provides assistance for different entrepreneurial projects which are close to the market or with a high growth potential. They provide their services in the creation phase of the company, in companies with fewer than 4 years of activity and in projects with local interest.
- [Turismo de Portugal](#), through subsidiary companies, implements venture capital operations by taking shareholdings in companies operating within the tourism sector with the prospect of valorization over the medium-term. Also, administers, manages and represents closed real estate investment funds whose intervention has enabled modernization and rescaling of the hotel offer, demonstrating that the tourism sector is a strategic area for the country.

Crowd Investing Platforms

- [Seedrs](#) makes it possible for anyone to invest in businesses they believe in and share in their success.
- [Raize](#): an alternative source of finance for businesses and investment for individuals, made of people and companies.

Angel Investors

In the Porto region, you can find a number of business angels that are now co-investing with the government. Since this is a recent initiative from the government, there is still not much information about them, but here is a list:

- Alfabeto Prodigio, Lda.
- Argumentodisseia – Unipessoal, Lda.
- Casper Ventures SGPS Lda
- Creative Wings SGPS S.A
- Distintoparadigma, Lda
- Green Capital SGPS S.A
- IDEIAS GLACIARES
- Indextalent II Lda
- Iniciativa Incógnita, Lda
- iSmart Ventures
- Meiril
- Startupdiscoveries SGPS S.A

Venture Capital Investors

- [Portugal Ventures](#) is a Venture Capital firm, focusing its investments in innovative, scientific and technology-based companies as well as in companies from the more traditional Portuguese tourism and industrial sectors, with significant competitive advantages and export oriented to global markets.
- [Caixa Capital](#) is a pioneering operator in the Portuguese market, with about 500 million euro under management and a total potential capital of 700 million euro for its managed funds.
- [Pathena](#) is a specialized investment firm focused on boosting the success of Information Technology companies. Pathena partners have strong backgrounds and expertise both as entrepreneurs and as investors in the IT field, with a proven track record.
- [Beta Capital](#), a privately held venture fund.

3.3 Culture

Culture is the backdrop of all elements of an entrepreneurial ecosystem and directly affects its operations and growth. We have indications that a culture of entrepreneurship is strongly developing in the last years. For a growing number of young people, it has become more common to aspire a career as entrepreneur, rather than working for a (large) employer with a fixed contract. This change is relatively recent: according to one of the start-ups we interviewed it was not common to start a business when he left university in 2013. Since, entrepreneurship has gained a more positive image, linked to an independent lifestyle. Like in many other European cities, the “entrepreneur” lifestyle and the reputation are among the key reasons to start a business in Porto.

Nevertheless, the entrepreneurial culture in Porto seems to have a specific “couleur locale”. People from Porto describe themselves as “rather traditional”. They value security, family and social relations highly, which might result in less radical ambitions regarding company growth, and more conservative attitudes towards risk taking. “Money is not everything”, and quality of life is high, even on a relatively modest income. The culture is considered still as one that leans towards preferring security over risk taking, and a strong competitive mindset is missing. This might explain the relatively low number of firms that grow very fast and/or become listed or internationalised. So far, the ecosystem produced a few big exits in the past. “But we need new ones, we are still at the beginning”, according to a start-up entrepreneur.

Another aspect that was highlighted quite often was the very modest culture of communicating. Success stories are not communicated extensively, there is no culture of assertive self-marketing, a deeply rooted phenomenon in the regional culture. This is not only relevant in the nascent start-up ecosystem, but on a wider scale. One manifestation is that the region has many hidden industrial champions, world-class companies that are highly innovative and active in international markets, but very little known among students, the general public, or internationally. This regional culture of modesty can be seen as a strong point (it signals reliability, trustworthiness, no overselling), but can also be a handicap in an internationalising business environment where visibility is key to attract attention, talent and investments.

3.4 Supports

Under the heading of “supports”, we consider the institutions not belonging or related to a government that play the role of entrepreneurship stimulators. A large number of actors/facilities fall under this heading: physical places (hubs, accelerators, incubators, co-working spaces, science parks); supporting firms and services (accounting and law firms required to provide support to the establishment of new companies, other service providers); network organisations, that develop activities and events for start-ups and scale-ups; but also calls for tenders, innovation bootcamps, hackatons, etc.

In the Porto ecosystem, in all these categories a lot of support from entrepreneurship organisations, intermediaries and other institutions is present. For early stage start-ups, there are several incubators, of which UPTEC is the largest one. Several institutes of higher education offer support for ventures as well (more on this in the section on education). For entrepreneurs in a more developed stage, Founders Founders is an interesting initiative (a community of entrepreneurs that outgrew the incubation stage), as well as the ScaleUp Porto programme. There is a Porto Startup Scene Facebook Group, where the main events and initiatives are promoted. Overall, there is a strong and growing sense of community among the start-up scene: “the community, the peers, the incubators,... we have a complete ecosystem, it works”, says one of the start-ups we interviewed.

One thing that could be improved is communication. A lot of what is going on in Porto is not being communicated properly. One of the incubators mentioned that an overall platform is missing. Internal communication between the entrepreneurship stimulators could and should be improved.

Porto also lacks the infrastructure to host big events which tend to be held in Lisbon (the most recent example being the Web Summit). Several interviewees see opportunities to attract this type of events to Porto, but that would require a strong collaborative effort between all the organisations and institutions involved in the start-up ecosystem.

Box 3: Events, incubators, accelerators¹

Events

- **[Porto Startup Coffee](#)**: a monthly informal meetup for entrepreneurs, investors, and people interested in entrepreneurship. The idea is to have a place and time where people can have coffee or beer after work and network with interesting folks.
- **[Founders are Happy \[Hour\]](#)**: every month founders meet for drinks, snacks and talk about everything including tech and business.
- **[“Let’s Grow Again”](#)** Meetup: the marketing and growth meetup with industry experts. Learn all about growth hacking strategies and take part in the networking and Q&A sessions.
- **[Tech Tech Talk](#)**: monthly event where a particular technology is presented, followed by a Q&A or workshop.
- **[Porto Python Meetup](#)**: meetup for all Python enthusiasts in Porto.
- **[Porto WordPress Meetup](#)**: event for anyone interested in WordPress in and around Porto.
- **[OPO.js](#)**: part of the OPO.network, this is the Porto JavaScript Community, which is dedicated to all the Porto area JS aficionados.

Incubators

- **[UPTEC](#)**: UPTEC – Science and Technology Park of the University of Porto is a fundamental structure of support knowledge transfer between the university and the market, created to sustain the University of Porto’s third mission: the social and economic leverage of its generated knowledge.
- **[Porto Design Factory](#)**: a co-learning and co-creation platform, part of Politécnico do Porto, focused on educating a new generation of global innovators, responsible entrepreneurs, and future change makers, through an education program targeted at developing the skills required by the 4th industrial revolution. Porto Design Factory has developed international projects with some of the best universities in the world, like Stanford, MIT, Aalto, Nottingham Trent etc, and companies like Ford, Kone, Ikea Industry, Sonae, etc.
- **[Founders Founders](#)**: Founders Founders is a community and space for inspiring companies, entrepreneurs, biz experts, and investors brought to life by 5 start-up founders that got together to create the perfect space for their teams and other start-ups from the community.

Accelerators

- **[InRes by CMU Portugal](#)**: inRes, short for “in residence”, is a very early-stage acceleration program for entrepreneurial teams working on Information and Communication Technologies in Portugal. Organized by the Carnegie Mellon Portugal Program (CMU Portugal), funded by Fundação para a Ciência e a Tecnologia, inRes provides a training period in Portugal, followed by a seven-week structured immersion in the U.S., anchored at Carnegie Mellon University (CMU), including six weeks in Pittsburgh, and a final week in Silicon Valley. The participating teams benefit from the exposure to a highly dense environment of world-leading research groups, and market and industry specialists, in a variety of high-tech areas.
- **[Business Ignition Program](#)**: using the lean start-up approach BIP aims to build and test alternative business models for technologies developed in academia.
- **[Escola de Startups](#)**: UPTEC’s School of Startups is addressed to entrepreneurs with technology, scientific or creativity-based business projects who wish to start their own company.
- **[Beta Sound System](#)** is the first Portuguese program to accelerate new business ideas for the music industry, designed to support the work of the most brilliant artists, researchers and entrepreneurs and the most promising start-ups in the music industry.
- **[Porto Design Accelerator](#)** is the first Portuguese program to accelerate new design-based business ideas, planned to support the work of the brightest designers, engineers, researchers, entrepreneurs and promising design-driven start-ups.

3.5 Human capital

Human capital is a key asset of any entrepreneurship ecosystem. First, it links to the educational system: to what extent does it promote an entrepreneurial attitude among students; do the educational institutes run entrepreneurship courses, programmes, or incubators. A second feature is the degree to which the city and region manage to attract and retain talented individuals.

Within higher education, entrepreneurship has gained a more prominent role. The University of Porto developed UPTEC, a very successful incubator with currently 197 companies of which 120 are start-ups. More than 2000 people are involved and 51 companies “graduated” and left UPTEC. Also the Porto Design Factory is worth mentioning, offering specific entrepreneurship training. A new way of thinking has arisen, students learn by themselves and tackle challenges that come from companies. At the same time, our interviewees suggest that these are exceptions. Across the board, teaching programmes in higher education are still too traditional, and only very loosely connected to the world of business. It often depends on individual professors whether or not the connection with companies is made. Theoretical approaches are still the norm, courses focusing on entrepreneurial skills are still an exception. To quote one of our interviewees: “The education system is too far away from reality.”

Concerning talent attraction/retention, there are indications that the Porto region is on a positive swing. Interviewees note that the outmigration of graduates has stopped, thanks to vastly improving labour market conditions in the Porto region. Rather, the number of foreign students is on the rise, and among them, there is a significant number of founders of new companies. A key point raised during the interview session is that start-ups and scaleups increasingly face difficulties to recruit staff, due to competition from larger (often foreign) companies that invest in the region and lure talent. Thus, unlike in the crisis years, starting a company is not any more an option stemming from a lack of alternatives. Wages are on the rise, and for many talented graduates, a job in a bigger company is attractive. Competition has become fierce, especially for much-wanted professions such as developers, programmers and other ICT-related skills, and this poses a challenge for scale-ups. As one interviewee put it: “More talent needs to be attracted to Porto and Portugal, we don’t have enough..., we need to attract talent from abroad.” Interviewees tended to agree that for people from abroad, Porto’s image is still dominated by tourism connotations; it is not seen as a region for economic opportunity, entrepreneurship or high technology, nor as an innovative hub for education. If Porto wants to further develop as an internationally recognized entrepreneurial/tech hub, it will need more foreign talent, and work has to be done to steer the image and perception in this direction.

Meanwhile, the city is taking action, with the “Porto for talent” initiative, selling Porto as good city to live and showcasing job opportunities within start-ups and scale-ups, thus helping to attract people/talent to Porto. An important plus for the region is that English is widely spoken, especially among the younger generations.

3.6 Markets

Concerning markets, time and resources did not allow us to study in detail how the markets for which the start-ups and scale-ups work are developing. But several notions can be made.

First, there is a growing number of launching customers in the Porto region; customers that are prepared to buy from start-ups, willing to accept a somewhat higher risk factor, or even prepared to help

start-ups in the development of new concepts. Several larger firms have set up venture funds, in which they support start-ups that might become interesting partners (or profitable investments). In Porto, like anywhere in the world, we see that large firms are aware of newcomers' potential to rapidly develop new innovations and disrupt businesses. Second, the city of Porto plays a positive role as launching customer, or as facilitator of prototype testing (as happened in smart city projects, and in the case of AddVolt, where the garbage collection department tested an electric cooling system developed by the start-up).

Third, concerning access to markets, the positive development of Porto Airport, even though mainly driven by growing tourists numbers, helps companies to more easily serve clients abroad. This is important, given the region's rather limited captive market compared to ecosystems.

4. Survey results

In this section, we summarize the highlights from the survey that we conducted in Amsterdam and Porto. The results must be interpreted with caution; there were 19 respondents from Porto and 10 from Amsterdam. Nevertheless, some interesting patterns emerge.

On *internationalisation*, the Porto respondents are divided over the question if their start-up scene is internationally oriented. The Amsterdam respondents are a bit more positive on that, but not much more. This is remarkable, as Amsterdam it is generally considered as more internationally oriented.

When asked about *collaboration*, the difference is more marked; a majority of respondents in Porto agrees that more collaboration within the ecosystem is needed; In Amsterdam, this is only 25%. In both cities, about 30% of the respondents think that the growth of foreign investment has an upward pressure on the wages, and that this negatively affects the ecosystem.

Are initiatives needed *to connect start-ups better with companies in the wider region*? In both cities, 50% agrees or strongly agrees. This is an important signal for a more pronounced regional dimension in entrepreneurship policy.

Are the ecosystems *attracting start-ups from elsewhere*? In both cities, respondents think this is the case, but distinctly more so in Amsterdam (62%) than in Porto (30%).

Is the ecosystem mature? In Porto, only 10% think so; in Amsterdam this percentage is much higher (87,5%), but nobody ticked the box “completely agree”.

Finally, in both cities, respondents say that the local government in general “should do more” for the start-up scene, although this sentiment is stronger in Porto than in Amsterdam.

We asked in our survey what is missing in the current ecosystem to attract start-up investments. The following answers about Porto were returned:

- Relatable success examples.
- More start-ups with dimension to attract and fix some investors. At the same time sophisticated Portuguese investors able to attract and co-invest with international investors.
- Cooperation between actors.
- Co-working spaces and more low cost houses because the rents are extremely high due to tourism.
- Be more attractive to technological established companies that have interest in becoming part of a certain cluster.

What can the government in the Metropolitan Area Porto do to support start-up investments into the area?

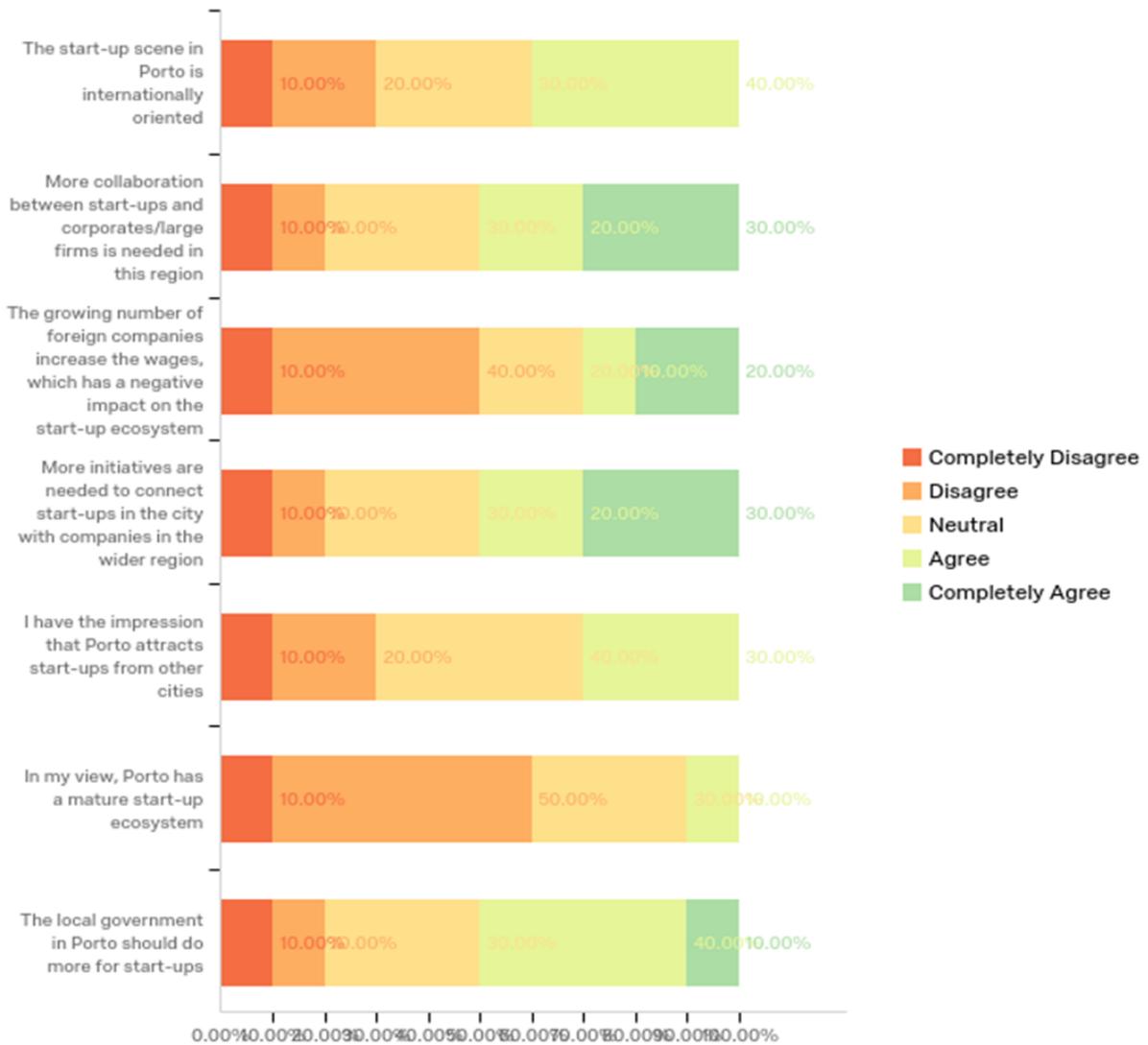
- Support co-working spaces, freelancers and creative industries. Keep the talent in the city, stop gentrification and rents from rising so young people and business can work and live in the city centre.
- Subsidize start-ups.

- Define clear criteria for an international investor who wants to co-invest in a Portuguese start-up. For example: create a(n) (online) department able to deal with these parties when they want to invest in some Portuguese start-ups in order to accelerate the deals and reduce the legal potential problems.
- Set up incubators and residential areas to support investors and students, differentiating this public from the tourist. For the most part they do not have as high a capital to live in the city as tourists.
- Increase the attractiveness to established companies that operate in areas identified with clusters.
- Have an integrated governmental policy and allocate funding helping to establish start-ups.

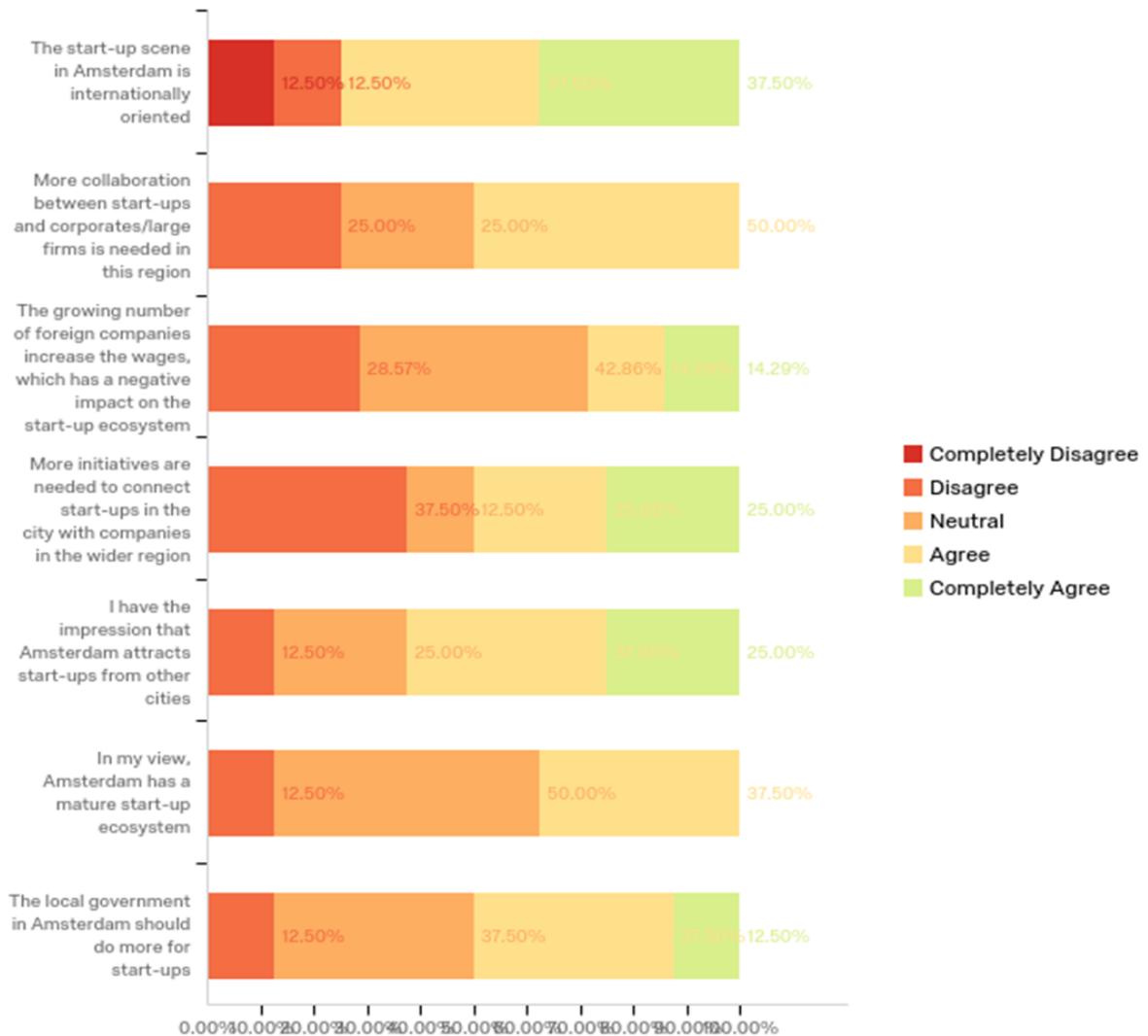
4.1 Number of respondents

#	Answer	%	Count
1	Porto	65.52%	19
2	Amsterdam	34.48%	10
	Total	100%	29

4.2 Opinions on the Porto ecosystem (from Porto respondents)



4.3 Opinions on the Amsterdam ecosystem



5. External perceptions: a social media analysis

This section summarizes the results of a social media research (full results can be found in Interim Report D1), comparing Porto to five other major metropolitan areas in Europe with regard to entrepreneurship activities. Data were collected via Web scraping and social media monitoring tools and analysed with text analysis software (e.g. to detect word frequencies and word associations). Content analysis was conducted, under supervision of senior researchers, by research assistants that are native speakers, depending on the content, and have a high level of understanding of English.

In this study, besides Porto, we analysed social media posts from 5 other metropolitan areas in Europe, namely: London, Berlin, Amsterdam, Madrid, and Lisbon. The Google search engine was used to identify stakeholders for each city. The resulting list of online weblinks to the Facebook and Twitter profile of the stakeholder was used as the input for our web scraping tool. The tool used for this is Next Analytics (for Facebook) and AUAS's own custom tool. Table 1 shows the number and type of organizations included in each city. For each organisation, for both Facebook and Twitter, our tools would scrape all posts and comments from these stakeholders from 1 January 2012 to 31 July 2017 (5.5 years period). Our study revealed a number of interesting insights into the differences between the start-up ecosystems in those cities, as well as the external perception on Porto in these cities.

In section 5.1 we characterize the online chatter in each city using wordclouds; Section 5.2 zooms in on discussions about (and mentions of) Porto in each city.

Table 5.1 Summary of organization population in each area

City	Incubator	Venture Capitalist	Angel Investors	Government Initiatives	Events
London	82	74	52	5	19
Berlin	33	26	64	3	13
Amsterdam	39	64	43	3	4
Madrid	13	3	8		4
Lisbon	19	18	4		6
Porto	72	9	2	1	8

5.1 The ecosystems compared

In this section, we present the ecosystems as wordclouds that emerge after our webcrawling exercise for each of the case cities.

London: Figure 5.1 is the output of a wordcloud analysis on the text that we have crawled from the social media pages of all organizations that we included for London. From the analysis we found out that words like 'business', 'tech', 'technology', 'digital', 'fintech' (referring to financial technology, e.g. Funding Circle, Transfer Wise) dominate the conversations. This indicate a synchronous relationship between the image of London and the entrepreneurship effort of the city. Another thing that is noticeable from the online chatter is that despite of the number of highly ranked (educational) institutions in

Lisbon: Within the period of our research, we found 113 posts in Facebook and 13 posts in Twitter about Porto in Lisbon. The posts are about entrepreneurship institutions and events held in Porto, such as Anje, Startupplx, Websummit, and Startup-clinic.

5.3 Conclusions

The results presented above must be interpreted with caution. But some conclusions can be derived. First, the study reveals that the volume of online chatter in Porto relatively low (only Madrid is lower), and it has the lowest online activity per organization. Considering that the growth of an entrepreneurship ecosystem is fuelled by the availability of information, institutions in Porto could be encouraged to be more actively engaged in the social media.

Another aspect identified in the social media analysis is that the cities of London, Berlin, Amsterdam, and Lisbon, major “themes” can be identified that characterize their ecosystems. The themes are summarized by means of the most frequently mentioned words, in Table 5.3. For example, Lisbon has a theme centred on technology and tourism, while the city of Amsterdam is centred on smart and sustainable city. Tourism and sustainability are unique themes selected by these cities, which are different from larger cities, such as London and Berlin which are both centred towards Finance and Technology. Unlike in the other cities, the names of the institutions are the ‘themes’ that dominate the online conversations. This indicates that while there are strong institutions in Porto, they seem to advance their individual agenda and prestige, rather than the metropolitan area.

The last aspect that we notice from the social media analysis is that the online chatter is mainly in Portuguese, which may create a barrier for entrepreneur from outside of the Portuguese speaking community to enter the conversation.

Table 5.3 Most frequently mentioned words

Word	Porto	Lisbon	Amsterdam	Berlin	Madrid	London
The city	1	2	2	3	1	8
The country	3	2	79	91	error	error
Fintech	error	error	110	49	error	57
IOT	error	error	469	88	error	133
tech	104	16	53	19	78	11
design	99	113	50	66	error	236
green	error	error	52	error	error	error
smart	error	error	69	127	error	211
international	189	237	120	116	error	119
venture	57	20	144	79	51	68
tourism	error	167	error	error	error	error
circular	error	error	11	error	error	error

6. Conclusions: Towards a roadmap

This final section, based on the analysis of the previous sections, provides some hints of a further developments of the AMP towards a full-fledged international entrepreneurship ecosystem that is connected with the traditional industrial strengths of the region. The conclusions presented here are also derived from a workshop held in Porto on 25 April, during which we discussed preliminary findings of the social media analysis, the qualitative study and the survey, with a number of stakeholders from the region.

Our study shows that the ecosystem of the AMP is moving into a more mature stage. Entrepreneurship activity is growing, a lively start-up scene has developed in the city of Porto, and a growing number of them are active on international markets. At the same time, several problems and challenges remain. In (higher) education, there is room for improvement when it comes to facilitating entrepreneurship and, broader, to link education with business practice. When it comes to finance, Porto still lacks a local/regional VC scene or serial entrepreneurs, and still depends to a large extent on public funding and far-away investors. In terms of marketing and communication, actors in the Porto system could do a better job in selling successes and speak out louder about the qualities of the local system. This is also reflected in the social network analysis, that showed that Porto actors communicate substantially less via social media than their counterparts in other metropolitan areas.

6.1 Where does the wider region fit in the picture?

Most start-up activity takes place in the urban core of Porto. As one interviewee said it: “Everything is centre focused, only a few things happen outside.” But the wider region plays a role in various ways. Because of the booming economy, the city is becoming more expensive. Tourism is booming, real estate prices and office rents go up, there is more traffic congestion, and restaurants, parking and other facilities are becoming more expensive. This is having an impact on the ability of start-ups to find affordable working space. UPTEC is full, and some of our interviewees indicate that it is harder to find a place in town for start-ups. Thus, it might be expected that the surrounding region is becoming more attractive for start-ups because prices are lower. A key point here is access to public transport: start-ups tend to have young employees who often do not own a car. This implies that municipalities in the region that want to develop as start-up hubs must select locations that are well accessible by public transport.

The region is also important as a location for fast-growing start-ups that outgrow their Porto offices and need more space. Typically, in their early days, start-ups want to be close to universities, and only need small offices. When they get bigger they will expand and go to offices outside the small area of Porto centre.

There are many innovative and internationally oriented industrial firms in the North, but they are relatively unknown by students, start-ups and the general public. Therefore, most initiatives go in the direction of well known (international) firms rather than these “hidden champions”, and opportunities are lost. Nevertheless, there are several programmes that try to bridge the Porto entrepreneurship scene with the regional industry.

UPTEC already links Porto start-ups with regional companies through their “Industry at UPTEC” programme; twice a month, they invite a company from the North to UPTEC to present a particular

technology or business challenge to an audience of students and start-ups. After that, a call is opened, start-ups and students can meet with the firm, and explore if they can find a match and deliver a solution. The experience of the Porto Design Factory – the educational programme in which students develop innovations for firms – shows that there is a large interest of the regional industry to work on innovation with student teams: 40% of the companies they work with are SMEs (small and medium-sized enterprises) from the region, many of them in the field of manufacturing. The “Ange” program picks 20 tech companies and industries, mainly targeting start-ups, to mix them with traditional industry, 6 master classes, to bridging the gap, to bring them to the ecosystem as well. It also gives exposure to the industry.

Governmental organisations can play a role too. We have seen that the City of Porto has played a positive role for start-ups enabling them to test new products (i.e. the cities’ waste department agreed to test an electric cooling system on their vehicles; the city is also engaged in projects of the Design Factory). A similar role could be played by the AMP, or by its constituent municipalities.

Another opportunity lies in the recent acceleration initiative by UPTEC to tackle social challenges in a more entrepreneurial way. Organisations can bring in social challenges, and then a team of PhDs, tech enthusiasts, students and others work on that problem for one week and develop solutions. Here again, the AMP and its municipalities could participate actively by submitting challenges.

6.2 Is there a role for regional policy from AMP to promote the entrepreneurship ecosystem?

Again, so far, the start-up ecosystem is mainly located in the central parts of the city of Porto and the university campus. Here are the incubators, the events, and the dynamics of the system. Around Porto there are also small pockets of start-ups activity but the scale is relatively small. Start-ups prefer the denser urbanised areas for their more dynamic feel, and the availability of public transport connections (important for young people who cannot afford a car). At the same time, the localised Porto system is connected to the wider region in many ways. We found interesting and promising cases of developing business relations between start-ups and industrial players in the wider industrial surroundings of the city. The region has a number of sophisticated industrial companies (often little known by the general public) that serve international markets, deploy state-of-the-art technology, and work in a very competitive and dynamic environment. Several initiatives have been taken, mainly by the university incubator, to develop more fruitful links between these firms and start-ups.

During our roadmapping session with stakeholders, it was concluded that more might be done to connect the regional industry with the start-up scene. This would benefit both sides: start-ups could gain clients, capital and knowledge: they may learn a lot from the operational knowledge and business experience of industry firms; At the same time, industry might benefit from the infusion of fresh thinking, new ideas and new technologies of start-ups. Some models are worth trying, for example the “entrepreneur in residence” model, in which a start-up entrepreneur is stationed in an industrial company for a certain period of time.

In the workshop, it was concluded that specific entrepreneurship policy on the level of the AMP should not be a priority. The start-up scene is booming, and there are already many supporting initiatives from different layers of government.

A key role of the AMP lies rather in the field of spatial planning and public transport, to further facilitate the development and integration of the system. The most important barrier is the regional transport system. Participants in the meeting argued that public transport connecting Porto with the region falls short, making it very time consuming to travel between downtown Porto and industrial areas in the region for people who do not own a car. This situation seriously hampers a stronger integration of the industrial tissue with the start-up ecosystem. Moreover, and in a broader perspective, the participants argued that the findings of our study are another argument to develop a coherent and integrated economic strategy for the region as a whole. Porto's startup scene and the regional industry must be treated as interdependent entities, and connections should be facilitated.

Also, we concluded that it is probably not very fruitful to embark on explicit image or awareness campaigns to "sell" the AMP as entrepreneurial region where start-ups and industry reinforce each other. Our study reveals that currently, Porto's start-up ecosystem is not mentioned very much in major cities in Europe. This could be seen as an indication that the external perception of Porto as start-up hub is marginal, and it is tempting to design marketing and branding activities to somehow address this. It is questionable however how effective such a strategy would be, given the limited mobility of international start-ups and the very limited capacity of (public) actors to change the perception of so many players in so many urban areas in Europe and beyond. The participants of the meeting agreed that it would be more effective to build further on the current strengths in de region, do (or support) more concrete projects to interconnect start-ups and entrepreneurship education with industry. The image or external perception than follows this reality, slowly perhaps, but surely. It could be an avenue for further research to find out how other (industrial) regions are dealing with this challenge.

Annex 1 Interviewed stakeholders

AddVolt – Bruno Azevedo

UPTEC – Clara Gonçalves

STARTUP X – Rafael Pires

Porto Design Factory – Diogo Pinto and Rui Coutinho

Founders Founders – Paulo Cunha

Beta Capital – Sofia Monteiro

Metropolitan Area of Porto – Pedro Figueiredo

10K incubator Amsterdam University of Applied Sciences – Martin Haring

Measuremen – Justin van Wel

Start-up Amsterdam – Eline Vliegen

Start-up Village – Erik Boer

Van Plestik – Nout Kooij

Startup in Residence – Toon Branbergen

Annex 2 Surveys

Survey Porto

(Likert scale 1-5)

The start-up scene in Porto is internationally oriented

More collaboration between start-ups and corporates/large firms is needed in this region

The growing number of foreign companies increases the wages, which has a negative impact on the start-up ecosystem

More initiatives are needed to connect start-ups in the city with companies in the wider region

I have the impression that Porto attracts start-ups from other cities

In my view, Porto has a mature start-up ecosystem

What is missing? (open question)

The local government should do more for start-ups

What are your suggestions? (open question)

Survey Amsterdam

The start-up scene in Amsterdam is internationally oriented

More collaboration between start-ups and corporates/large firms is needed in this region

The growing number of foreign companies increases the wages, which has a negative impact on the start-up ecosystem

More initiatives are needed to connect start-ups in the city with companies in the wider region

I have the impression that Amsterdam attracts start-ups from other cities

In my view, Amsterdam has a mature start-up ecosystem

What is missing? (open question)

The local government should do more for start-ups

What are your suggestions? (open question)